Master Catalog

2016-2017

Enabling Connectivity for the Industrial Internet of Things

• Edge Connectivity • Industrial Computing • Network Infrastructure

MOXA®

Reliable Networks ▲ Sincere Service

Moxa: Your Trusted Partner in Automation

As the Industrial Internet of Things (IoT) interconnects our world faster than ever, we rely more than ever on network infrastructures. Since its establishment in 1987, Moxa has had a proven track record of providing customers with the most reliable networks for a variety of industrial applications.

With over 25 years of industry experience, Moxa has connected more than 40 million devices worldwide. These devices have delivered highly reliable communications between people, systems, and processes to achieve all forms of automation and collaboration.

Promise for the Future

Reliable Networks, Sincere Service continues to be Moxa's promise to enable connectivity for the Industrial IoT. Moxa stays ahead of the curve with innovative Ethernet-core technology and solutions to help customers tap into the potential of the Industrial IoT market.

Reliable Networks

Network reliability is the cornerstone of Moxa's commitment to deliver the best value to our customers and partners. Moxa's many solutions share a common set of robust features designed to provide maximum network uptime, especially in harsh environments. Our cutting-edge product portfolio comprises quality and innovative technology to ensure nonstop productivity, operational efficiency, and robust security for complex industrial communications and automation applications.

Sincere Service

At Moxa, we listen carefully to learn more about our customers' expectations and needs before we develop a solution. With extensive experience and innovative technology, we provide premium customization, expert network consulting, and a broad range of technical support services. Through close collaboration with our worldwide partners, we help customers optimize their applications' performance, adapt to fast-changing technologies, and seize opportunities to achieve the best time-to-market results.

Product Offerings

Edge Connectivity

Moxa's edge connectivity products bridge various industrial devices to streamline the acquisition and transmission of data, voice, and video to backbone networks. Customers can enjoy seamless network integration for various cross-system collaborations.

- Serial connectivity
- Industrial Ethernet gateways
- RTU controllers and smart I/O devices
- Industrial IP cameras and video management software

Industrial Computing

Moxa provides RISC- and x86-based industrial computers to work in the most demanding conditions. The world's first wide-temperature-range 4G LTE computer is a perfect example of a device that delivers reliable 4G performance without requiring a fan or a heater.

- Mission-critical computers
- Displays and panel computers
- Compact and wireless computers
- Embedded CPU modules

Network Infrastructure

Moxa's network infrastructure solutions provide comprehensive building blocks to develop robust wired and wireless backbones for mission-critical applications with regard to device reliability, connection availability, cybersecurity, and easy management.

- Industrial Ethernet switches
- Industrial wireless AP/bridge/client and cellular routers
- Industrial secure routers
- Ethernet media converters
- Network management software

Get Connected to Success and Opportunity

Worldwide, Moxa's expert sales team is ready to provide the best quality, support, and services to assist you in all aspects of your projects—from concept to completion—to empower your network operations and applications.

Global Service Coverage

Customer-Oriented Service

Moxa has established a global service network to be closer to our customers to better understand their needs and respond faster to their requirements. Leveraging Moxa's industrial experiences and technological intelligence, our service team provides professional solutions and consulting services, backed by our extensive global resources and solution capabilities.

Extended Teamwork

Through our annual MTSC (Moxa Technical Support Certification) training, Moxa provides the most up-to-date solutions and technologies to our global partners to ensure the best service to customers. Integrating the strengths of our worldwide industry and technology partners, we deliver sincere service and an extended range of innovative solutions to customers.

Total Quality Management

Our commitment to quality is at the heart of Moxa's promise of *Reliable Networks, Sincere Service.* Moxa employs a corporate-wide Total Quality Management System (TQMS) to achieve customer satisfaction and unbeatable results in the following categories:

Robust Technology

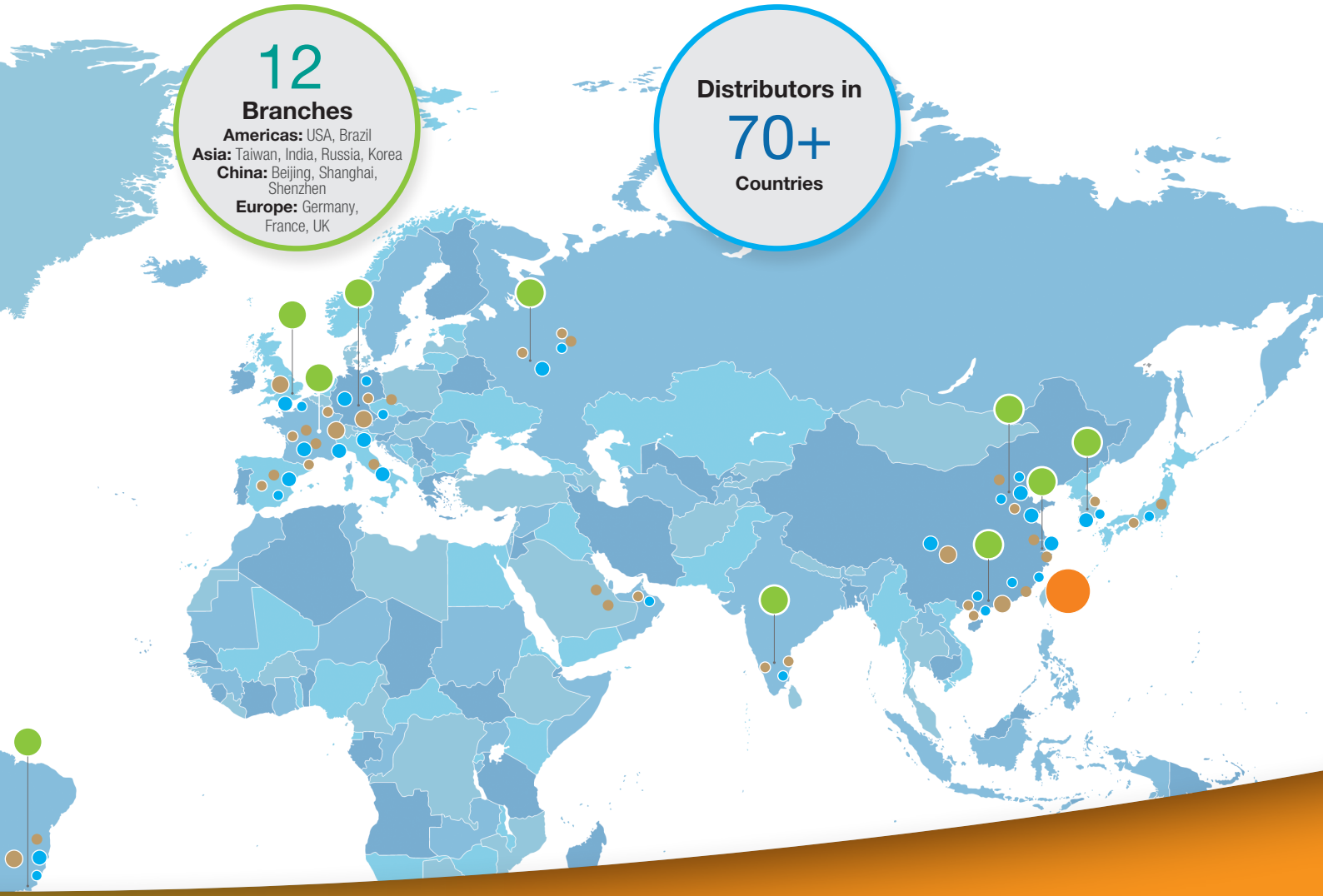
At Moxa, quality starts with concepts that benefit our partners and customers. Moxa attracts a broad spectrum of talent and encourages new ideas to nurture innovation at every level. Following the well-defined New Product Development Process (NPDP), all of Moxa's products must undergo strict tests, verifications, and validations to achieve tangible quality-related benchmarks for various industrial applications.

Project Life-Cycle Management

Moxa is IRIS-certified and implements a rigorous management process to ensure quality and optimal results for long-term projects. Specific RAMS and LCC management guidelines guarantee reliability, longevity, low life-cycle costs, and easy maintenance throughout a project's lifetime.

Continuous Improvement

Moxa motivates each employee to work smarter and find ways for continuous improvement. Our Quality Improvement Team (QIT) and Eight Disciplines Problem-Solving (8D) methodology for solving problems and preventing crises promote continuous progress in the quality of our products, service, and technology, to ensure customer satisfaction.



Technological Innovation

Moxa cultivates continuous technological innovation to meet the constantly changing requirements of industrial environments. To enable the most capable and reliable connectivity required for the Industrial IoT, Moxa strives to achieve application-driven innovations in the following aspects.

■ Performance
High-speed wired/wireless connectivity for future-proof networks

■ Reliability
Proven reliability for continuous productivity

■ Availability
Millisecond-level redundancy for nonstop operations

■ Security
Industrial cybersecurity for critical device protection and secure remote access

■ Manageability
Easy operations in deployment, monitoring, and diagnostics maintenance

■ Interoperability
Leading legacy and versatile fieldbus technologies for seamless automation communication

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Enabling Connectivity for the Industrial Internet of Things

Moxa's industrial network and automation solutions are ready to take connectivity to new frontiers. With a forecast of more than 50 billion devices connected worldwide by 2020, Moxa focuses on connectivity enablement to expand communication and collaboration between various devices, technologies, and people.

Edge Connectivity

Serial/Fieldbus Connectivity

Serial or fieldbus connectivity bridges legacy, fieldbus, and Ethernet devices to reap the benefits of legacy-to-IP communications and operational efficiency.

I/O Connectivity

Industrial I/Os and controllers enable faster data transfer and SCADA response, as well as programming-free logic control.

Video Connectivity

Extreme weather IP cameras activate 360-degree HD surveillance for extreme applications.

Smart Value for Your Applications

Through our fully converged communication solutions, Moxa helps customers build remote control and monitoring networks suited for highly automated industrial operations and demanding public-safety applications.

Powering Productivity

Our cutting-edge product portfolio delivers superior performance thanks to high bandwidth, reliability, availability, and interoperability in mixed-protocol and legacy environments.

- High-speed transmission
- Maximum uptime and availability
- Video always-on networking
- Reliable mobile communications
- Industry-proven reliability
- Legacy compatibility
- Protocol interoperability

Optimizing Operational Efficiency

Moxa's extensive software solutions are the key to operational efficiency, including intuitive management software for operations that are faster and less error-prone, as well as an API platform for faster development and ease-of-use.

- Faster deployment
- Visualized management
- Easier troubleshooting
- Preventive maintenance
- APIs for easy application deployment
- Seamless integration with SCADA systems

Strengthening Security

A convergence of cybersecurity and physical security systems forge a reinforced network to ensure the full protection of control systems and staff safety in industrial applications.

- Device security with authentication, integrity, and firewall protection
- Secure remote access with IPSec, L2TP, or OpenVPN encryption
- IEC 62443 standard compliance *(Available in Q4, 2016)*
- Industrial-grade IP surveillance systems

Factory Automation

Moxa's factory automation solutions are designed to drive productivity and cost reduction through network convergence from the edge to the core. The solutions deliver optimized process integration and automation-friendly management to improve throughput and performance.

Industrial Computing

Industrial Computers

Embedded computers enable seamless data aggregation, analytics, and reporting from the extreme edge to the cloud/core.

Network Infrastructure

Industrial Ethernet

Industrial Wireless

Industrial Ethernet and WLAN solutions offer leading performance, availability, and reliability to achieve maximum uptime and efficiency for wired and wireless connectivity.

Industrial Routers

Industrial secure and cellular routers enable asset protection and secure access across public networks.

Management

IA-friendly device management and network management address easy deployment, supervision, troubleshooting, and seamless collaboration with SCADA and third-party platforms.

Railway Automation

Moxa's IRIS-certified railway solutions come with the top-notch service, quality, and commitment that industrial customers demand. Moxa's railway solutions deliver EN 50155-compliant control and communications between train, ground, and trackside to ensure safety and uninterrupted passenger services.

Power Automation

Moxa has delivered solutions in more than 300 successful substation networking and computing applications. Moxa's solutions ensure GOOSE compliance and zero-packet-loss performance in compliance with IEC 61850-3 and IEEE 1613 standards.

Oil and Gas Automation

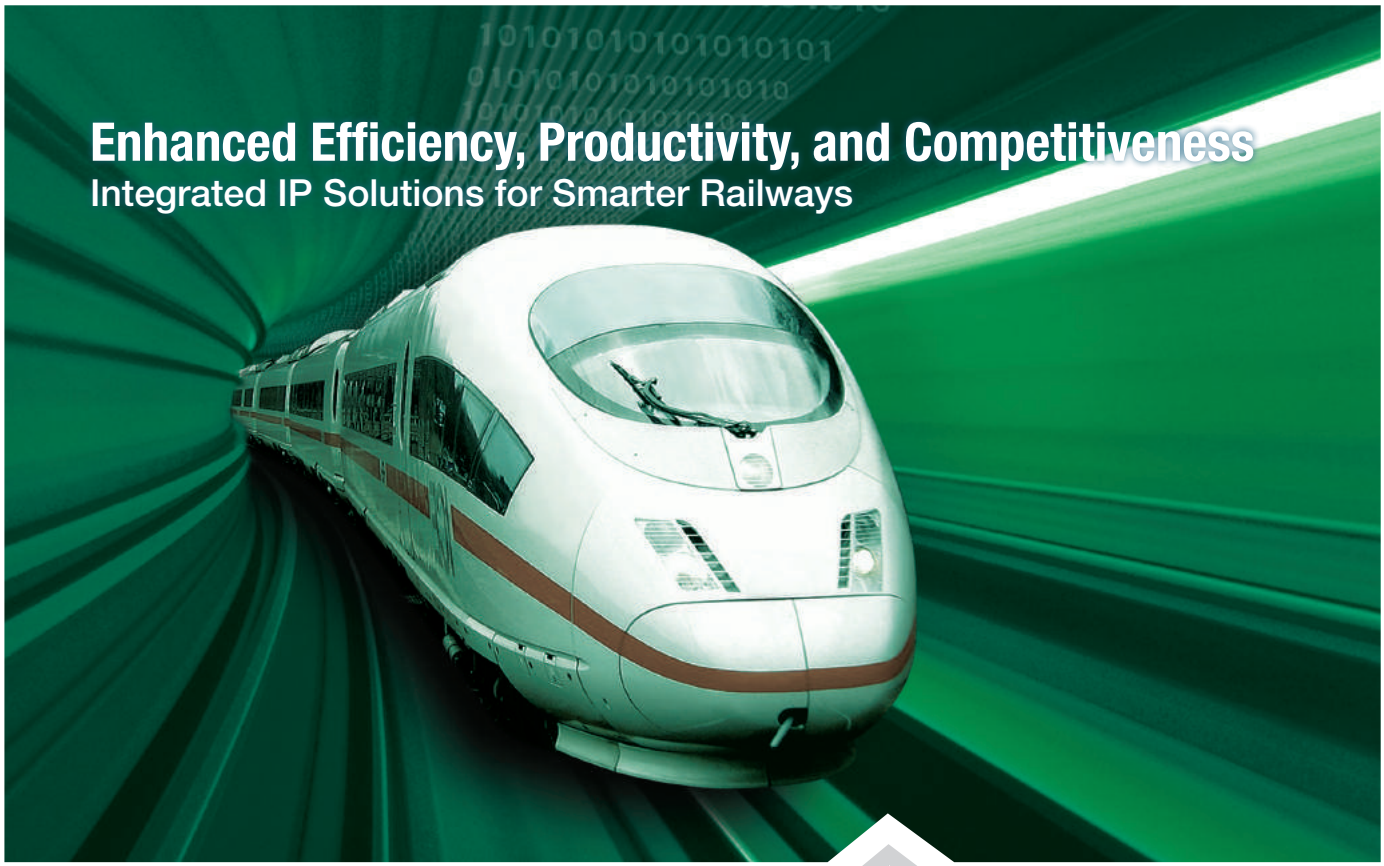
Moxa's oil and gas automation solutions comply with UL Class 1 Division 2, ATEX Zone 2, and IECEx standards, allowing customers to achieve maximum uptime and improved productivity with our oil and gas networking, monitoring, and computing solution portfolio.

Marine Automation

Moxa's marine solutions, compliant with all major maritime certifications, offer a wide range of marine-grade industrial Ethernet and computer products that ensure long-lasting and reliable operations in the challenging environments experienced by ship, offshore oil and gas, and windmill applications.

Intelligent Transportation Systems

Moxa's ITS solutions combine high-bandwidth networks and HD IP video solutions to ensure fast information convergence and nonstop operational continuity, allowing traffic control managers to make decisions quickly in the event of road traffic emergencies.



IRIS-Certified Rail Solutions Verified for Maximum Quality

Moxa is an IRIS-certified global leader in a wide range of IP-based communications solutions. Now, Moxa is contributing its networking expertise to the railway industry through membership in IEC railway committees. Railway operators world-wide have discovered new operational efficiencies by deploying Moxa's unique time and cost-saving railway technologies. By designing for a long MTBF, owning all the core component IPs, and building long-term partnerships, Moxa helps railway integrators create sustainable solutions with low life-cycle costs for passenger comfort and railway operation networks.

Application Focus

- Passenger-oriented service (e.g., onboard Wi-Fi, passenger information systems)
- Railway CCTV
- CBTC (Communication-Based Train Control)
- Wayside data communications systems

Leading Technologies

- Turbo Ring and Turbo Chain: Advanced Ethernet redundancy solutions
- Turbo Roaming: Fast and secure train-to-ground wireless communications
- ACC: Intelligent wireless inter-carriage links
- FLI: Flexible, location-based, intelligent industrial-grade auto-configuration technology

IRIS Certification

Visit www.moxa.com/rail

ACC Auto Carriage Connection FLI Industrial Auto Configuration EN 50155 EN 50121

ToughNet, EDS Series
Industrial Ethernet Switches
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TAP, AWK-RCC/RTG Series
Industrial Wireless AP/Bridge/Client
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NPort 5000AI-M12 Series
RS-232/422/485 Serial Device Servers
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TC-6000, V2000 Series
Industrial Embedded Computers
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VPort Series
Industrial IP Cameras
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ioPAC Series
Industrial RTU Controllers
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ioLogik E1500 Series
Remote I/Os
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Connect to the Smart Grid Today

End-to-End Networking and Computing Solutions for the Power Industry

Many Successful Deployments in Power Projects Worldwide

Create rock-solid and future-proof power networks by partnering with Moxa. Moxa is a Collective Member of CIGRE and has delivered solutions in over 500 successful substation transmission and distribution networking and computing applications around the world. Moxa is now the leading solar energy monitoring supplier in North America with many diverse projects in advanced metering infrastructures worldwide. You can rely on our expertise of more than 25 years in proven solutions in the following industry applications.

Application Focus

- Solar power
- Wind power
- IEC 61850 transmission and distribution substation
- Advanced metering infrastructure

Leading Technologies

- Industry's first IEC 61850 switch with MMS data modeling: SNMP/MMS management with integrated network monitoring solutions for power substation SCADA
- Industry's first integrated PRP/HSR redundancy box for zero recovery time
- Turbo Chain: Different redundant networks can be extended without any ring coupling effort
- Patented computing platform for heat dissipation with wide temperature tolerance
- ThingsPro: Asset management for solar energy monitoring

Visit www.moxa.com/SmartGrid

Turbo Chain | PRP HSR | IEEE 1613 | ThingsPro

PT-7528 Series
IEC 61850 28-port IEEE 1613 Class 2 Managed Ethernet Switches
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PT-7728-PTP Series
IEC 61850 14-port IEEE 1588v2 Managed PRP/HSR Switches
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PT-G503-PHR-PTP Series
IEC 61850 3-port Full Gigabit Managed PRP/HSR Redundancy Boxes
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DA-820 Series
x86 IEC 61850-3 Certified i7 Rackmount Computers
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NPort S8000 Series
Combo Switches / Serial Device Servers
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UC-8100 Series
RISC Energy Monitoring Computers
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ioLogik E1200 Series
Compact Ethernet Remote I/O
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DCU-8620-T Series
Data Concentration Units
▶Available by request

Proven Solutions for the Harshest Oil & Gas Environments

Integrated Networking, Monitoring, and Computing Systems

Your Trusted Partner in Oil & Gas Automation

Moxa is a leading provider of industrial automation solutions and has proven experience in providing networking equipment and service suitable for the harshest oil & gas environments. Moxa's industrial-grade products and well respected technology enable efficient remote monitoring and easy asset management, delivering business value to customers all over the world. To assure the highest level of safety, the computing, networking, and automation products Moxa develops especially for use in oil & gas facilities meet important global certifications, including ATEX Zone 2, Class 1 Division 2, and IECEx.

Application Focus

- Offshore oil drilling control systems
- Onshore drilling / wellhead monitoring
- Pump stations and pipeline monitoring
- Oil refining and gas station operations

Leading Technologies

- Turbo Ring and Turbo Chain: Unrivaled network redundancy solutions with 20 ms recovery
- Dual-Radio and Turbo Roaming: Zero packet loss and millisecond-level wireless roaming
- ISA99/IEC 62443 compliant for industrial security: Layered cybersecurity solution with innovative PacketGuard™ for Modbus TCP deep packet inspection
- World-leading panel computer design: 1000-nit LCD, glove-friendly multi-touch, system bootup within 3 minutes, -40 to 70°C operating temperature without heater
- MXview, MXview ToGo, QuickLink, MX-AOPC UA Server: Efficient network management by smart visualization, automated configuration, and seamless integration with SCADA systems

Visit www.moxa.com/Solutions/Oil_and_gas

EDS/IKS/ICS Series

Edge-to-Core Ethernet Switches

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EDR Series

VPN/Firewall Secure Routers

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AWK Series

IEEE 802.11a/b/g/n Wireless AP/Bridge/Client

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MGate and NPort Series

Industrial Gateways and Device Servers

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ICF Series

Industrial Serial/PROFIBUS-to Fiber Converters

▶Page 14-32

ioLogik 2500 Series and ioLogik E1200 Series

Smart Remote I/O and Ethernet Remote I/O

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VPort Series

HD IP Cameras

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EXPC-1519 Series

Zone 2 Panel Computers

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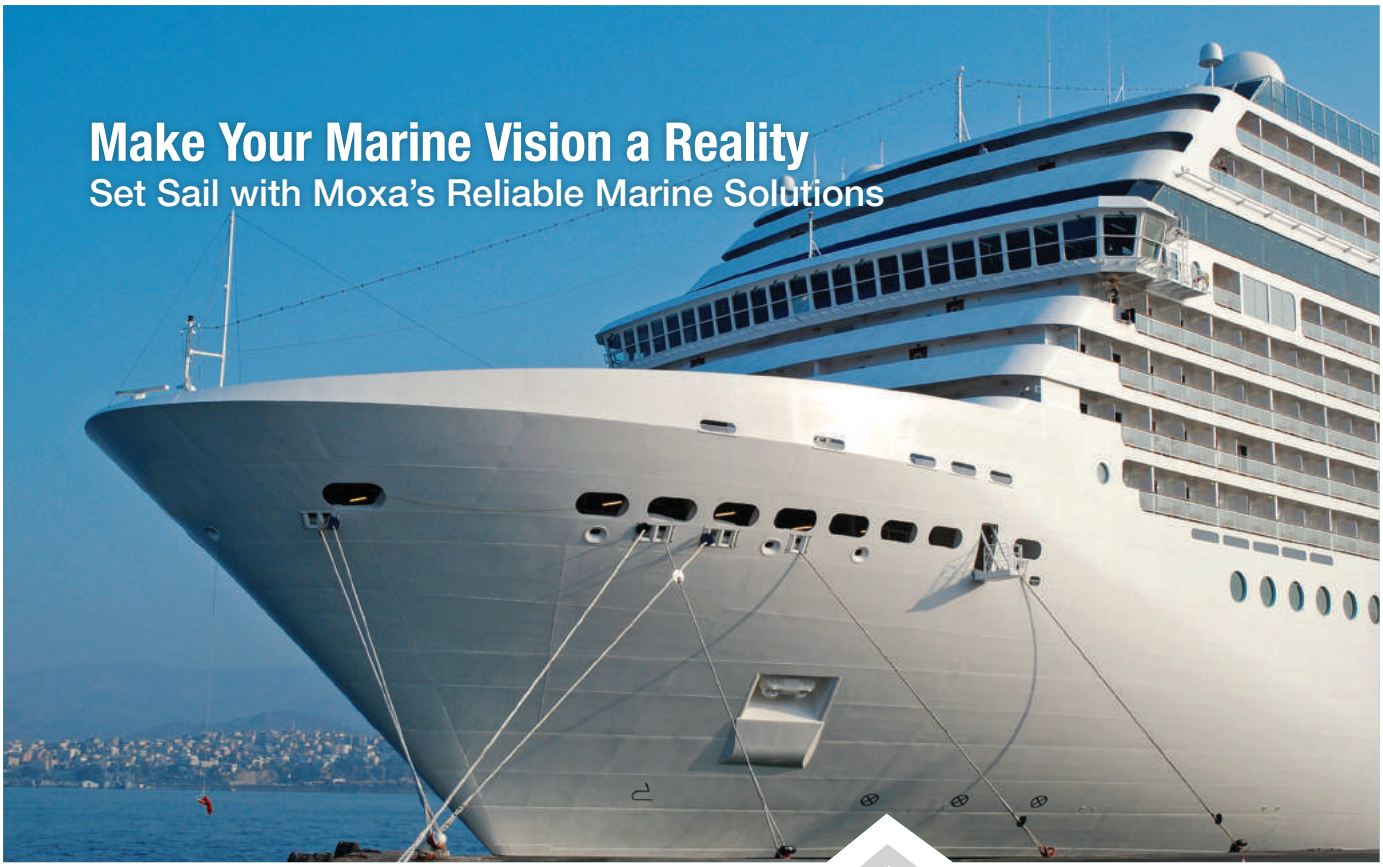

Make Your Marine Vision a Reality

Set Sail with Moxa's Reliable Marine Solutions

Successful Deployment of Integrated Marine Bridge Solutions Worldwide

Moxa provides maritime professionals with industrial-grade marine computers, panel PCs, displays, and Ethernet switches that use leading technologies and reliable designs perfect for applications on docks, marine bridges, open decks, and in control rooms.

Moxa's marine solutions pass strict tests and follow critical industrial standards to ensure compliance with international marine standards, including DNV, ABS, GL, LR, IEC 60945, IEC 61174, IEC 61162, and IACS E10, making Moxa's marine solutions the best option for marine applications.

Application Focus

- Electronic Chart Display and Information System (ECDIS)
- Radar System
- Integrated Navigation System (INS)
- Integrated Platform Management System (IPMS)

Leading Technologies

- Advanced ECDIS color calibration technology: more consistent color rendering for a longer period of use
- Customer initiated smart OSD design: Off-Screen-Display control allows users to easily control the monitor in low light environments
- High performance computing power in a fanless design enhances computers' reliability and reduces customers' maintenance costs

Visit www.moxa.com/marine

MPC-2150/2190/2240/2260 Series
Marine Panel Computers
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MD-219/224/226 Series
Marine Displays
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MC-7200 Series
Marine ECDIS Computers
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MGate 5101-PBM-MN Series
PROFIBUS-to-Modbus TCP Gateways
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ioLogik E1200H Series
Ethernet Remote I/O
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EDS-408A Series
Managed Ethernet Switches
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Your Trusted Partner for Factory Automation

To help manufacturers maximize the benefits of integrating network and automation technology, Moxa has focused on the factory automation market for over 26 years. Moxa provides leading solutions for industrial communications, including wired and wireless infrastructures, industrial computing, remote monitoring, and video surveillance.

Application Focus

- SCADA
- Control system networks
- Wireless infrastructures and machine-to-machine communication
- Packaging equipment
- Cybersecurity
- Industrial video surveillance
- Material handling

Main Benefits

Reliability

- Industry leading communication redundancy for < 20 ms recovery time
- Unique thermal design that supports fanless wide temperature operation (-40 to 75°C)
- High level EMI/EMC shielding
- Redundant power supply with isolation protection
- Continual improvement of total quality management
- ISO 9001 quality management standard recognized

Ease of Integration

- User-friendly network and device management software
- Serial, Ethernet, I/O, and wireless solutions integrated into a single network
- Quick mass configuration tool for 90% time savings (with up to 100 switches)
- OPC server for cost-effective SCADA integration

Global Support

- Access to products and support in over 70 countries
- Customization service

VPort Series
Industrial IP Cameras
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EDS Series
Industrial Ethernet Switches
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MGate Series
Industrial Ethernet Gateways
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NPort Series
Serial-to-Ethernet Device Servers
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ioLogik 2500-WL1 Series
Smart Wireless I/O
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EDR-810 Series
Industrial 8+2G Multiport Secure Routers
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AWK-A Series
Industrial Wireless AP/Bridge/Client
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Integrated Network Solutions for Intelligent Transportation

Real-Time Convergence for Non-Stop Safety

Today more than ever before, roadway safety and efficiency depend on real-time information and communication. To increase traffic flow, reduce congestion, and improve incident response times, Moxa's industrial Ethernet solutions facilitate real-time convergence of various sensor data, voice, and video by providing high-speed throughputs and a wide range of network devices. All of these devices emphasize extreme reliability, smart redundancy, easy manageability, and a lower total cost of ownership.

Application Focus

- Advanced Transportation Management Systems
- Tunnels
- Intelligent E-Bus
- Electronic Toll Collection (ETC)

Leading Technologies

High Bandwidth

- 1GbE/10GbE switching and routing
- Up to 500 Mbps router throughput
- Up to 300 Mbps wireless transmission
- Up to 150 Mbps VPN traffic

Extreme Reliability

- Turbo Ring and Turbo Chain self-recovery (< 20 ms @ 250 switches)
- V-ON network redundancy under 50 ms for mission-critical IP surveillance
- Turbo Roaming with millisecond-level handoff times for seamless mobility

Efficient Management

- MXstudio network management suite for installation, operation, maintenance, and diagnostics
- OnCell Central Manager for remote cellular device management
- IP surveillance software solutions for easy SCADA surveillance

Visit www.moxa.com/ITS

ICS Series
Industrial 10GbE Ethernet Switches
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AWK-A Series
Industrial 802.11n AP/Bridge/Client
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EDS-G512E-8PoE
8-port PoE+ Full Gigabit Managed Switch
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VPort Series
Industrial HD IP Cameras
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IEX-408E-2VDSL2 Series
Copper Extender Switches
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NPort IA5000A Series
2-Port Industrial Serial Device Servers
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MXstudio
Industrial Network Management Suite
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Industrial Ethernet Switches

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Embrace Edge-to-Core Industrial Ethernet Infrastructure 1-9

Rackmount Ethernet Switches

ICS-G7748A/G7750A/G7752A/G7848A/G7850A/G7852A Series: 48G/48G+2 10GbE/48G+4 10GbE-port Layer 2 / Layer 3 full Gigabit modular managed Ethernet switches 1-12
IM-G7000A Series: 4G-port Gigabit Ethernet interface modules for ICS-G7700A/G7800A series modular managed switches 1-15
ICS-G7526A/G7528A/G7826A/G7828A Series: 24G+2 10GbE/24G+4 10GbE-port Layer 2 / Layer 3 full Gigabit managed Ethernet switches 1-16
IKS-G6524A/G6824A Series: 24G-port Layer 2 / Layer 3 full Gigabit managed Ethernet switches 1-19
IKS-6726A/6728A Series: 24+2G/24+4G-port Gigabit modular managed Ethernet switches 1-22
IM-6700A Series: Fast Ethernet modules for IKS-6726A-2GTXSFP/IKS-6728A-4GTXSFP series switches 1-25

DIN-Rail Ethernet Switches

EDS-728/828: 24+4G port Layer 2 / Layer 3 Gigabit modular managed Ethernet switches 1-27
IM Series: 2-port Gigabit Ethernet and 4-port Fast Ethernet interface modules for EDS-728/828 series Ethernet switches . 1-29
EDS-608/611/616/619 Series: 8, 8+3G, 16, 16+3G-port compact modular managed Ethernet switches 1-31
CM-600 Series: 4-port Fast Ethernet interface modules for EDS-600 series Ethernet switches 1-34
EDS-G508E/G512E/G516E Series: 8G/12G/16G-port full Gigabit managed Ethernet switches 1-35
EDS-G509 Series: 9G-port full Gigabit managed Ethernet switches 1-37
EDS-518E Series: 16+2G-port Gigabit managed Ethernet switches 1-39
EDS-510E Series: 7+3G-port Gigabit managed Ethernet switches 1-41
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EDS-405A/408A Series: 5 and 8-port entry-level managed Ethernet switches 1-46
EDS-405A-PTP Series: 5 and 8-port entry-level managed Ethernet switches 1-48
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EDS-210A Series: 8+2G/9+1G-port Gigabit unmanaged Ethernet switches 1-55
EDS-205A/208A Series: 5 and 8-port unmanaged Ethernet switches 1-57
EDS-205/208 Series: 5 and 8-port entry-level unmanaged Ethernet switches 1-59

PoE Switches

IKS-6728A-8PoE Series: 24+4G-port Gigabit modular managed PoE+ Ethernet switches 1-61
EDS-G512E-8PoE-4GSFP Series: 9G-port full Gigabit managed Ethernet switches 1-64
EDS-P510A-8PoE Series: 8+2G-port Gigabit PoE+ managed Ethernet switches with 8 IEEE 802.3af/at PoE+ ports 1-66
EDS-P510 Series: 7+3G-port Gigabit managed Ethernet switches with 4 IEEE 802.3af PoE ports 1-68
EDS-P506A-4PoE Series: 6-port managed Ethernet switches with 4 IEEE 802.3af/at PoE ports 1-70
EDS-G205A-4PoE Series: 5-port full Gigabit unmanaged Ethernet switches with 4 IEEE 802.3af/at PoE+ ports 1-72
EDS-P206A-4PoE Series: 6-port unmanaged Ethernet switches with 4 IEEE 802.3af/at PoE+ ports 1-74
EDS-P308 Series: 8-port unmanaged Ethernet switches with 4 IEEE 802.3af PoE ports 1-76
INJ-24A Series: Gigabit high power IEEE 802.3af/at PoE+ injectors 1-78
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Embedded Ethernet Switch Modules

EOM-104 Series: 4-port embedded managed Ethernet switch modules 1-80

Media Modules and Accessories

OBU-102 Series: 2-channel optical fiber bypass units 1-82
SFP-10G Series: 1-port 10 Gigabit Ethernet SFP+ modules 1-84
SFP-1G Series: 1-port Gigabit Ethernet SFP modules 1-85
SFP-1G Copper Series: 1-port Gigabit Ethernet Copper SFP modules 1-87
SFP-1FE Series: 1-port Fast Ethernet SFP modules 1-88
SFP Compatibility Matrix: 1-89
ABC Series: Configuration backup and restoration tool for managed switches and wireless APs/Bridges/Clients 1-90

Rackmount Ethernet Switches

	Managed Rackmount Switches							
	ICS-G7852A	ICS-G7850A	ICS-G7848A	ICS-G7752A	ICS-G7750A	ICS-G7748A	ICS-G7828A	ICS-G7826A
Supported Modules								
Gigabit Media Modules	✓	✓	✓	✓	✓	✓	–	–
Fast Media Modules	–	–	–	–	–	–	–	–
SFP+ 10 Gigabit Ethernet Modules	✓	✓	–	✓	✓	–	✓	✓
SFP Gigabit Ethernet Modules	✓	✓	✓	✓	✓	✓	✓	✓
SFP Fast Ethernet Modules	✓	✓	✓	✓	✓	✓	✓	✓
Number of Ports								
Max. Number of Ports	52	50	48	52	50	48	28	26
10 Gigabit Ethernet	4	2	–	4	2	–	4	2
Gigabit Ethernet, 10/100/1000 Mbps	up to 48	up to 48	up to 48	up to 48	up to 48	up to 48	24	24
Fast Ethernet, 10/100 Mbps	–	–	–	–	–	–	–	–
Available Power Input								
24 VDC	–	–	–	–	–	–	–	–
24 VAC	–	–	–	–	–	–	–	–
48 VDC	–	–	–	–	–	–	–	–
12/24/48 VDC	–	–	–	–	–	–	–	–
85 to 264 VAC	✓	✓	✓	✓	✓	✓	✓	✓
88 to 300 VDC or 85 to 264 VAC, isolated	–	–	–	–	–	–	–	–
Installation Options								
DIN-Rail Mounting	–	–	–	–	–	–	–	–
Panel Mounting	–	–	–	–	–	–	–	–
Rack Mounting	✓	✓	✓	✓	✓	✓	✓	✓
Supported Operating Temperatures								
-10 to 60°C (14 to 140°F)	✓	✓	✓	✓	✓	✓	✓	✓
-40 to 75°C (-40 to 167°F)	–	–	–	–	–	–	–	–
Redundancy and Backup Options								
Turbo Ring	✓	✓	✓	✓	✓	✓	✓	✓
Turbo Chain	✓	✓	✓	✓	✓	✓	✓	✓
V-ON	✓	✓	✓	✓	✓	✓	✓	✓
STP/RSTP	✓	✓	✓	✓	✓	✓	✓	✓
Automatic Backup Configurator (ABC-02)	✓	✓	✓	✓	✓	✓	✓	✓
Network Management and Control								
Layer 3 Switching	✓	✓	✓	–	–	–	✓	✓
Port Trunking	✓	✓	✓	✓	✓	✓	✓	✓
Modbus/TCP	✓	✓	✓	✓	✓	✓	✓	✓
SNMP/RMON	✓	✓	✓	✓	✓	✓	✓	✓
LLDP	✓	✓	✓	✓	✓	✓	✓	✓
DHCP Option 66/67/82	✓	✓	✓	✓	✓	✓	✓	✓
IGMP/GMRP	✓	✓	✓	✓	✓	✓	✓	✓
QoS	✓	✓	✓	✓	✓	✓	✓	✓
VLAN	✓	✓	✓	✓	✓	✓	✓	✓
Access Control Lists (ACL)	✓	✓	✓	–	–	–	✓	✓
IEEE 802.1X	✓	✓	✓	✓	✓	✓	✓	✓
Port Lock	✓	✓	✓	✓	✓	✓	✓	✓
IPv6	–	–	–	✓	✓	✓	–	–
Relay Warning	✓	✓	✓	✓	✓	✓	✓	✓
Standards and Certifications								
CE/FCC	✓	✓	✓	✓	✓	✓	✓	✓
UL 60950-1	✓	✓	✓	✓	✓	✓	✓	✓
UL 508	–	–	–	–	–	–	–	–
DNV/GL	–	–	–	–	–	–	–	–
ABS/LR/NK	–	–	–	–	–	–	–	–
NEMA TS2	–	–	–	–	–	–	–	–
EN 50121-4	✓	✓	✓	✓	✓	✓	✓	✓
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Rackmount Ethernet Switches

	Managed Rackmount Switches					
	ICS-G7528A	ICS-G7526A	IKS-G6824A	IKS-G6524A	IKS-6728A	IKS-6726A
Supported Modules						
Gigabit Media Modules	–	–	–	–	–	–
Fast Media Modules	–	–	–	–	✓	✓
SFP+ 10 Gigabit Ethernet Modules	✓	✓	–	–	–	–
SFP Gigabit Ethernet Modules	✓	✓	✓	✓	✓	✓
SFP Fast Ethernet Modules	✓	✓	✓	✓	✓	✓
Number of Ports						
Max. Number of Ports	28	26	24	24	28	26
10 Gigabit Ethernet	4	2	–	–	–	–
Gigabit Ethernet, 10/100/1000 Mbps	24	24	24	24	4	2
Fast Ethernet, 10/100 Mbps	–	–	–	–	up to 24	up to 24
Available Power Input						
24 VDC	–	–	–	–	✓	✓
24 VAC	–	–	–	–	–	–
48 VDC	–	–	–	–	✓	✓
12/24/48 VDC	–	–	–	–	–	–
85 to 264 VAC	✓	✓	✓	✓	✓	✓
88 to 300 VDC or 85 to 264 VAC, isolated	–	–	–	–	–	–
Installation Options						
DIN-Rail Mounting	–	–	–	–	–	–
Panel Mounting	–	–	–	–	–	–
Rack Mounting	✓	✓	✓	✓	✓	✓
Supported Operating Temperatures						
-10 to 60°C (14 to 140°F)	✓	✓	✓	✓	–	–
-40 to 75°C (-40 to 167°F)	–	–	✓	✓	✓	✓
Redundancy and Backup Options						
Turbo Ring	✓	✓	✓	✓	✓	✓
Turbo Chain	✓	✓	✓	✓	✓	✓
V-ON	✓	✓	✓	✓	✓	✓
STP/RSTP	✓	✓	✓	✓	✓	✓
Automatic Backup Configurator (ABC-02)	✓	✓	✓	✓	✓	✓
Network Management and Control						
Layer 3 Switching	–	–	✓	–	–	–
Port Trunking	✓	✓	✓	✓	✓	✓
Modbus/TCP	✓	✓	✓	✓	✓	✓
SNMP/RMON	✓	✓	✓	✓	✓	✓
LLDP	✓	✓	✓	✓	✓	✓
DHCP Option 66/67/82	✓	✓	✓	✓	✓	✓
IGMP/GMRP	✓	✓	✓	✓	✓	✓
QoS	✓	✓	✓	✓	✓	✓
VLAN	✓	✓	✓	✓	✓	✓
Access Control Lists (ACL)	–	–	✓	–	–	–
IEEE 802.1X	✓	✓	✓	✓	✓	✓
Port Lock	✓	✓	✓	✓	✓	✓
IPv6	✓	✓	–	✓	✓	✓
Relay Warning	✓	✓	✓	✓	✓	✓
Standards and Certifications						
CE/FCC	✓	✓	✓	✓	✓	✓
UL 60950-1	✓	✓	✓	✓	✓	✓
UL 508	–	–	–	–	–	–
DNV/GL	–	–	–	–	✓	✓
ABS/LR/NK	–	–	–	–	✓	✓
NEMA TS2	–	–	–	–	–	–
EN 50121-4	✓	✓	✓	✓	✓	✓
Page	1-16	1-16	1-19	1-19	1-22	1-22

DIN-Rail Ethernet Switches

	Managed DIN-Rail Switches								
	EDS-828	EDS-728	EDS-619	EDS-616	EDS-611	EDS-608	EDS-G516E	EDS-G512E	EDS-G508E
Supported Modules									
Gigabit Media Modules	✓	✓	–	–	–	–	–	–	–
Fast Media Modules	✓	✓	✓	✓	✓	✓	–	–	–
SFP Gigabit Ethernet Modules	✓	✓	✓	–	✓	–	✓	✓	–
SFP Fast Ethernet Modules	–	–	✓	–	✓	–	✓	✓	–
Number of Ports									
Max. Number of Ports	28	28	19	16	11	8	16	12	8
Gigabit Ethernet, 10/100/1000 Mbps	up to 4	up to 4	3	–	3	–	16	12	8
Fast Ethernet, 10/100 Mbps	up to 24	up to 24	up to 16	up to 16	up to 8	up to 8	–	–	–
Available Power Input									
24 VDC	✓	✓	–	–	–	–	–	–	–
12/24/48 VDC	–	–	✓	✓	✓	✓	–	–	–
12/24/48/-48 VDC	–	–	–	–	–	–	✓	✓	✓
Installation Options									
DIN-Rail Mounting	✓	✓	✓	✓	✓	✓	✓	✓	✓
Panel Mounting	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit
Rack Mounting	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit
Supported Operating Temperatures									
0 to 60°C (32 to 140°F)	✓	✓	✓	✓	✓	✓	–	–	–
-10 to 60°C (14 to 140°F)	–	–	–	–	–	–	✓	✓	✓
-40 to 75°C (-40 to 167°F)	–	–	✓	✓	✓	✓	✓	✓	✓
Redundancy and Backup Options									
Turbo Ring	✓	✓	✓	✓	✓	✓	✓	✓	✓
Turbo Chain	✓	✓	✓	✓	✓	✓	✓	✓	✓
V-ON	–	–	–	–	–	–	✓	✓	✓
STP/RSTP	✓	✓	✓	✓	✓	✓	✓	✓	✓
MSTP	✓	✓	✓	✓	✓	✓	✓	✓	✓
Automatic Backup Configurator (ABC-01)	✓	✓	✓	✓	✓	✓	–	–	–
Automatic Backup Configurator (ABC-02)	–	–	–	–	–	–	✓	✓	✓
Network Management and Control									
Layer 3 Switching	✓	–	–	–	–	–	–	–	–
Port Trunking	✓	✓	✓	✓	✓	✓	✓	✓	✓
Modbus/TCP	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ethernet/IP	✓	✓	✓	✓	✓	✓	✓	✓	✓
PROFINET	–	–	–	–	–	–	✓	✓	✓
SNMP/RMON	✓	✓	✓	✓	✓	✓	✓	✓	✓
LLDP	✓	✓	✓	✓	✓	✓	✓	✓	✓
DHCP Option 66/67/82	✓	✓	✓	✓	✓	✓	✓	✓	✓
IGMP Snooping/GMRP	✓	✓	✓	✓	✓	✓	✓	✓	✓
QoS	✓	✓	✓	✓	✓	✓	✓	✓	✓
IEEE 802.1Q VLAN	✓	✓	✓	✓	✓	✓	✓	✓	✓
Port-based VLAN	–	–	✓	✓	✓	✓	✓	✓	✓
Access Control Lists (ACL)	✓	–	–	–	–	–	✓	✓	✓
IEEE 802.1X	✓	✓	✓	✓	✓	✓	✓	✓	✓
Port Lock	✓	✓	✓	✓	✓	✓	✓	✓	✓
IPv6	–	✓	✓	✓	✓	✓	✓	✓	✓
Relay Warning	✓	✓	✓	✓	✓	✓	✓	✓	✓
Standards and Certifications									
CE/FCC	✓	✓	✓	✓	✓	✓	✓	✓	✓
UL 60950-1	✓	✓	✓	✓	✓	✓	–	–	–
UL 508	✓	✓	✓	✓	✓	✓	✓	✓	✓
UL 61010-2-201	–	–	–	–	–	–	–	–	–
EN 60950-1	✓	✓	✓	✓	✓	✓	–	–	–
UL/cUL Class 1 Div. 2	–	–	✓	✓	✓	✓	✓	✓	✓
ATEX Zone 2	–	–	✓	✓	✓	✓	✓	✓	✓
DNV/GL	✓	✓	✓	✓	✓	✓	✓	✓	✓
ABS/LR/NK	✓	✓	✓	✓	✓	✓	✓	✓	✓
NEMA TS2	–	–	✓	✓	✓	✓	✓	✓	✓
EN 50121-4	–	–	✓	✓	✓	✓	✓	✓	✓
IEEE 1613	–	–	–	–	–	–	✓	✓	✓
IEC 61850-3	–	–	–	–	–	–	✓	✓	✓
Page	1-27	1-27	1-31	1-31	1-31	1-31	1-35	1-35	1-35

DIN-Rail Ethernet Switches

	Managed DIN-Rail Switches								
	EDS-G509	EDS-518E	EDS-510E	EDS-516A	EDS-508A	EDS-505A	EDS-408A	EDS-405A	EDS-405A-PTP
Supported Modules									
Gigabit Media Modules	–	–	–	–	–	–	–	–	–
Fast Media Modules	–	–	–	–	–	–	–	–	✓
SFP Gigabit Ethernet Modules	✓	✓	✓	–	–	–	–	–	–
SFP Fast Ethernet Modules	✓	✓	✓	–	–	–	–	–	–
Number of Ports									
Max. Number of Ports	9	18	10	16	8	5	8	5	5
Gigabit Ethernet, 10/100/1000 Mbps	9	4	3	–	–	–	–	–	–
Fast Ethernet, 10/100 Mbps	–	14	7	16	8	5	8	5	5
Available Power Input									
24 VDC	–	–	–	✓	✓	✓	✓	✓	–
12/24/48 VDC	✓	–	–	–	–	–	–	–	✓
12/24/48/-48 VDC	–	✓	✓	–	–	–	–	–	–
Installation Options									
DIN-Rail Mounting	✓	✓	✓	✓	✓	✓	✓	✓	✓
Panel Mounting	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit
Rack Mounting	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit
Supported Operating Temperatures									
0 to 60°C (32 to 140°F)	✓	–	–	✓	✓	✓	✓	✓	–
-10 to 60°C (14 to 140°F)	–	✓	✓	–	–	–	–	–	✓
-40 to 75°C (-40 to 167°F)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Redundancy and Backup Options									
Turbo Ring	✓	✓	✓	✓	✓	✓	✓	✓	✓
Turbo Chain	✓	✓	✓	✓	✓	✓	✓	✓	✓
V-ON	–	✓	✓	–	–	–	–	–	–
STP/RSTP	✓	✓	✓	✓	✓	✓	✓	✓	✓
MSTP	✓	✓	✓	✓	✓	✓	–	–	✓
Automatic Backup Configurator (ABC-01)	✓	-	–	✓	✓	✓	✓	✓	✓
Automatic Backup Configurator (ABC-02)	–	✓	✓	–	–	–	–	–	–
Network Management and Control									
Layer 3 Switching	–	-	–	–	–	–	–	–	–
Port Trunking	✓	✓	✓	✓	✓	✓	–	–	–
Modbus/TCP	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ethernet/IP	✓	✓	✓	✓	✓	✓	✓	✓	✓
PROFINET	–	✓	✓	–	–	–	EDS-408A-PN series only	EDS-405A-PN series only	✓
SNMP/RMON	✓	✓	✓	✓	✓	✓	✓	✓	✓
LLDP	✓	✓	✓	✓	✓	✓	✓	✓	✓
DHCP Option 66/67/82	✓	✓	✓	✓	✓	✓	✓	✓	✓
IGMP Snooping/GMRP	✓	✓	✓	✓	✓	✓	✓	✓	✓
QoS	✓	✓	✓	✓	✓	✓	✓	✓	✓
IEEE 802.1Q VLAN	✓	✓	✓	✓	✓	✓	✓	✓	✓
Port-based VLAN	✓	✓	✓	✓	✓	✓	✓	✓	✓
Access Control Lists (ACL)	–	–	–	–	–	–	–	–	–
IEEE 802.1X	✓	✓	✓	✓	✓	✓	–	–	✓
Port Lock	✓	✓	✓	✓	✓	✓	–	–	✓
IPv6	✓	✓	✓	✓	✓	✓	✓	✓	✓
Relay Warning	✓	✓	✓	✓	✓	✓	✓	✓	✓
Standards and Certifications									
CE/FCC	✓	✓	✓	✓	✓	✓	✓	✓	✓
UL 60950-1	–	–	–	✓	✓	✓	✓	✓	✓
UL 508	✓	✓	✓	✓	✓	✓	✓	✓	✓
UL 61010-2-201	–	–	–	–	–	–	–	–	–
EN 60950-1	✓	–	–	✓	✓	✓	–	–	–
UL/cUL Class 1 Div. 2	–	✓	✓	✓	✓	✓	✓	✓	✓
ATEX Zone 2	–	✓	✓	✓	✓	✓	✓	✓	✓
DNV/GL	✓	–	–	✓	✓	✓	✓	✓	✓
ABS/LR/NK	✓	–	–	–	–	–	EDS-408A 3 Fiber series only	–	–
NEMA TS2	–	✓	✓	–	–	–	✓	✓	✓
EN 50121-4	✓	✓	✓	–	–	–	✓	–	–
IEEE 1613	–	✓	✓	–	–	–	–	–	–
IEC 61850-3	–	✓	–	–	–	–	–	–	–
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DIN-Rail Ethernet Switches

	Unmanaged DIN-Rail Switches										
	EDS-G308	EDS-G205	EDS-316	EDS-309	EDS-308	EDS-305	EDS-210A	EDS-208A	EDS-205A	EDS-208	EDS-205
Supported Modules											
SFP Gigabit Ethernet Modules	✓	✓	–	–	–	–	✓	–	–	–	–
SFP Fast Ethernet Modules	✓	✓	–	–	–	–	✓	–	–	–	–
Number of Ports											
Max. Number of Ports	8	5	16	9	8	5	10	8	5	8	5
Gigabit Ethernet, 10/100/1000 Mbps	8	5	–	–	–	–	up to 2	–	–	–	–
Fast Ethernet, 10/100 Mbps	–	–	16	9	8	5	up to 9	8	5	8	5
Available Power Input											
24 VDC	–	–	–	✓	✓	✓	–	–	–	✓	✓
24 VAC	–	–	–	–	–	–	–	✓	✓	✓	✓
12/24/48 VDC	✓	✓	✓	–	–	–	✓	✓	✓	–	–
Installation Options											
DIN-Rail Mounting	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Panel Mounting	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	–	–
Rack Mounting	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit
Supported Operating Temperatures											
0 to 60°C (32 to 140°F)	–	–	✓	✓	✓	✓	–	–	–	–	–
-10 to 60°C (14 to 140°F)	✓	✓	–	–	–	–	✓	✓	✓	✓	✓
-40 to 75°C (-40 to 167°F)	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–
Standards and Certifications											
CE/FCC	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
UL 60950-1	–	–	✓	✓	✓	✓	–	–	–	–	–
UL 508	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
UL 61010-2-201	–	–	–	–	–	–	–	–	–	–	–
EN 60950-1	–	✓	✓	✓	✓	–	–	–	✓	✓	✓
UL/cUL Class 1 Div. 2	✓	✓	✓	✓	✓	✓	–	✓	✓	–	–
ATEX Zone 2	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	–
DNV/GL	–	–	✓	✓	✓	✓	–	✓	✓	–	–
ABS/LR/NK	–	–	–	–	–	–	–	✓	✓	–	–
NEMA TS2	–	–	–	–	–	–	–	✓	✓	–	–
EN 50121-4	✓	✓	–	–	–	–	–	✓	✓	–	–
IEC 61850-3	–	–	–	–	–	–	–	–	–	–	–
Page	1-50	1-50	1-52	1-52	1-52	1-52	1-55	1-57	1-57	1-59	1-59

PoE Switches

	Managed Rackmount PoE Switches		Managed DIN-Rail PoE Switches			Unmanaged DIN-Rail PoE Switches		
	IKS-6728A-8PoE	EDS-G512E-8PoE	EDS-P510A-8PoE	EDS-P510	EDS-P506A-4PoE	EDS-G205A-4PoE	EDS-P206A-4PoE	EDS-P308
Supported Modules								
Gigabit Media Modules	–	–	–	–	–	–	–	–
Fast Media Modules	✓	✓	–	–	–	–	–	–
SFP Gigabit Ethernet Modules	✓	✓	✓	✓	–	✓	–	–
SFP Fast Ethernet Modules	✓	✓	✓	✓	–	✓	–	–
Number of Ports								
Max. Number of Ports	28	12	10	10	6	5	6	8
Gigabit Ethernet, 10/100/1000 Mbps	up to 4	12	2	3	–	5	–	–
PoE, Gigabit Ethernet, 10/100/1000 Mbps	–	8 (PoE+)	–	–	–	4 (PoE+)	–	–
Fast Ethernet, 10/100 Mbps	up to 24	–	8	7	6	–	6	8
PoE, Fast Ethernet, 10/100 Mbps	up to 24 (PoE+)	–	8 (PoE+)	4	4 (PoE+)	–	4 (PoE+)	4
Available Power Input								
24 VDC	–	–	–	–	✓	–	✓	–
48 VDC	✓	✓	✓	✓	✓	–	✓	✓
12/24/48 VDC	–	–	–	–	–	✓	–	–
85-264 VAC	✓	–	–	–	–	–	–	–
Installation Options								
DIN-Rail Mounting	–	✓	✓	✓	✓	✓	✓	✓
Panel Mounting	–	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit
Rack Mounting	✓	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit
Supported Operating Temperatures								
0 to 60°C (32 to 140°F)	–	–	–	✓	✓	✓	✓	✓
-10 to 60°C (14 to 140°F)	–	✓	✓	–	–	–	–	–
-40 to 75°C (-40 to 167°F)	✓	✓	✓	✓	✓	✓	✓	✓
Redundancy and Backup Options								
Turbo Ring	✓	✓	✓	✓	✓	–	–	–
Turbo Chain	✓	✓	✓	✓	✓	–	–	–
V-ON	✓	✓	✓	✓	–	–	–	–
STP/RSTP	✓	✓	✓	✓	✓	–	–	–
MSTP	✓	✓	✓	✓	✓	–	–	–
Automatic Backup Configurator (ABC-01)	–	–	✓	✓	✓	–	–	–
Automatic Backup Configurator (ABC-02)	✓	✓	–	–	–	–	–	–
Network Management and Control								
Port Trunking	✓	✓	✓	✓	✓	–	–	–
Modbus/TCP	✓	✓	✓	✓	✓	–	–	–
Ethernet/IP	✓	✓	✓	✓	✓	–	–	–
IEEE 1588 PTP	✓	✓	✓	✓	✓	–	–	–
SNMP/RMON	✓	✓	✓	✓	✓	–	–	–
LLDP	✓	✓	✓	✓	✓	–	–	–
DHCP Option 66/67/82	✓	✓	✓	✓	✓	–	–	–
IGMP Snooping/GMRP	✓	✓	✓	✓	✓	–	–	–
QoS	✓	✓	✓	✓	✓	–	–	–
VLAN	✓	✓	✓	✓	✓	–	–	–
IEEE 802.1X	✓	✓	✓	✓	✓	–	–	–
Port Lock	✓	✓	✓	✓	✓	–	–	–
IPv6	✓	✓	✓	✓	✓	–	–	–
Relay Warning	✓	✓	✓	✓	✓	–	–	–
Standards and Certifications								
CE/FCC	✓	✓	✓	✓	✓	✓	✓	✓
UL 60950-1	✓	–	–	–	–	–	–	–
UL 508	–	✓	✓	✓	✓	✓	✓	✓
UL 61010-2-201	–	–	–	–	–	–	–	–
EN 60950-1	✓	✓	–	✓	✓	✓	✓	✓
UL/cUL Class 1 Div. 2	–	–	✓	–	–	–	–	–
ATEX Zone 2	–	–	–	–	–	–	–	–
DNV/GL	–	–	–	✓	–	–	–	✓
ABS/LR/NK	–	–	–	✓	–	–	–	✓
NEMA TS2	–	–	✓	–	–	–	–	–
EN 50121-4	–	✓	✓	–	✓	✓	–	–
IEC 61850-3	–	–	–	–	–	–	–	–
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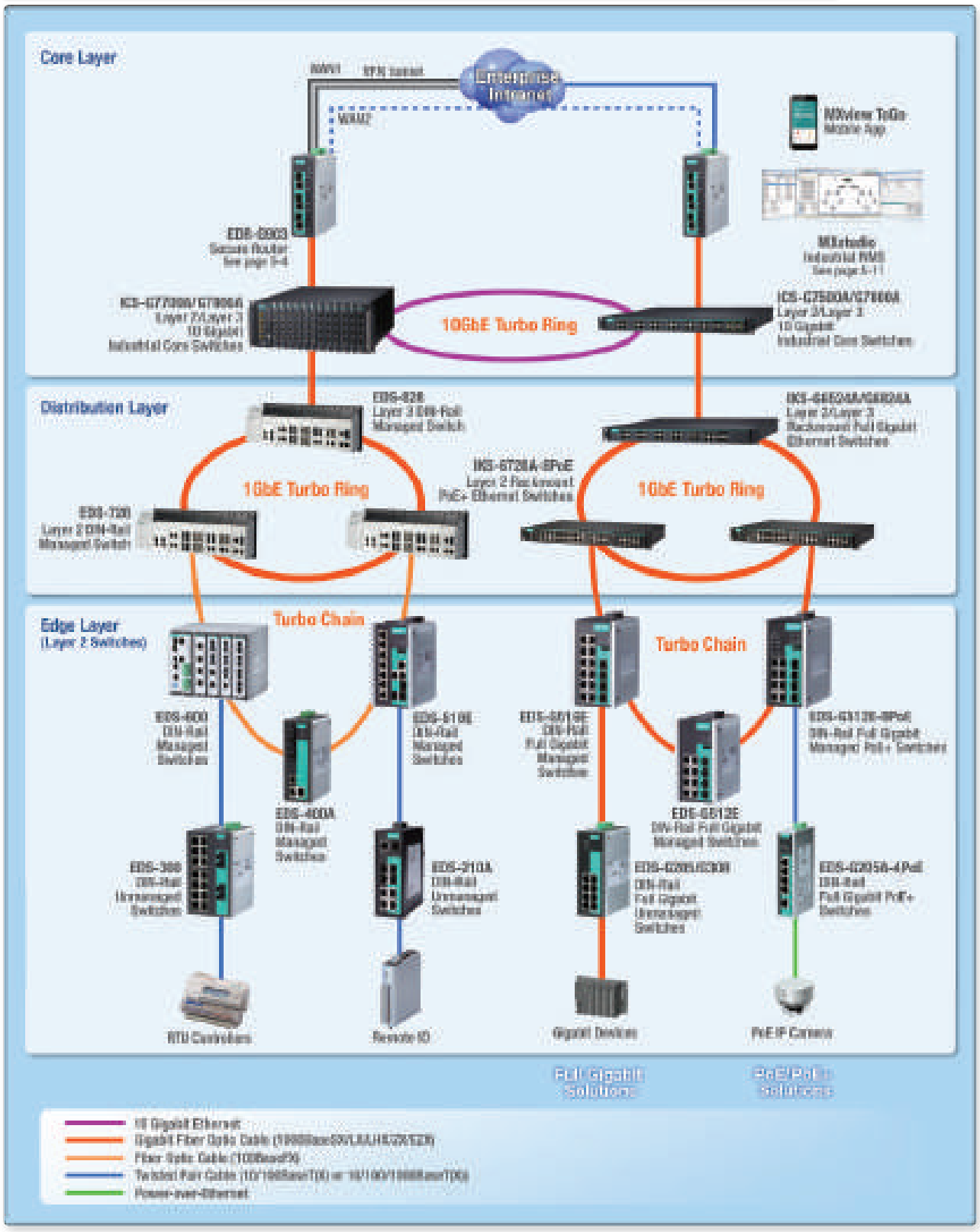
Introduction to Edge-to-Core Industrial Ethernet Solutions

A Comprehensive Portfolio of Edge-to-Core Ethernet Switches



Embrace Edge-to-Core Industrial Ethernet Infrastructure

Moxa delivers a tailored edge-to-core industrial Ethernet infrastructure for industrial automation applications, providing a reliable, scalable, and flexible network foundation for today and tomorrow. Moxa's one-stop shop of Ethernet solutions includes:

Core Layer

High Bandwidth 10GbE Industrial Core Switches

- Full Gigabit Layer 2/Layer 3
- Up to 4 10GbE ports
- Up to 24 or 48 1GbE connection
- Rugged, fanless design
- Absolutely non-stop operations
- Designed for large-scale applications

Edge Layer

Compact, Standalone/Modular DIN-Rail Switches

- Widest selection of switches: from 5 to 19 ports, Fast Ethernet to Full Gigabit Ethernet, managed to unmanaged, PoE to PoE+
- Best price-to-performance ratio
- Advanced Layer 2 networking capability
- Supports EtherNet/IP, PROFINET, and Modbus/TCP for industrial protocols interoperability
- Turbo Ring and Turbo Chain for highly resilient networks

Distribution Layer

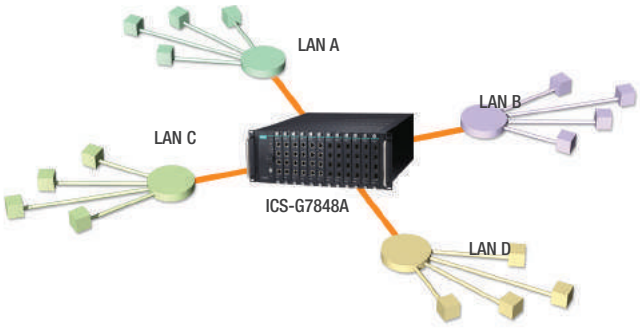
Industrial Modular DIN-Rail and Rackmount Switches

- Full Gigabit Layer 2/Layer 3
- Up to 24 1GbE connections
- Up to 24 PoE+ ports
- High port density (> 19 ports)
- Flexibility with modular design
- Gigabit Turbo Ring & Turbo Chain
- Ideal for control room and outdoor cabinet operations

High-performance Layer 3 Switching Capability

Optimum Network Efficiency through LAN Segmentation

Layer 3 switches use the IP address to make switching decisions, as routers do, but are hardware-optimized to transmit data just as fast as Layer 2 switches. The 802.1Q VLAN of a Layer 2 switch allows network operators to configure and maintain their network more effectively, but cross VLAN communication still relies on traditional Layer 3 routers. Both routers and Layer 3 switches use a routing protocol and routing table to determine the best path. However, compared to routers, which are usually software-based, Layer 3 switches are faster and less expensive. This is due to their built-in switching hardware with optimized chips and full-wire speed IP frame forwarding performance suitable for interconnecting VLANs. Moxa now offers high-performance Layer 3 switches that use state-of-the-art routing technology to partition a large-scale LAN into multiple subnets for improved network performance.



Future-Proof Performance

Moxa's rackmount switches include high-density fixed and modular 10GbE and full-Gigabit platforms with copper, fiber, or SFP/SFP+ port combinations to fulfill highly dynamic backbone requirements.

- Up to 4 10GbE and 48 GbE uplinks
- Flexible density with 4-port slot and single-port 10GbE/GbE modularity
- Tiny 10GbE/GbE SFP transceiver modules allow transmission up to 120 km

Versatile Layer 2 Industrial Network Management

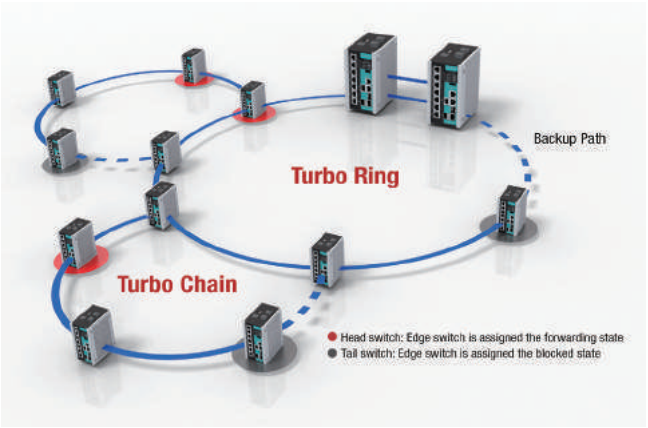
Optimized Network Designs for High Availability

Network reliability is essential for industrial Ethernet infrastructures. To maximize system reliability and uptime during network failures, Moxa offers Turbo Ring and Turbo Chain Ethernet network redundancy technologies throughout a wide range of industrial managed switch solutions that are designed from the very start for high availability. Turbo Ring is a proprietary self-healing protocol that supports three topology options, including ring-coupling, dual ring, and dual homing, to enable fast fault recovery in less than 20 ms (tested at a full load of 250 switches). Turbo Chain, a highly flexible self-healing Ethernet redundancy technology, is designed to go beyond the current limitations of redundant ring technology by easily connecting and extending existing redundant networks. Turbo Chain technology also supports IEEE 802.1w/802.1D-2004 RSTP and STP protocols. Moxa's industrial Ethernet solutions can simplify and optimize network designs with superior availability, reliability, flexibility to deliver large savings on deployment time and cost.

Real-world testing of Turbo Chain with 250 EDS switches

Turbo Ring: Enabling Ring and Media Redundancy

- Fast fault recovery < 20 ms
- Flexible ring topology
- Lower total cost of ownership



Turbo Chain: Build Complex Redundant Networks Quickly and Easily

- Fast fault recovery < 20 ms
- Unlimited redundant network expansions
- Live node expansion without network interruptions
- Tremendous savings on cabling cost

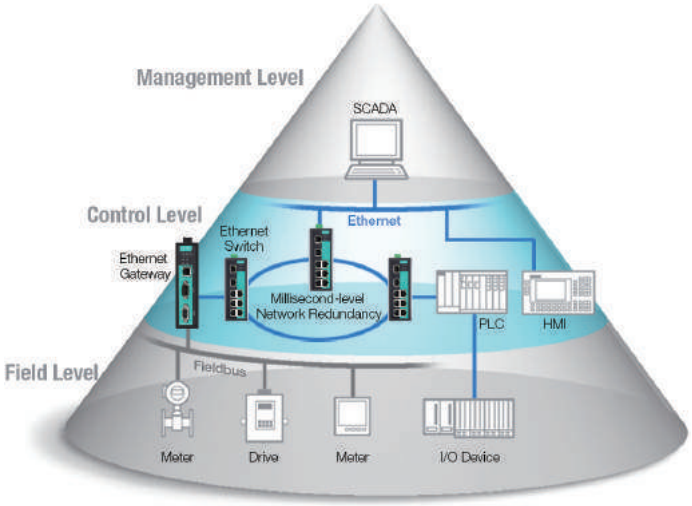
V-ON: Ensure Always-on Video on L2/L3 Networks

Combining proprietary technologies to achieve millisecond recovery, V-ON™ ensures a nonstop industrial network for data, voice, and video communication in mission-critical environments. This unique V-ON™ technology is setting a new standard in fast recovery on Layer 2 (less than 50 ms) and Layer 3 (less than 300 ms) recovery by integrating these technologies:

- Path redundancy: Turbo Ring and Turbo Chain.
- Router redundancy: Fast VRRP for millisecond redundancy
- Protocol optimization: Layer 2 Multicast fast forwarding and Layer 3 Multicast local route

Easy Network Management

Moxa's managed Ethernet switches are certified to be compliant with PROFINET, Modbus/TCP, and EtherNet/IP industrial Ethernet protocols to allow effortless integration with industrial SCADA/HMI/PLC systems. Moxa's managed switches ensure seamless interoperability with major industrial Ethernet automation networks without the need for additional switch configuration/modification.



Rugged Industrial Design for Outstanding Reliability

Many mission-critical applications in industrial automation require highly-available network transmissions to provide real-time monitoring and control, prevent production losses from system downtime, and ensure onsite personnel safety. Robustness of industrial Ethernet switch is one of the critical factors to achieve highly reliable networks. Moxa's rugged industrial-grade Ethernet switch solutions are ideal for operation in harsh industrial environments, such as traffic control, oil and gas, marine, and wayside applications, which can demand the following requirements:

- Immunity from electromagnetic interference
- Ability to withstand vibration, impacts, dust, humidity, and corrosive environments
- Ability to withstand exposure to extreme temperatures
- Versatile power input for maximum network uptime
- Compliant with industry certifications and standards

Reliable Network Connections in Harsh Environmental Conditions

Moxa's industrial Ethernet switches are designed with excellent electromagnetic immunity, high anti-vibration capability, and advanced thermal dissipation to excel in harsh environmental conditions. Moxa's advanced Ethernet switches are compliant with IEEE 1613* standards with EMS Level 4 protection against extreme ESD, EFT/Burst, and surge to provide a higher level of reliability for industrial networks. These advanced switches also conform to the IEC 60068-2 standard and the high strength DIN-rail mounting kit is tested at over 5g* of acceleration to resist severe vibration to deliver uninterrupted data transmission. Optimized thermal fin design efficiently dissipates heat and significantly reduces operating temperature to prolong device lifetime.

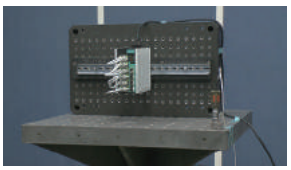
*EDS E series only

ESD Test

Surge Test

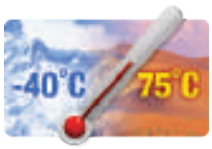
EFT/Burst Test

Vibration Test



Designed to Withstand Extreme Temperatures

Industrial environments require network devices that operate reliably when subjected to wide temperature fluctuations. Tested beyond industry standards to ensure Moxa's Ethernet switches were tested beyond industry standards to ensure reliable operation in a -40 to 75°C operating temperature range. Moxa's Ethernet switches are all held to strict minimal packet loss requirements, and use passive cooling to ensure reliability in extreme temperatures.



SmartPoE Solution for Simple and Flexible Connections

Moxa provides a complete range of solutions for any IEEE 802.3af/at PoE/PoE+ compliant units that are ideal for hard-to-reach outdoor or harsh environments where a power installation is not readily available or is cost-prohibitive. With Moxa's SmartPoE enables intelligent PoE power links, diagnostics, and monitoring to simplify PD (powered device) configuration and management. The built-in feature reduces the time and costs required for troubleshooting and maintenance.

Superior PoE/PoE+ Capability

- Up to 48 Gigabit PoE+ links
- 15.4/30/36/60 W PoE/PoE+ high power PoE output selection
- Smart Powering provides various PoE port output modes for non-standard PD and legacy PD

Easy Management

- Smart suggestion for PD configuration
- Smart monitoring for real-time output monitoring and PD failure checking and rebooting

Outdoor Reliability

- 3 kV LAN surge protection
- -40 to 75°C operating temperature range
- Supports Turbo Ring, Turbo Chain, and MSTP/RSTP/STP redundancy technologies

See Page 1-63

SmartPoE

Moxa's SmartPoE enables intelligent PoE power links, diagnostics, and monitoring to simplify PD (powered device) configuration and management. This built-in feature reduces the time and costs required for troubleshooting and maintenance.

Smart Diagnostics

- Auto PD detection of power class, status, and error
- Smart suggestion for PD configuration

Smart Powering

- High power mode supports non-standard PDs
- Force mode supports legacy PD

Smart Monitoring

- Real-time PoE output monitoring
- PoE power output threshold cutoff and active event warning

ICS-G7748A/G7750A/G7752A/ G7848A/G7850A/G7852A Series

48G/48G+2 10GbE/48G+4 10GbE-port Layer 2/Layer 3 full Gigabit modular managed Ethernet switches

- Up to 48 Gigabit Ethernet ports plus 4 10G Ethernet ports
- Up to 52 optical fiber connections (SFP slots)
- Up to 48 PoE+ ports with external power supply (with IM-G7000A-4PoE module)
- Fanless, -10 to 60°C operating temperature range
- Modular design for maximum flexibility and hassle-free future expansion
- Hot swap interface and power modules for continuous operation
- Turbo Ring and Turbo Chain (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- Isolated redundant power inputs with universal 110/220 VAC power supply range
- Supports MXstudio for easy, visualized industrial network management
- V-ON™ ensures millisecond-level multicast data and video network recovery

Introduction

Process automation and transportation automation applications combine data, voice, and video, and consequently require high performance and high reliability. The ICS-G7748A/G7750A/G7752A/ G7848A/G7850A/G7852A series full Gigabit backbone switches' modular design makes network planning easy, and allows greater flexibility by letting you install up to 48 Gigabit Ethernet ports plus 4 10 Gigabit Ethernet ports. The ICS-G7848A/G7850A/G7852A series also supports Layer 3 routing functionality to facilitate the deployment of applications across networks, making them ideal for large scale industrial networks. The ICS-G7748A/G7750A/G7752A/ G7848A/G7850A/G7852A's full Gigabit capability increases bandwidth to provide high performance and the ability to quickly transfer large amounts of video, voice, and data across a network. The switches support the Turbo Ring, Turbo Chain, and RSTP/STP redundancy protocols, and are fanless and come with an isolated redundant power supply to increase system reliability and the availability of your network backbone.

Features and Benefits

- Layer 3 switching functionality to move data and information across networks (ICS-G7800A series)
- Advanced PoE management functions: PoE output setting, PD failure check, PoE scheduling, and PoE diagnostics (with IM-G7000A-4PoE module)
- Command line interface (CLI) for quickly configuring major managed functions
- Supports advanced VLAN capability with Q-in-Q tagging
- Software based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP and Modbus/TCP protocols for device management and monitoring
- Compatible with EtherNet/IP protocols for transparent data transmission
- Redundant Gigabit Turbo Ring and Turbo Chain (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- IEEE 802.1Q VLAN and GVRP protocol to ease network planning
- QoS (IEEE 802.1p/1Q and TOS/DiffServ) to increase determinism
- Port Trunking for optimum bandwidth utilization
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Access control lists (ACL) increase the flexibility and security of network management (ICS-G7800A series)
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output
- Digital inputs for integrating sensors and alarms with IP networks
- Redundant, dual AC power inputs

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX
IEEE 802.3ae for 10 Gigabit Ethernet
IEEE 802.3af/at for PoE/PoE+ output
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid Spanning Tree Protocol
IEEE 802.1s for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Software Features

Management: IPv4, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Q-in-Q VLAN, GVRP, IGMP v1/v2/v3, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Broadcast Storm Protection, Port Lock, Access Control Lists (ICS-G7800A series only)
Unicast Routing: Static Routing, RIPV1/V2, OSPF (ICS-G7800A series)
Multicast Routing: DVMRP, PIM-DM, PIM-SM, PIM-SSM (ICS-G7800A series)
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Groups 1, 2, 3, 9
Routing Redundancy: VRRP (ICS-G7800A series)

Switch Properties

Priority Queues: 8
Max. Number of VLANs: 256
VLAN ID Range: VID 1 to 4094
IGMP Groups: 4096
MAC Table Size: 16 K
Packet Buffer Size: 12 Mbit
DRAM Size: 128 MB
Flash Size: 16 MB
Jumbo Frame Size: 9.6 KB

Interface

Gigabit Ethernet: 12 slots for 4-port interface modules
• 10/100/1000BaseT(X), or
• PoE+ 10/100/1000BaseT(X), or
• 100/1000BaseSFP slots
Note: See the IM-G7000A datasheet for Gigabit Ethernet module product information.
10 Gigabit Ethernet: 2 or 4 10GbE SFP+ slots (ICS-G7750A/G7850A and ICS-G7752A/G7852A only)
Console Port: USB-serial console (Type B connector)
Storage Port: USB storage (Type A connector for ABC-02-USB)
Alarm Contact: 1 relay output with current carrying capacity of 2 A @ 30 VDC
Digital Inputs: 1 input with the same ground, but electrically isolated from the electronics.
• +13 to +30 V for state “1”
• -30 to +1 V for state “0”
• Max. input current: 8 mA

Power Requirements

Input Voltage: 110/220 VAC
Operating Voltage: 85 to 264 VAC
Input Current: ICS-G7748A/G7848A: Max. 0.87/0.6 A @ 110/220 VAC
ICS-G7750A/G7850A: Max. 0.94/0.64 A @ 110/220 VAC
ICS-G7752A/G7852A: Max. 1.01/0.68 A @ 110/220 VAC
Overload Current Protection: Present
Reverse Polarity Protection: Present

Physical Characteristics

IP Rating: IP30 protection
Dimensions: 440 x 176 x 523.8 mm (17.32 x 6.93 x 20.62 in)
Weight: 12.9 kg (28.5 lb)
Installation: 19-inch rack mounting

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Rail Traffic: EN 50121-4
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa’s website for the most up-to-date certification status.

MTBF (mean time between failures)

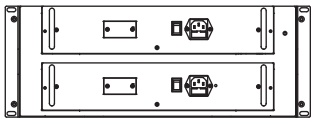
Time:
ICS-G7748A/G7848A: 314,973 hrs
ICS-G7750A/G7850A: 282,329 hrs
ICS-G7752A/G7852A: 274,488 hrs
Standard: Telcordia (Bellcore), GB

Warranty

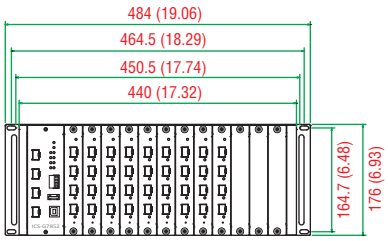
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

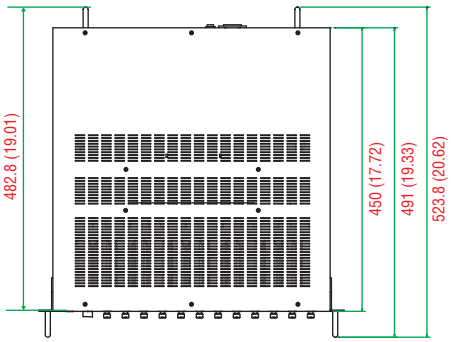
Unit: mm (inch)



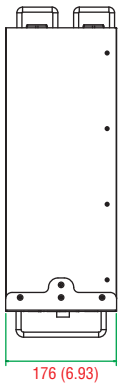
Rear View



Front View



Top View



Side View

Ordering Information

Step 1: Select Ethernet switch system

ICS-G7748A/G7750A/G7752A/G7848A/G7850A/G7852A with power supply

Step 2: Select interface modules

IM-G7000A (Gigabit Ethernet)

Note: The ICS-G7748A/G7750A/G7752A/G7848A/G7850A/G7852A Ethernet switch system is delivered without interface modules. See the IM-G7000A datasheet to determine which interface modules are suitable for your application. See the SFP-10G, SFP-1G, and SFP-1FE datasheets for SFP module product information.

Available Models

Available Models	Port Interface			Power Supply	
Standard Temperature (-10 to 60°C)	Gigabit Ethernet		10 Gigabit Ethernet	Isolated Power Supply 1	Isolated Power Supply 2
	10/100/1000BaseT(X)	100/1000BaseSFP*	10GbE SFP+*	HV: 85 to 264 VAC	HV: 85 to 264 VAC
ICS-G7748A/G7750A/G7752A Series Layer 2 Switches					
ICS-G7748A-HV-HV	up to 48	up to 48	–	1	1
ICS-G7750A-2XG-HV-HV	up to 48	up to 48	2	1	1
ICS-G7752A-4XG-HV-HV	up to 48	up to 48	4	1	1
ICS-G7848A/G7850A/G7852A Series Layer 3 Switches					
ICS-G7848A-HV-HV	up to 48	up to 48	–	1	1
ICS-G7850A-2XG-HV-HV	up to 48	up to 48	2	1	1
ICS-G7852A-4XG-HV-HV	up to 48	up to 48	4	1	1

Note: The ICS-G7748A/G7750A/G7752A/G7848A/G7850A/G7852A series supports 10GbE SFP+ and 100/1000BaseSFP slots. See the SFP-10G, SFP-1G, and SFP-1FE datasheets for SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-02-USB: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
Power Cords: See Appendix A for details

Package Checklist

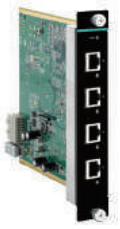
- ICS-G7748A/G7750A/G7752A/G7848A/G7850A/G7852A switch
- 12 interface cover plates
- USB cable (Type A male to Type B male)
- 2 power cords (US type x 1, EU type x 1)
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

IM-G7000A Series

4G-port Gigabit Ethernet interface modules for ICS-G7748A/G7750A/G7752A/ G7848A/G7850A/G7852A series modular managed Ethernet switches

Specifications

Gigabit Ethernet Interface Modules, IM-G7000A Series



IM-G7000A-4GTX

IM-G7000A-4GSFP

IM-G7000A-4PoE

Interface

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100/1000BaseSFP slot
LED Indicators: STAT, 10/100/1000 for TP port, 100/1000 for fiber port
Hot Swap Button: Push this button prior to swapping IM-G7000A modules
PoE+ Ports: 10/100/1000BaseT(X) auto negotiation speed, compliant with IEEE 802.3af/at high power mode up to 36 W

Power Requirements

Power Consumption:
IM-G7000A-4GTX: 3.47 W
IM-G7000A-4GSFP: 1.32 W
IM-G7000A-4PoE: 5.14 W (without PD power consumption)
Note: A 48 VDC external power supply is required to provide power to PoE devices.

Physical Characteristics

IP Rating: IP30 protection
Dimensions: 28.8 x 174.7 x 166.8 mm (1.13 x 6.88 x 6.57 in)
Weight: 220 g (0.49 lb)

MTBF (mean time between failures)

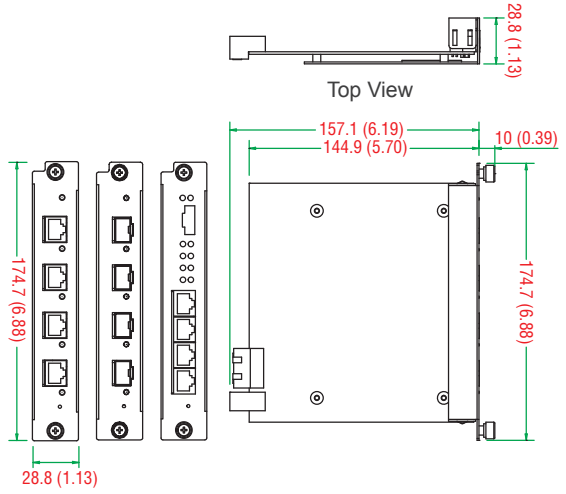
Time:
IM-G7000A-4GTX: 1,569,520 hrs
IM-G7000A-4GSFP: 1,544,084 hrs
IM-G7000A-4PoE: 394,348 hrs
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

IM-G7000A-4GTX: Gigabit Ethernet interface module with 4 10/100/1000BaseT(X) ports, -10 to 60°C operating temperature
IM-G7000A-4GSFP: Gigabit Ethernet interface module with 4 100/1000BaseSFP slots, -10 to 60°C operating temperature
IM-G7000A-4PoE: Gigabit Ethernet PoE+ interface module with 4 10/100/1000BaseT(X) ports, -10 to 60°C operating temperature
Note: See the SFP-1G, SFP-1G Copper, and SFP-1FE datasheets for SFP module product information.

Package Checklist

- IM-G7000A interface module
- Warranty card

ICS-G7526A/G7528A/G7826A/G7828A Series

24G+2 10GbE/24G+4 10GbE-port Layer 2/Layer 3 full Gigabit managed Ethernet switches

- 24 Gigabit Ethernet ports plus up to 4 10G Ethernet ports
- Up to 28 optical fiber connections (SFP slots)
- Fanless, -10 to 60°C operating temperature range
- Turbo Ring and Turbo Chain (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- Isolated redundant power inputs with universal 110/220 VAC power supply range
- Supports MXstudio for easy, visualized industrial network management
- V-ON™ ensures millisecond-level multicast data and video network recovery

Introduction

Process automation and transportation automation applications combine data, voice, and video, and consequently require high performance and high reliability. The ICS-G7526A/G7528A/G7826A/G7828A series full Gigabit backbone switches are equipped with 24 Gigabit Ethernet ports plus up to 4 10 Gigabit Ethernet ports, and the ICS-G7826A/G7828A support Layer 3 routing functionality to facilitate the deployment of applications across networks, making them ideal for large scale industrial networks. The ICS-G7526A/G7528A/G7826A/G7828A's full Gigabit capability increases bandwidth to provide high performance and the ability to quickly transfer large amounts of video, voice, and data across a network. The switches support the Turbo Ring, Turbo Chain, and RSTP/STP redundancy protocols, and are fanless and come with an isolated redundant power supply to increase system reliability and the availability of your network backbone.

Features and Benefits

- Layer 3 switching functionality to move data and information across networks (ICS-G7800A series)
- Command line interface (CLI) for quickly configuring major managed functions
- Supports advanced VLAN capability with Q-in-Q tagging
- Software based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP and Modbus/TCP protocols for device management and monitoring
- Compatible with EtherNet/IP and PROFINET protocols for transparent data transmission
- Redundant Gigabit Turbo Ring and Turbo Chain (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- IEEE 802.1Q VLAN and GVRP protocol to ease network planning
- QoS (IEEE 802.1p/1Q and TOS/DiffServ) to increase determinism
- Port Trunking for optimum bandwidth utilization
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Access control lists (ACL) increase the flexibility and security of network management (ICS-G7800A series)
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output
- Digital inputs for integrating sensors and alarms with IP networks
- Redundant, dual AC power inputs

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX
IEEE 802.3ae for 10 Gigabit Ethernet
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid Spanning Tree Protocol
IEEE 802.1s for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Software Features

Management: IPv4, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Q-in-Q VLAN, GVRP, IGMP v1/v2/v3, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Broadcast Storm Protection, Port Lock, Access Control Lists (ICS-G7800A series only)
Multicast Routing: DVMRP, PIM-DM, PIM-SM, PIM-SSM (ICS-G7800A series)
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Groups 1, 2, 3, 9
Routing Redundancy: VRRP (ICS-G7800A series)

Switch Properties

Priority Queues: 8
Max. Number of VLANs: 256
VLAN ID Range: VID 1 to 4094
IGMP Groups: 4096
MAC Table Size: 16 K
Packet Buffer Size: 12 Mbit
DRAM Size: 128 MB
Flash Size: 16 MB
Jumbo Frame Size: 9.6 KB

Interface

Gigabit Ethernet: 10/100/1000BaseT(X) or 100/1000BaseSFP slot
10 Gigabit Ethernet: 10GbE SFP+ slot
Console Port: USB-serial console (Type B connector)
Storage Port: USB storage (Type A connector for ABC-02-USB)
Alarm Contact: 1 relay output with current carrying capacity of 2 A @ 30 VDC
Digital Inputs: 1 input with the same ground, but electrically isolated from the electronics.
• +13 to +30 V for state “1”
• -30 to +1 V for state “0”
• Max. input current: 8 mA

Power Requirements

Input Voltage: 110 to 220 VAC
Operating Voltage: 85 to 264 VAC
Input Current:
ICS-G7526A/G7826A: Max. 0.83/0.47 A @ 110/220 VAC
ICS-G7528A/G7828A: Max. 0.99/0.65 A @ 110/220 VAC
Overload Current Protection: Present
Reverse Polarity Protection: Present

Physical Characteristics

IP Rating: IP30 protection
Dimensions: 440 x 44 x 386.9 mm (17.32 x 1.73 x 15.23 in)
Weight:
ICS-G7526A/G7826A: 5.3 kg (11.69 lb)
ICS-G7528A/G7828A: 5.5 kg (12.14 lb)
Installation: 19-inch rack mounting

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Rail Traffic: EN 50121-4
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa’s website for the most up-to-date certification status.

MTBF (mean time between failures)

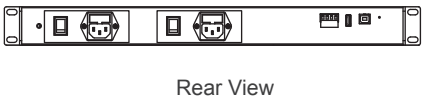
Time:
ICS-G7526A: 419,734 hrs
ICS-G7528A: 403,574 hrs
ICS-G7826A: 428,165 hrs
ICS-G7828A: 411,819 hrs
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

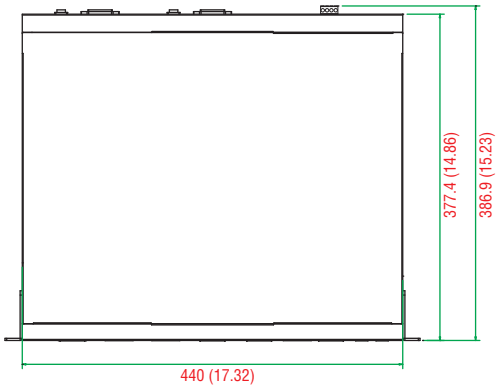
Dimensions

Unit: mm (inch)

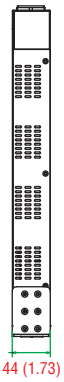


Rear View

Front View



Top View



Side View

Ordering Information

Available Models	Port Interface				Power Supply	
Standard Temperature (-10 to 60°C)	Gigabit Ethernet			10 Gigabit Ethernet	Isolated Power Supply 1	Isolated Power Supply 2
	10/100/1000BaseT(X)	100/1000BaseSFP*	Combo Port, 10/100/1000BaseT(X) or 100/1000BaseSFP*	10GbE SFP+*	HV: 85 to 264 VAC	HV: 85 to 264 VAC
ICS-G7526A/G7528A Series Layer 2 Switches						
ICS-G7526A-4GTXSFP-2XG-HV-HV	20	–	4	2	1	1
ICS-G7526A-8GSFP-4GTXSFP-2XG-HV-HV	12	8	4	2	1	1
ICS-G7526A-20GSFP-4GTXSFP-2XG-HV-HV	–	20	4	2	1	1
ICS-G7528A-4GTXSFP-4XG-HV-HV	20	–	4	4	1	1
ICS-G7528A-8GSFP-4GTXSFP-4XG-HV-HV	12	8	4	4	1	1
ICS-G7528A-20GSFP-4GTXSFP-4XG-HV-HV	–	20	4	4	1	1
ICS-G7826A/G7828A Series Layer 3 Switches						
ICS-G7826A-4GTXSFP-2XG-HV-HV	20	–	4	2	1	1
ICS-G7826A-8GSFP-4GTXSFP-2XG-HV-HV	12	8	4	2	1	1
ICS-G7826A-20GSFP-4GTXSFP-2XG-HV-HV	–	20	4	2	1	1
ICS-G7828A-4GTXSFP-4XG-HV-HV	20	–	4	4	1	1
ICS-G7828A-8GSFP-4GTXSFP-4XG-HV-HV	12	8	4	4	1	1
ICS-G7828A-20GSFP-4GTXSFP-4XG-HV-HV	–	20	4	4	1	1

Note: The ICS-G7526A/G7528A/G7826A/G7828A series supports 10GbE SFP+ and 100/1000BaseSFP slots. See the SFP-10G, SFP-1G, SFP-1G Copper, and SFP-1FE datasheets for SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-02-USB: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
Power Cords: See Appendix A for details

Package Checklist

- ICS-G7526A, ICS-G7528A, ICS-G7826A, or ICS-G7828A switch
- USB cable (Type A male to Type B male)
- 2 power cords (US type x 1, EU type x 1)
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

IKS-G6524A/G6824A Series

24G-port Layer 2 / Layer 3 full Gigabit managed Ethernet switches

- Layer 3 routing interconnects multiple LAN segments (IKS-G6824A series)
- 24 Gigabit Ethernet ports
- Up to 24 optical fiber connections (SFP slots)
- Fanless, -40 to 75°C operating temperature range (T models)
- Turbo Ring and Turbo Chain (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- Isolated redundant power inputs with universal 110/220 VAC power supply range
- Supports MXstudio for easy, visualized industrial network management
- V-ON™ ensures millisecond-level multicast data and video network recovery

Introduction

Process automation and transportation automation applications combine data, voice, and video, and consequently require high performance and high reliability. The IKS-G6524A/G6824A series full Gigabit backbone switches are equipped with 24 Gigabit Ethernet ports, and support Layer 3 routing functionality to facilitate the deployment of applications across networks, making them ideal for large scale industrial networks. The IKS-G6524A/G6824A's full Gigabit capability increases bandwidth to provide high performance and the ability to quickly transfer large amounts of video, voice, and data across a network. The switches support the Turbo Ring, Turbo Chain, and RSTP/STP redundancy protocols, and are fanless and come with an isolated redundant power supply to increase system reliability and the availability of your network backbone.

Features and Benefits

- Layer 3 switching functionality to move data and information across networks (IKS-G6824A series)
- Command line interface (CLI) for quickly configuring major managed functions
- Supports advanced VLAN capability with Q-in-Q tagging
- Software based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP and Modbus/TCP protocols for device management and monitoring
- Compatible with EtherNet/IP and PROFINET protocols for transparent data transmission
- Redundant Gigabit Turbo Ring and Turbo Chain (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- IEEE 802.1Q VLAN and GVRP protocol to ease network planning
- QoS (IEEE 802.1p/1Q and TOS/DiffServ) to increase determinism
- Port Trunking for optimum bandwidth utilization
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Access control lists (ACL) increase the flexibility and security of network management (IKS-G6824A series)
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output
- Digital inputs for integrating sensors and alarms with IP networks
- Redundant, dual AC power inputs

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid Spanning Tree Protocol
IEEE 802.1s for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2/v3, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Broadcast Storm Protection, Port Lock, Access Control Lists (IKS-G6824A only)
Multicast Routing: DVMRP, PIM-DM, PIM-SM, PIM-SSM (IKS-G6824A series)
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Groups 1, 2, 3, 9
Routing Redundancy: VRRP (IKS-G6824A series)

Switch Properties

Priority Queues: 8
Max. Number of VLANs: 256
VLAN ID Range: VID 1 to 4094
IGMP Groups: 4096
MAC Table Size: 16 K
Packet Buffer Size: 12 Mbit
DRAM Size: 128 MB
Flash Size: 16 MB
Jumbo Frame Size: 9.6 KB

Interface

Gigabit Ethernet: 10/100/1000BaseT(X) or 100/1000BaseSFP slot
Console Port: USB-serial console (Type B connector)
Storage Port: USB storage (Type A connector for ABC-02-USB)
Alarm Contact: 1 relay output with current carrying capacity of 2 A @ 30 VDC
Digital Inputs: 1 input with the same ground, but electrically isolated from the electronics.
• +13 to +30 V for state “1”
• -30 to +1 V for state “0”
• Max. input current: 8 mA

Power Requirements

Input Voltage: 110 to 220 VAC
Operating Voltage: 85 to 264 VAC
Input Current: Max. 0.67/0.38 A @ 110/220 VAC
Overload Current Protection: Present
Reverse Polarity Protection: Present

Physical Characteristics

IP Rating: IP30 protection
Dimensions: 440 x 44 x 386.9 mm (17.32 x 1.73 x 15.23 in)
Weight: 5.1 kg (11.25 lb)
Installation: 19-inch rack mounting

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Rail Traffic: EN 50121-4
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa’s website for the most up-to-date certification status.

MTBF (mean time between failures)

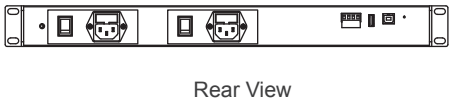
Time:
IKS-G6524A: 460,854 hrs
IKS-G6824A: 471,418 hrs
Standard: Telcordia (Bellcore), GB

Warranty

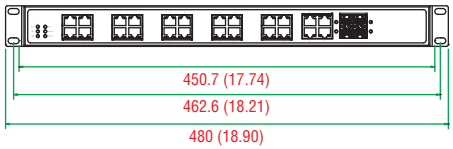
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

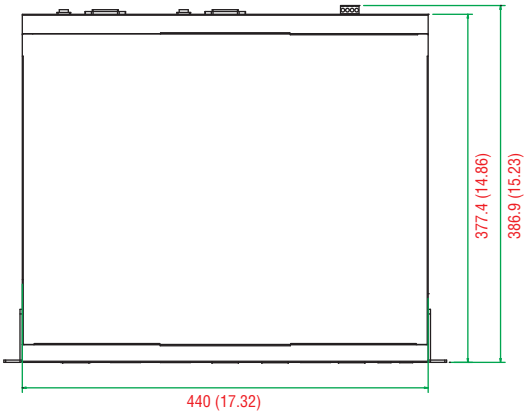
Unit: mm (inch)



Rear View



Front View



Top View

Side View

Ordering Information

Available Models		Port Interface			Power Supply	
		Gigabit Ethernet			Isolated Power Supply 1	Isolated Power Supply 2
Standard Temperature (-10 to 60°C)	Wide Temperature (-40 to 75°C)	10/100/1000 BaseT(X)	100/1000 BaseSFP*	Combo Port, 10/100/1000 BaseT(X) or 100/1000 BaseSFP*	HV: 85 to 264 VAC	HV: 85 to 264 VAC
IKS-G6524A Series Layer 2 Switches						
IKS-G6524A-4GTXSFP-HV-HV	IKS-G6524A-4GTXSFP-HV-HV-T	20	–	4	1	1
IKS-G6524A-8GSFP-4GTXSFP-HV-HV	IKS-G6524A-8GSFP-4GTXSFP-HV-HV-T	12	8	4	1	1
IKS-G6524A-20GSFP-4GTXSFP-HV-HV	IKS-G6524A-20GSFP-4GTXSFP-HV-HV-T	–	20	4	1	1
IKS-G6824A Series Layer 3 Switches						
IKS-G6824A-4GTXSFP-HV-HV	IKS-G6824A-4GTXSFP-HV-HV-T	20	–	4	1	1
IKS-G6824A-8GSFP-4GTXSFP-HV-HV	IKS-G6824A-8GSFP-4GTXSFP-HV-HV-T	12	8	4	1	1
IKS-G6824A-20GSFP-4GTXSFP-HV-HV	IKS-G6824A-20GSFP-4GTXSFP-HV-HV-T	–	20	4	1	1

*The IKS-G6524A/G6824A series supports 100/1000BaseSFP slots. See SFP-1G, SFP-1G Copper, and SFP-1FE datasheets for SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-02-USB: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
Power Cords: See Appendix A for details

Package Checklist

- IKS-G6524A or IKS-G6824A switch
- USB cable (Type A male to Type B male)
- 2 power cords (US type x 1, EU type x 1)
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

IKS-6726A/6728A Series

24+2G/24+4G-port modular managed Ethernet switches

- 2/4 Gigabit plus 24 Fast Ethernet ports for copper and fiber
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- Isolated redundant power inputs with universal 24/48 VDC or 110/220 VAC power supply
- Modular design lets you choose from a variety of media combinations
- -40 to 75°C operating temperature range
- Supports MXstudio for easy, visualized industrial network management
- V-ON™ ensures millisecond-level multicast data and video network recovery

Introduction

The IKS-6726A/6728A series of industrial rackmount Ethernet switches are designed to meet the rigorous demands of mission critical applications for industry and business, such as traffic control systems and maritime applications. The IKS-6726A/6728A's Gigabit and fast Ethernet backbone, redundant ring, and 24/48 VDC or 110/220 VAC dual isolated redundant power supplies increase the reliability of your communications and save on cabling and wiring costs. The modular design of the IKS-6726A/6728A also makes network planning easy, and allows greater flexibility by letting you install up to 4 Gigabit ports and 24 fast Ethernet ports.

Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions
- Software-based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP and Modbus/TCP protocols for device management and monitoring
- Compatible with EtherNet/IP and PROFINET protocols for transparent data transmission
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- TACACS+, IEEE 802.1X, SNMPv3, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status with "Lock port" to restrict access to authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email, relay output
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by web browser, Telnet/serial console, CLI, Windows utility, and ABC-02-USB automatic backup configurator

Specifications

Technology

Standards:

IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Modular Rackmount Ethernet Switch System, IKS-6726A/6728A

IKS-6726A-2GTXSFP

IKS-6728A-4GTXSFP

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2/v3, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Broadcast Storm Protection, Port Lock
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 2048
MAC Table Size: 16 K
Packet Buffer Size: 12 Mbit
Jumbo Frame Size: 9.6 KB

Interface

Fast Ethernet: 8-port 10/100Base T(X) and 2 modular slots for any 8-port or 6-port Interface Modules with 10/100BaseT(X), 100BaseFX (SC/ST connector), or 100Base SFP
Note: See the IM-6700A datasheet for Fast Ethernet module product information.
Gigabit Ethernet: 2- or 4-port 10/100/1000BaseT(X) or 100/1000Base SFP
Console Port: USB-serial console (Type B connector)
Storage Port: USB storage (Type A connector for ABC-02-USB)
Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Power Requirements

Input Voltage:
• 24 VDC models: 24 VDC
• 48 VDC models: 48 VDC
• HV models: 110/220 VAC
Operating Voltage:
• 24 VDC models: 18 to 36 VDC
• 48 VDC models: 36 to 72 VDC
• HV models: 85 to 264 VAC
Input Current: (without IM-6700A modules installed)
• Max. 0.36 A @ 24 VDC
• Max. 0.19 A @ 48 VDC
• Max. 0.28/0.14 A @ 110/220 VAC
Overload Current Protection: Present
Reverse Polarity Protection: Present

Physical Characteristics

IP Rating: IP30 protection
Dimensions: 440 x 44 x 280 mm (17.32 x 1.37 x 11.02 in)
Weight: 4100 g (9.05 lb)
Installation: 19-inch rack mounting

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Rail Traffic: EN 50121-4
Marine: DNV, GL, LR, ABS, NK
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time:
IKS-6726A: 149,151 hrs
IKS-6728A: 148,687 hrs
Standard: Telcordia (Bellcore), GB

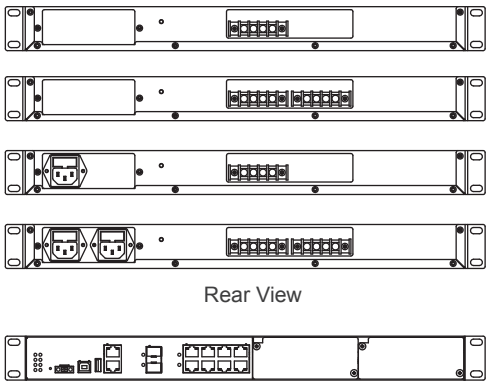
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

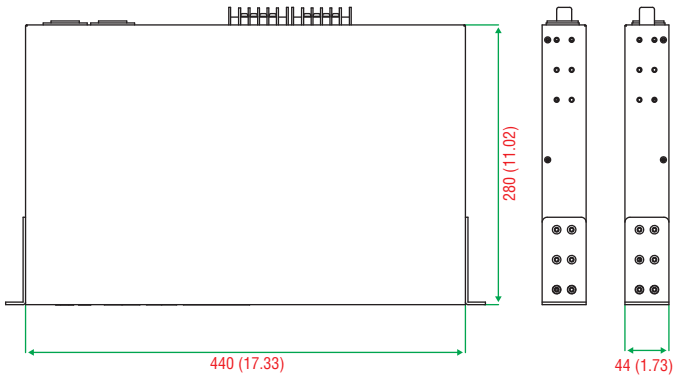
Unit: mm (inch)

IKS-6726A-2GTXSFP Series



Rear View

Front View



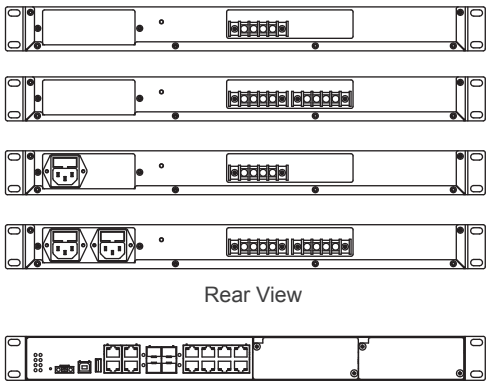
Top View

Side View

Dimensions

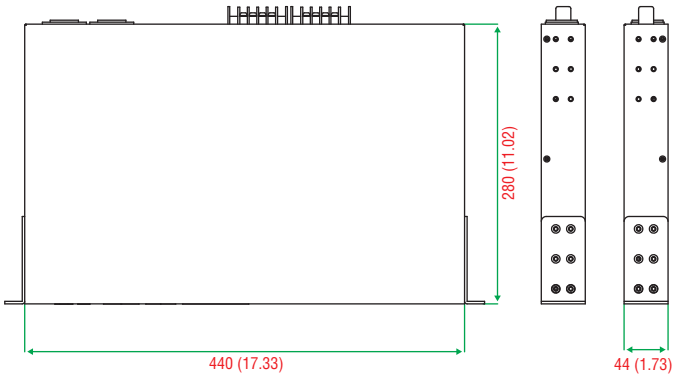
Unit: mm (inch)

IKS-6728A-4GTXSFP Series



Rear View

Front View



Top View

Side View

Ordering Information

Step 1: Select Ethernet switch system

IKS-6726A/6728A with power supply

Step 2: Select interface modules

IM-6700A modules (Fast Ethernet)

Note: The IKS-6726A/6728A Ethernet switch system is delivered without interface modules. See the IM-6700A datasheet to determine which interface modules are suitable for your application.

IKS-6726A/6728A Modular Rackmount Ethernet Switch System

Modular managed rackmount Ethernet switch with 8 fixed 10/100BaseT(X) ports, 2 or 4 Gigabit Copper/SFP combo ports, and 2 slots for Fast Ethernet modules. Support up to 24+4G ports, -40 to 75°C operating temperature.

Available Models	Port Interface				Power Supply					
	Gigabit Ethernet	Fast Ethernet			Isolated Power Supply 1			Isolated Power Supply 2		
Front Cabling, Wide Temperature (-40 to 75 °C)	10/100/1000 BaseT(X) or 100/1000BaseSFP*	10/100BaseT(X)	100BaseFX	100BaseSFP*	HV (85 to 264 VAC)	48 VDC	24 VDC	HV (85 to 264 VAC)	48 VDC	24 VDC
IKS-6726A Series										
IKS-6726A-2GTXSFP-HV-T	2	Up to 24	Up to 12	Up to 18	1	–	–	–	–	–
IKS-6726A-2GTXSFP-HV-HV-T	2	Up to 24	Up to 12	Up to 18	1	–	–	1	–	–
IKS-6726A-2GTXSFP-24-T	2	Up to 24	Up to 12	Up to 18	–	–	1	–	–	–
IKS-6726A-2GTXSFP-24-24-T	2	Up to 24	Up to 12	Up to 18	–	–	1	–	–	1
IKS-6726A-2GTXSFP-48-T	2	Up to 24	Up to 12	Up to 18	–	1	–	–	–	–
IKS-6726A-2GTXSFP-48-48-T	2	Up to 24	Up to 12	Up to 18	–	1	–	–	1	–
IKS-6728A Series										
IKS-6728A-4GTXSFP-HV-T	4	Up to 24	Up to 12	Up to 20	1	–	–	–	–	–
IKS-6728A-4GTXSFP-HV-HV-T	4	Up to 24	Up to 12	Up to 20	1	–	–	1	–	–
IKS-6728A-4GTXSFP-24-T	4	Up to 24	Up to 12	Up to 20	–	–	1	–	–	–
IKS-6728A-4GTXSFP-24-24-T	4	Up to 24	Up to 12	Up to 20	–	–	1	–	–	1
IKS-6728A-4GTXSFP-48-T	4	Up to 24	Up to 12	Up to 20	–	1	–	–	–	–
IKS-6728A-4GTXSFP-48-48-T	4	Up to 24	Up to 12	Up to 20	–	1	–	–	1	–

Note: The IKS-6726A/6728A series supports 100BaseSFP and 100/1000BaseSFP slots. See the SFP-1G and SFP-1FE datasheets for SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-02-USB: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
Power Cords: See Appendix A for details

Package Checklist

- IKS-6726A or IKS-6728A switch
- AC power cord (HV model only)
- Protective caps for unused ports
- 2 rackmount ears
- USB cable (Type A male to Type B male)
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

IM-6700A Series

Fast Ethernet modules for IKS-6726A-2GTXSFP/IKS-6728A-4GTXSFP/ IKS-6728A-8PoE-4GTXSFP series switches

Specifications

Fast Ethernet Interface Modules, IM-6700A series

IM-6700A-8TX

IM-6700A-8SFP*

IM-6700A-6SSC
IM-6700A-6MSC

IM-6700A-6MST

IM-6700A-2MSC4TX
IM-6700A-2SSC4TX

IM-6700A-2MST4TX

IM-6700A-4MSC2TX
IM-6700A-4SSC2TX

IM-6700A-4MST2TX

IM-6700A-8PoE**

*See the SFP-1FE datasheet for Fast Ethernet module product information.
**IM-6700A-8PoE is supported by the IKS-6728A-8PoE series

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100BaseFX ports (SC/ST or SFP LC connector)
PoE Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection, IEEE 802.3af/at standards, Mode A

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Power Requirements

Power Consumption:
IM-6700A-8TX: 1.21 W
IM-6700A-8PoE: 1.21 W (w/o PoE output)
IM-6700A-8SFP: 0.92 W
IM-6700A-6MSC/6MST/6SSC: 7.57 W
IM-6700A-4MSC2TX/4MST2TX/4SSC2TX: 5.28 W
IM-6700A-2MSC4TX/2MST4TX/2SSC4TX: 3.19 W

Physical Characteristics

Weight:
IM-6700A-8TX: 225 g (0.50 lb)
IM-6700A-8PoE: 260 g (0.58 lb)
IM-6700A-8SFP: 295 g (0.65 lb)
IM-6700A-6MSC-6MSC/6MST/6SSC: 390 g (0.86 lb)
IM-6700A-4MSC2TX-4MSC2TX/4MST2TX/4SSC2TX: 270 g (0.60 lb)
IM-6700A-2MSC4TX-2MSC4TX/2MST4TX/2SSC4TX: 270 g (0.60 lb)

Reliability

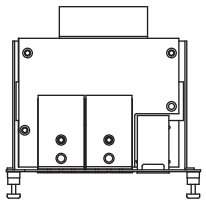
MTBF (mean time between failures):
IM-6700A-8TX: 10,412,400 hrs
IM-6700A-8SFP: 3,510,110 hrs
IM-6700A-6MSC: 366,119 hrs
IM-6700A-6MST: 365,741 hrs
IM-6700A-6SSC: 365,741 hrs
IM-6700A-4MSC2TX: 530,268 hrs
IM-6700A-4MST2TX: 537,942 hrs
IM-6700A-2MSC4TX: 1,031,180 hrs
IM-6700A-2MST4TX: 1,031,180 hrs
IM-6700A-2SSC4TX: 1,031,180 hrs
IM-6700A-8PoE: 338,800 hrs
Database: Telcordia (Bellcore), GB

Warranty

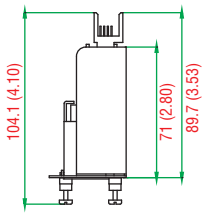
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

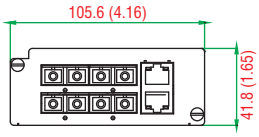
Unit: mm (inch)



Top View



Side View



Front View

Ordering Information

Compatible Rackmount Ethernet Switch Systems

Modular Rackmount Ethernet Switch System:

IKS-6726A-2GTXSFP

IKS-6728A-4GTXSFP

IKS-6728A-8PoE

Fast Ethernet Modules, IM-6700A Series

Available Models	Port Interface				
	10/100BaseT(X)	100BaseFX			100BaseSFP*
		Multi-Mode, SC Connector	Multi-Mode, ST Connector	Single-Mode, SC Connector	
IM-6700A-8TX	8	–	–	–	–
IM-6700A-8SFP	–	–	–	–	8
IM-6700A-6MSC	–	6	–	–	–
IM-6700A-6MST	–	–	6	–	–
IM-6700A-6SSC	–	–	–	6	–
IM-6700A-4MSC2TX	2	4	–	–	–
IM-6700A-4MST2TX	2	–	4	–	–
IM-6700A-4SSC2TX	2	–	–	4	–
IM-6700A-2MSC4TX	4	2	–	–	–
IM-6700A-2MST4TX	4	–	2	–	–
IM-6700A-2SSC4TX	4	–	–	2	–
IM-6700A-8PoE	8 (PoE+ ports)	–	–	–	–

Package Checklist

- IM-6700A series interface module
- Warranty card

EDS-728/828

Award-winning Product

24+4G-port Layer 2/Layer 3 Gigabit modular managed Ethernet switches

- 4 Gigabit plus 24 Fast Ethernet ports for copper and fiber
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Easy network management by web browser, CLI, Telnet/serial console, Windows utility, and ABC-01
- Layer 3 routing interconnects multiple LAN segments (EDS-828)
- Supports MXstudio for easy, visualized industrial network management

Introduction

The EDS-728/828 modular Gigabit Ethernet switch features a versatile modular design that allows different combinations of fiber and copper modules, creating a wide array of connection options ideal for any automation network. The modular design lets you install up to 4 Gigabit ports and 24 Fast Ethernet ports. The EDS-728/828 is specially designed for redundant Gigabit network backbones and uses a modular configuration to provide a high degree of flexibility for network expansion. Top network performance, security, and reliability is assured through the EDS-728/828's advanced management and security features. The EDS-728/828 also features industrial-grade construction, a console port for automatic configuration backup, and an angled LED troubleshooting panel that can be conveniently viewed from both horizontal and vertical orientations. In addition to Layer 2 features, the EDS-828 is a high-performance Layer 3 Ethernet switch designed for network routing. The improved hardware technology built into the EDS-828 replaces the software logic used by traditional routers, offering better performance, and making the switch ideal for large-scale local area networks.

Features and Benefits

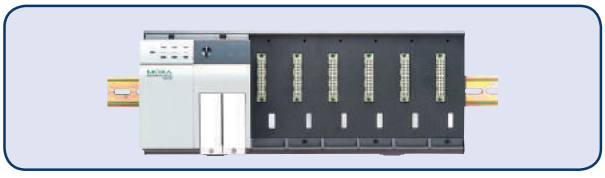
- Layer 3 switching functionality to move data and information across networks (EDS-828)
- Command Line Interface (CLI) for quickly configuring major managed functions
- Supports advanced VLAN capability with Q-in-Q tagging
- Software-based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP and Modbus/TCP protocols for device management and monitoring
- Compatible with PROFINET protocol for transparent data transmission
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- IEEE 802.1Q VLAN and GVRP protocol to ease network planning
- QoS (IEEE 802.1p/1Q and TOS/DiffServ) to increase determinism
- Port Trunking for optimum bandwidth utilization
- Access Control Lists (ACL) increase the flexibility and security of network management (EDS-828)
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output
- Digital inputs for integrating sensors and alarms with IP networks
- Redundant, dual DC power inputs
- Configurable by Web browser, Telnet/serial console, CLI, Windows utility, and ABC-01 automatic backup configurator

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid Spanning Tree Protocol
IEEE 802.1s for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Layer 2/Layer 3 Modular Managed Ethernet Switch System, EDS-72810G/82810G



Software Features

Management: IPv4, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control

Filter: 802.1Q VLAN, VLAN Unaware, Q-in-Q VLAN, GVRP, IGMP v1/v2, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation, VRRP (EDS-828 only)
Security: RADIUS, TACACS+, SSL, SSH, Broadcast Storm Protection, Port Lock, Access Control Lists (EDS-828 only)
Multicast Routing: DVMRP, PIM-DM (EDS-828)
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Groups 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
MAC Table Size: 16 K
Packet Buffer Size: 32 MB

Interface

Fast Ethernet: 6 slots for any combination of 4-port interface modules, 10/100BaseT(X) or 100BaseFX
Gigabit Ethernet: 2 slots for any combination of 2-port interface modules, 10/100/1000BaseT(X) or 1000BaseSFP slot
Console Port: RS-232 (RJ45 connector)
System LED Indicators: STAT, PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL, T.RING
Mode LED Indicators: LNK/ACT, FDX/HDX, RING PORT, COUPLER PORT, SPEED
Alarm Contact: 2 relay outputs with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 inputs with the same ground, but electrically isolated from the electronics.
- +13 to +30 V for state "1"
- -30 to +3 V for state "0"
- Max. input current: 8 mA

Power Requirements

Input Voltage: 24 VDC, redundant dual inputs
Operating Voltage: 12 to 45 VDC
Input Current: 0.82 A @ 24 V
Overload Current Protection: Present
Connection: 2 removable 6-contact terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

IP Rating: IP30 protection
Dimensions: 362.4 x 142.5 x 128 mm (14.27 x 5.61 x 5.04 in)
Weight: 1950 g (4.30 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508, UL 60950-1, CSA C22.2 No. 60950-1, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Marine: DNV, GL, LR, ABS, NK
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

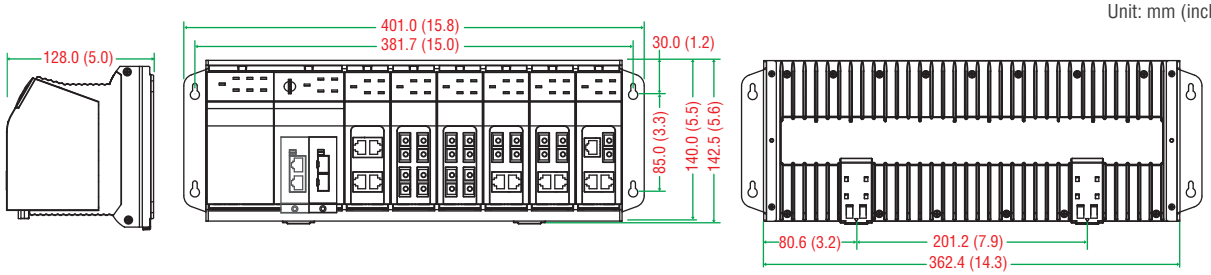
Time: 191,203 hrs
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View

Ordering Information

Step 1: Select Ethernet switch system → **Step 2: Select interface modules**

EDS-72810G/82810G → **IM series (Gigabit or Fast Ethernet)**

Note: The EDS-72810G/82810G switch system is delivered without interface modules. See the IM series and SFP-1G datasheets for Gigabit and Fast Ethernet interface module product information.

Available Models

EDS-72810G/82810G: Layer 2/Layer 3 modular managed Ethernet switch system with 6 slots for 4-port Fast Ethernet interface modules and 2 slots for 2-port Gigabit interface modules, for up to 24+4G ports

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
DR-4524/75-24/120-24: 45/75/120 W DIN-rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-rail 24 VDC power supplies, -20 to 70°C operating temperature
RK-4U: 4U-high 19-inch rack-mounting kit
WK-32: Wall-mounting kit for the EDS-728/828 series

Package Checklist

- EDS-728/828 switch
- Serial Cable: CN20070
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

IM Series

2-port Gigabit Ethernet and 4-port Fast Ethernet interface modules for EDS-728/828 series Ethernet switches

Specifications

Gigabit Ethernet Interface Modules, IM-2G Series

IM-2GTX

IM-2GSFP

Interface

Fiber Ports: 1000BaseSFP slot
RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed and auto MDI/MDI-X connection
LED Indicators: Port status
Note: See the SFP-1G datasheet for Gigabit Ethernet SFP module product information.

Power Requirements

Power Consumption (@ 24 V):
IM-2GTX: 2.96 W
IM-2GSFP: 3.04 W

Physical Characteristics

Dimensions: 24 x 65.9 x 101.1 mm (0.94 x 2.59 x 3.98 in)
Weight:
IM-2GTX: 150 g (0.33 lb)
IM-2GSFP: 148 g (0.33 lb)

MTBF (mean time between failures)

Time:
IM-2GTX: 417,521 hrs
IM-2GSFP: 424,955 hrs
Database: Telcordia (Bellcore), GB

Fast Ethernet Interface Modules, IM Series

IM-4TX

IM-2MSC/2TX
IM-2SSC/2TX

IM-2MST/2TX

IM-1LSC/3TX

IM-4MSC
IM-4SSC

IM-4MST

Interface

Fiber Ports: 100BaseFX ports (SC/ST connector)
RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
LED Indicators: PWR, P1, P2, P3, P4 port status

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Power Requirements

Power Consumption (@ 24 V):
IM-4TX: 1.29 W
IM-2MSC/2TX: 2.06 W
IM-2MST/2TX: 2.06 W
IM-2SSC/2TX: 2.06 W
IM-1LSC/3TX: 2.12 W
IM-4MSC: 6.6 W
IM-4MST: 6.6 W
IM-4SSC: 6.6 W

Physical Characteristics

Housing: IP30 protection
Dimensions: 40 x 127.8 x 100 mm (1.57 x 5.03 x 3.94 in)
Weight:
IM-4TX: 215 g (0.48 lb)
IM-2MSC/2TX: 245 g (0.54 lb)
IM-2MST/2TX: 250 g (0.56 lb)
IM-2SSC/2TX: 245 g (0.54 lb)
IM-1LSC/3TX: 235 g (0.52 lb)
IM-4MSC: 250 g (0.56 lb)
IM-4MST: 270 g (0.60 lb)
IM-4SSC: 270 g (0.60 lb)

MTBF (mean time between failures)

Time:
IM-4TX: 4,403,579 hrs
IM-2MSC/2TX, IM-2MST/2TX, IM-2SSC/2TX: 1,011,453 hrs
IM-1LSC/3TX: 3,924,924 hrs
IM-4MSC, IM-4MST, IM-4SSC: 696,138 hrs
Standard: Telcordia (Bellcore), GB

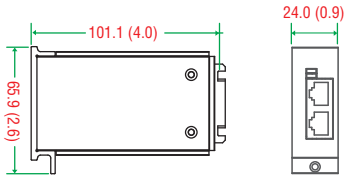
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

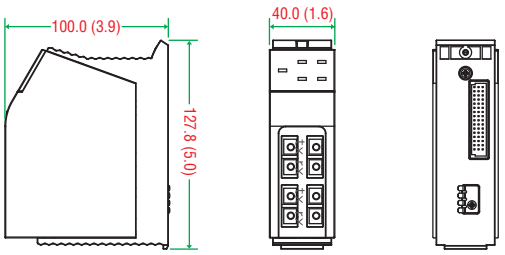
Unit: mm (inch)

Gigabit Ethernet Interface Modules



Side View Front View

Fast Ethernet Interface Modules



Side View Front View Rear View

Ordering Information

Available Models (0 to 60°C)	Port Interface						
	Gigabit Ethernet		Fast Ethernet				
				100BaseFX			
	10/100/1000BaseT(X)	1000BaseSFP*	10/100BaseT(X)	Multi-Mode, SC Connector	Multi-Mode, ST Connector	Single-Mode, SC Connector	Single-Mode, SC Connector, 80 km
IM-2G Series							
IM-2GTX	2	–	–	–	–	–	–
IM-2GSFP	–	2	–	–	–	–	–
IM Series							
IM-4TX	–	–	4	–	–	–	–
IM-4MSC	–	–	–	4	–	–	–
IM-4MST	–	–	–	–	4	–	–
IM-2MSC/2TX	–	–	2	2	–	–	–
IM-2MST/2TX	–	–	2	–	2	–	–
IM-4SSC	–	–	–	–	–	4	–
IM-2SSC/2TX	–	–	2	–	–	2	–
IM-1LSC/3TX	–	–	3	–	–	–	1

*See the SFP-1G datasheet for Gigabit Ethernet SFP module product information.

Package Checklist

- IM series interface modules
- Warranty card

EDS-608/611/616/619 Series

8, 8+3G, 16, 16+3G-port compact modular managed Ethernet switches

- Up to 19 optical fiber connections in a compact switch (EDS-619)
- Modular design with 4-port copper/fiber combinations
- Hot swap media modules for continuous operation
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Easy network management by web browser, CLI, Telnet/serial console, Windows utility, and ABC-01
- Supports MXstudio for easy, visualized industrial network management

Introduction

The versatile modular design of the compact EDS-600 series Ethernet switch allows users to combine fiber and copper modules to create switch solutions suitable for any automation network. The EDS-600's modular design lets you install up to 3 Gigabit Ethernet ports and 16 Fast Ethernet ports, and the advanced Turbo Ring and Turbo Chain (recovery time < 20 ms) technology, RSTP/STP, and MSTP helps increase the reliability and availability of your industrial Ethernet network. Models with an extended operating temperature range of -40 to 75°C are also available. The EDS-600 series supports several reliable and intelligent functions, including IEEE 1588 PTPv2, EtherNet/IP, Modbus/TCP, LLDP, DHCP Option 82, SNMP Inform, QoS, IGMP snooping, VLAN, TACACS+, IEEE 802.1X, HTTPS, SSH, SNMPv3, and more, making the Ethernet switches suitable for any harsh industrial environment.

Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions
- Hot swap media modules for continuous operation
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- SNMP Inform for ensuring reliable event management
- LLDP for automated topology discovery
- DHCP Option 82 for IP address assignment with different policies
- Software-based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- Support EtherNet/IP and Modbus/TCP protocols for device management and monitoring
- Compatible with PROFINET protocol for transparent data transmission
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Broadcast Storm Protection, Port Lock
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit

Interface

Fast Ethernet: 2 or 4 slots for any combination of 4-port interface modules, 10/100BaseT(X) or 100BaseFX
Gigabit Ethernet: 3 10/100/1000BaseT(X) with 100/1000BaseSFP combo slots (EDS-611 and EDS-619 only)
Console Port: RS-232 (RJ45 connector)
DIP Switches: Turbo Ring, Master, Coupler, Reserve
System LED Indicators: PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL, G1/G2/G3 (EDS-611 and EDS-619 only)
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 1 input with the same ground, but electrically isolated from the electronics.
• +13 to +30 V for state "1"
• -30 to +3 V for state "0"
• Max. input current: 8 mA

Power Requirements

Input Voltage: 12/24/48 VDC, redundant dual inputs
Input Current: (without CM-600 modules installed)
EDS-608: 0.16 A @ 24 V
EDS-611: 0.31 A @ 24 V
EDS-616: 0.25 A @ 24 V
EDS-619: 0.31 A @ 24 V
Overload Current Protection: Present
Connection: 1 removable 5-contact and 1 removable 6-contact terminal block
Reverse Polarity Protection: Present

Physical Characteristics

IP Rating: IP30 protection
Dimensions:
EDS-608/611 Series: 124.9 x 151 x 157.2 mm (4.92 x 5.95 x 6.19 in)
EDS-616/619 Series: 185 x 151 x 157.2 mm (7.28 x 5.95 x 6.19 in)
Weight:
EDS-608: 2080 g (4.59 lb)
EDS-611: 2260 g (4.99 lb)
EDS-616: 2780 g (6.13 lb)
EDS-619: 2950 g (6.51 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508, UL 60950-1, EN 60950-1
Hazardous Location: UL/cUL Class 1 Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nA nC IIC T4 Gc
EMC: EN 55022/24, EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Traffic Control: NEMA TS2
Rail Traffic: EN 50121-4
Marine: DNV, GL, LR, ABS, NK
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time:
EDS-608: 596,219 hrs
EDS-611: 483,344 hrs
EDS-616: 546,937 hrs
EDS-619: 475,816 hrs
Standard: Telcordia (Bellcore), GB

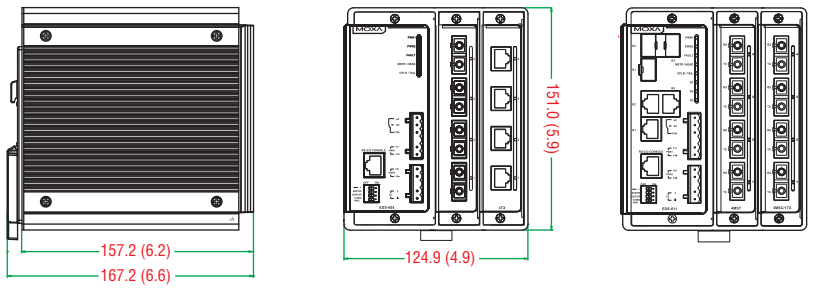
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

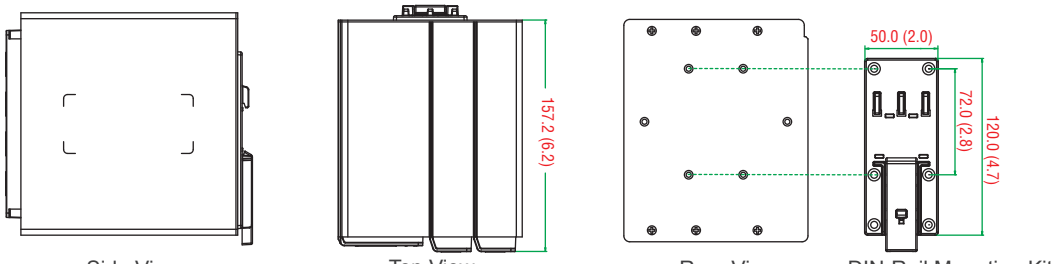
Dimensions

Unit: mm (inch)

EDS-608/611 Series



Side View
Front View

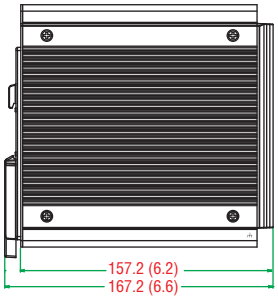


Side View
Top View
Rear View
DIN-Rail Mounting Kit

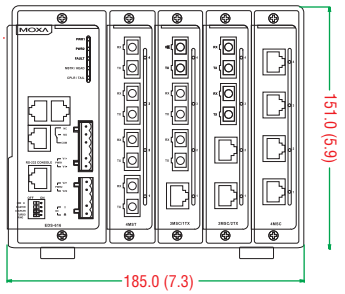
Dimensions

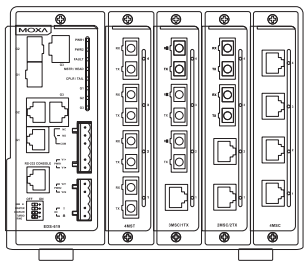
Unit: mm (inch)

EDS-616/619 Series

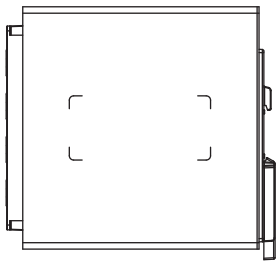


Side View

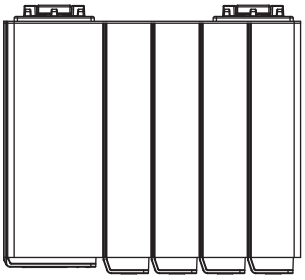




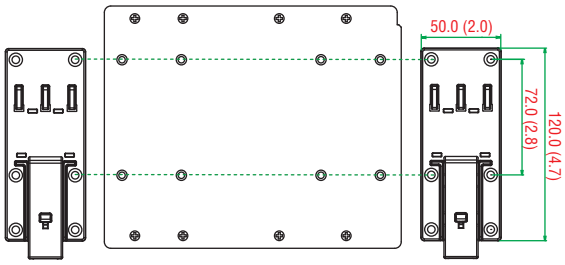
Front View



Side View



Top View



Rear View

DIN-Rail Mounting Kit

Ordering Information

Step 1: Select Ethernet switch system

EDS-608/611/616/619

Step 2: Select interface modules

CM-600 Series (Fast Ethernet)

Note: The EDS-600 switch system is delivered without interface modules. See the CM-600 datasheet for Fast Ethernet interface module product information.

Available Models		Total No. of Ports	Port Interface		
			Gigabit Ethernet	Fast Ethernet	
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)		10/100/1000BaseT(X) or 100/1000BaseSFP*	Slots	10/100BaseT(X) and/or 100BaseFX
EDS-608	EDS-608-T	8	–	2	up to 8
EDS-611	EDS-611-T	11	3	2	up to 8
EDS-616	EDS-616-T	16	–	4	up to 16
EDS-619	EDS-619-T	19	3	4	up to 16

*The EDS-611/619 series supports 3 100/1000BaseSFP slots. See the SFP-1G and SFP-1FE datasheets for Gigabit/Fast Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500,1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
DR-4524/75-24/120-24: 45/75/120 W DIN-rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-75: Wall-mounting kit, 2 plates with 8 screws
AVK-17: Anti-vibration wiring Kit

Package Checklist

- EDS-608 or EDS-611 or EDS-616 or EDS-619 switch
- Serial Cable: CN20070
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

CM-600 Series

4-port Fast Ethernet interface modules for EDS-600 series Ethernet switches

Specifications

Fast Ethernet Interface Modules, CM-600 Series

CM-600-4TX
CM-600-4TX-BP
CM-600-4TX-PTP

CM-600-4MSC
CM-600-4SSC

CM-600-4MST

CM-600-3MSC/1TX
CM-600-3SSC/1TX

CM-600-3MST/1TX

CM-600-2MSC/2TX
CM-600-2SSC/2TX

CM-600-2MST/2TX

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100BaseFX ports (SC/ST connector)

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Power Requirements

Power Consumption:
CM-600-4TX: 0.61 W
CM-600-4TX-BP: 2.38 W
CM-600-4TX-PTP: 3.46 W
CM-600-4MSC/4MST/4SSC: 2.44 W
CM-600-3MSC/1TX, -3MST/1TX, -3SSC/1TX: 2 W
CM-600-2MSC/2TX, -2MST/2TX, -2SSC/2TX: 1.56 W

Physical Characteristics

IP Rating: IP30 protection
Dimensions: 29.7 x 144.4 x 144.8 mm (1.17 x 5.69 x 5.7 in)
Weight:
CM-600-4TX: 190 g (0.42 lb)
CM-600-4TX-BP: 240 g (0.53 lb)
CM-600-4TX-PTP: 185 g (0.41 lb)
CM-600-4MSC, -4MST, -4SSC: 240 g (0.53 lb)
CM-600-3MSC/1TX, -3MST/1TX, -3SSC/1TX: 230 g (0.51 lb)
CM-600-2MSC/2TX, -2MST/2TX, -2SSC/2TX: 230 g (0.51 lb)

MTBF (mean time between failures)

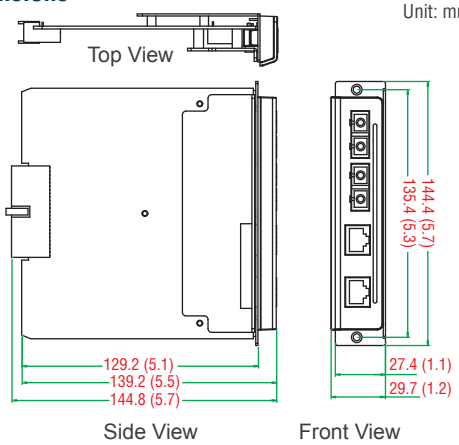
Time: 740,661 hrs
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models (-40 to 75°C)	Port Interface			
	10/100BaseT(X)	100BaseFX		
		Multi-Mode, SC Connector	Multi-Mode, ST Connector	Single-Mode, SC Connector
CM-600-4TX	4	–	–	–
CM-600-4TX-BP*	4	–	–	–
CM-600-4TX-PTP*	4	–	–	–
CM-600-4MSC	–	4	–	–
CM-600-4MST	–	–	4	–
CM-600-4SSC	–	–	–	4
CM-600-3MSC/1TX	1	3	–	–
CM-600-3MST/1TX	1	–	3	–
CM-600-3SSC/1TX	1	–	–	3
CM-600-2MSC/2TX	2	2	–	–
CM-600-2MST/2TX	2	–	2	–
CM-600-2SSC/2TX	2	–	–	2

*The CM-600-4TX-BP supports the bypass relay function on each port; the CM-600-4TX-PTP supports the IEEE 1588 PTPv2 protocol on each port.

Package Checklist

- CM-600 interface module
- Warranty card

EDS-G508E/G512E/G516E Series

8G/12G/16G-port full Gigabit managed Ethernet switches

- Up to 12 10/100/1000BaseT(X) ports and 4 100/1000BaseSFP ports (EDS-G516E)
- Turbo Ring and Turbo Chain (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- RADIUS, TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- EtherNet/IP, PROFINET, and Modbus/TCP protocols supported for device management and monitoring
- Supports MXstudio for easy, visualized industrial network management
- V-ON™ ensures millisecond-level multicast data and video network recovery

Introduction

The EDS-G500E series is equipped with 8/12/16 Gigabit Ethernet ports and up to 4 fiber optic ports, making it ideal for upgrading an existing network to Gigabit speed or building a new full Gigabit backbone. Gigabit transmission increases bandwidth for higher performance and transfers large amounts of triple-play services across a network quickly. Redundant Ethernet Turbo Ring, Turbo Chain, RSTP/STP, and MSTP increase system reliability and the availability of your network backbone. The EDS-G500E series is designed especially for communication demanding applications, such as video and process monitoring, ITS, and DCS systems, all of which can benefit from a scalable backbone construction.

Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Software-based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP, PROFINET, and Modbus/TCP protocols for device management and monitoring
- Turbo Ring and Turbo Chain (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output
- ABC-02-USB (Automatic Backup Configurator) for system configuration backup/restore and firmware upgrade.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2/v3, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Broadcast Storm Protection, Port Lock
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP, PROFINET IO
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 256
VLAN ID Range: VID 1 to 4094
IGMP Groups: 2048
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit
Jumbo Frame Size: 9.6 KB

Interface

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed
Fiber Ports: 100/1000BaseSFP slot
Console Port: USB-serial console (Type B connector)
Storage Port: USB storage (Type A connector for ABC-02-USB)
DIP Switches: Turbo Ring, Master, Coupler, Reserve
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 1 input with the same ground, but electrically isolated from the electronics.
- +13 to +30 V for state "1"
- -30 to +3 V for state "0"
- Max. input current: 8 mA

Button: Reset button

Power Requirements

Input Voltage: 12/24/48/-48 VDC, redundant dual inputs
Input Current:
EDS-G516E: 0.39 A @ 24 VDC
EDS-G512E: 0.34 A @ 24 VDC
EDS-G508E: 0.28 A @ 24 VDC
Overload Current Protection: Present
Connection: 2 removable 2-contact terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 79.2 x 135 x 137 mm (3.1 x 5.3 x 5.4 in)
Weight: 1440 g (3.18 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508
Hazardous Location: UL/cUL Class 1 Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nA nC IIC T4 Gc
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Electrical Substations: IEC 61850-3, IEEE 1613
Traffic Control: NEMA TS2
Rail Traffic: EN 50121-4
Marine: DNV, GL, LR, ABS, NK
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

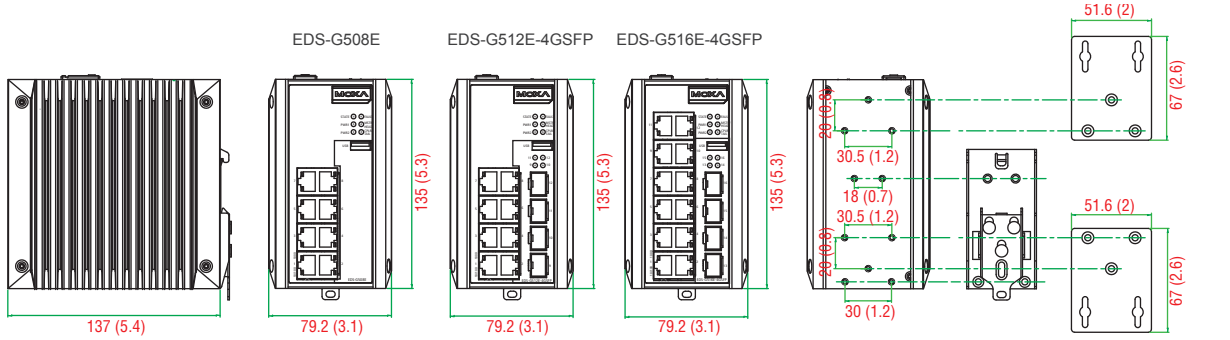
Time: EDS-G508E Series: 808,970 hrs
EDS-G512E-4GSFP Series: 816,823 hrs
EDS-G516E-4GSFP Series: 805,491 hrs
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | DIN-Rail/Panel-Mounting Kit

Ordering Information

Available Models		Gigabit Ethernet Port Interface	
Standard Temperature (-10 to 60°C)	Wide Temperature (-40 to 75°C)	10/100/1000BaseT(X)	100/1000BaseSFP*
EDS-G508E	EDS-G508E-T	8	–
EDS-G512E-4GSFP	EDS-G512E-4GSFP-T	8	4
EDS-G516E-4GSFP	EDS-G516E-4GSFP-T	12	4

*The EDS-G500E series supports up to 4 100/1000BaseSFP slots. See the SFP-1G, SFP-1G Copper, and SFP-1FE datasheets for Gigabit/Fast Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-02-USB: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
DR-4524/75-24/120-24: 45/75/120 W DIN-rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-51-01: Wall-mounting kit, 2 plates with 6 screws
RK-4U: 4U-high 19-inch rack-mounting kit

Package Checklist

- EDS-G500E switch
- USB Cable: CBL-USBA/B-100
- Protective caps for unused ports
- Documentation and software CD
- Warranty card
- Hardware installation guide (printed)

EDS-G509 Series

9G-port full Gigabit managed Ethernet switches

- 4 10/100/1000BaseT(X) ports plus 5 combo (10/100/1000BaseT(X) or 100/1000BaseSFP slot) Gigabit ports
- Fiber optic options for extending distance and improving electrical noise immunity
- Turbo Ring and Turbo Chain (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Easy network management by web browser, CLI, Telnet/serial console, Windows utility, and ABC-01
- Supports MXstudio for easy, visualized industrial network management

Introduction

The EDS-G509 is equipped with 9 Gigabit Ethernet ports and up to 5 fiber optic ports, making it ideal for upgrading an existing network to Gigabit speed or building a new full Gigabit backbone. Gigabit transmission increases bandwidth for higher performance and transfers large amounts of video, voice, and data across a network quickly. Redundant Ethernet Turbo Ring, Turbo Chain, RSTP/STP, and MSTP increase system reliability and the availability of your network backbone. The EDS-G509 series is designed especially for communication demanding applications, such as video and process monitoring, shipbuilding, ITS, and DCS systems, all of which can benefit from a scalable backbone construction.

Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Software-based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP and Modbus/TCP protocols for device management and monitoring
- Compatible with PROFINET protocol for transparent data transmission
- Turbo Ring and Turbo Chain (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output
- ABC-01 (Automatic Backup Configurator) for system configuration backup

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Broadcast Storm Protection, Port Lock
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit

Interface

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed
Fiber Ports: 100/1000BaseSFP slot
Console Port: RS-232 (RJ45 connector)
DIP Switches: Turbo Ring, Master, Coupler, Reserve
Alarm Contact: 2 relay outputs with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 inputs with the same ground, but electrically isolated from the electronics.
• +13 to +30 V for state "1"
• -30 to +3 V for state "0"
• Max. input current: 8 mA

Power Requirements

Input Voltage: 12/24/48 VDC, redundant dual inputs
Operating Voltage: 9.6 to 69 VDC
Input Current: 0.69 A @ 24 VDC
Overload Current Protection: Present
Connection: 2 removable 6-contact terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 87.1 × 135 × 107 mm (3.43 × 5.31 × 4.21 in)
Weight: 1510 g (3.33 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Rail Traffic: EN 50121-4
Marine: DNV, GL, LR, ABS, NK
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

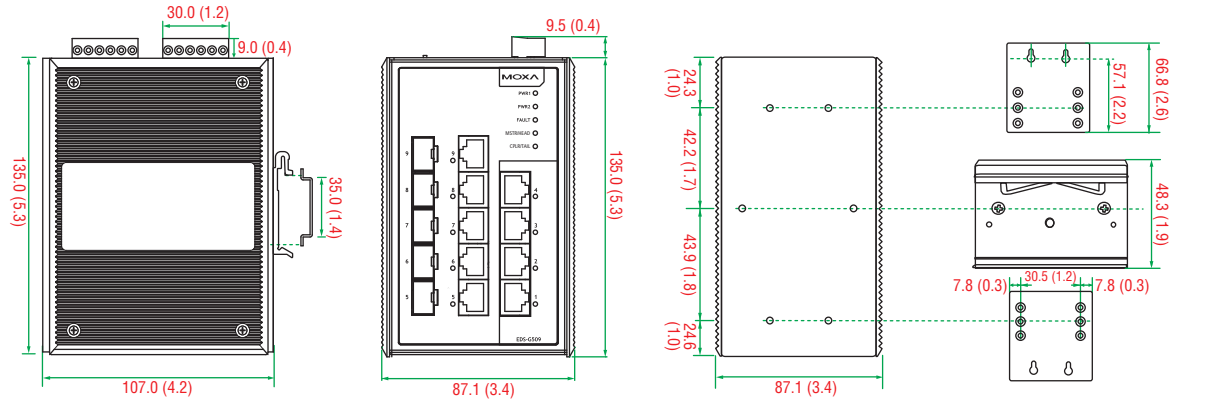
Time: 598,659 hrs
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | DIN-Rail/Panel-Mounting Kit

Ordering Information

Available Models

EDS-G509: Industrial full Gigabit managed Ethernet switch with 4 10/100/1000BaseT(X) ports, and 5 10/100/1000BaseT(X) or 100/1000BaseSFP slot combo ports, 0 to 60°C operating temperature
EDS-G509-T: Industrial full Gigabit managed Ethernet switch with 4 10/100/1000BaseT(X) ports, and 5 10/100/1000BaseT(X) or 100/1000BaseSFP slot combo ports, -40 to 75°C operating temperature
Note: The EDS-G509 series switches support 5 100/1000BaseSFP slots. See the SFP-1G and SFP-1FE datasheets for Gigabit/Fast Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
DR-4524/75-24/120-24: 45/75/120 W DIN-rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-rail 24 VDC power supplies, -20 to 70°C operating temperature
RK-4U: 4U-high 19-inch rack-mounting kit
WK-46: Wall-mounting kit, 2 plates with 8 screws

Package Checklist

- EDS-G509 switch
- Serial Cable: CN20070
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

EDS-518E Series

14+4G-port Gigabit managed Ethernet switches

- 4 Gigabit plus 14 Fast Ethernet ports for copper and fiber
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- TACACS+, SNMPv3, IEEE 802.1x, HTTPS, and SSH to enhance network security
- EtherNet/IP, PROFITNET, and Modbus/TCP protocols supported for device management and monitoring
- Fiber Check™--comprehensive fiber status monitoring and warning on MST/MSC/SSC/SFP fiber ports
- Supports MXstudio for easy, visualized industrial network management
- V-ON™ ensures millisecond-level multicast data and video network recovery

EN 50121

Introduction

The EDS-518E series is a standalone, compact-size 18-port managed Ethernet switch that provides 4 combo Gigabit ports with built-in RJ45 or SFP slots for Gigabit fiber optic communication. The14 fast Ethernet ports with a variety of copper and fiber port combinations gives the EDS-518E series greater flexibility for designing your network and application. The Ethernet redundant Turbo Ring, Turbo Chain , RSTP/STP, and MSTP increase the system reliability and availability of your network backbone. The EDS-518E also supports advanced management and security features.

In addition, the EDS-518E series is designed especially for harsh industrial environments with limited installation space and high protection level requirements, such as maritime, rail wayside, oil and gas, factory automation and process automation.

Features and Benefits

- Software-based IEEE 1588v2 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP, PROFINET, and Modbus/TCP protocols for device management and monitoring
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Fiber Check™ provides s comprehensive fiber Digital Diagnostic Monitoring (DDM) function and event warning on MST/MSC/SSC/SFP fiber ports
- Bandwidth management prevents unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output
- ABC-02-USB (Automatic Backup Configurator) for system configuration backup/restore and firmware upgrade.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1x for Authentication
IEEE 802.3ad for Port Trunk with LACP

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, Fiber Check, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2/v3, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Broadcast Storm Protection, Port Lock
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP, PROFINET IO
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
MAC Table Size: 16 K
Packet Buffer Size: 1 Mbit

Interface

RJ45 Ports: 10/100BaseT(X) or 10/100/1000BaseT(X) auto negotiation speed
Fiber Ports: 100BaseFX (SC/ST connector) and 100/1000BaseSFP slot
Console Port: USB-serial console (Type B connector)
Storage Port: USB storage port (Type A connector)
LED Indicators: PWR1, PWR2, STATE, FAULT, 10/100M (TP port), 100M (fiber port), 100/1000M (Gigabit port), MSTR/HEAD, CPLR/TAIL
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC

Digital Inputs: 1 input with the same ground, but electrically isolated from the electronics.
- +13 to +30 V for state "1"
- -30 to +3 V for state "0"
- Max. input current: 8 mA

Button: Reset button

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Power Requirements

Input Voltage: 12/24/48/-48 VDC, redundant dual inputs
Input Current:
EDS-518E-4GTXSFP: 0.75 A @ 24 V
EDS-518E-MM-ST/SC-4GTXSFP: 0.61 A @ 24 V
EDS-518E-SS-SC-4GTXSFP: 0.61 A @ 24 V
Overload Current Protection: Present
Connection: 2 removable 4-contact terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 94 x 135 x 137 mm (3.7 x 5.31 x 5.39 in)
Weight: 1,518 g (3.35 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508
Hazardous Location: UL/cUL Class 1 Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nA nC IIC
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Electrical Substations: IEC 61850-3, IEEE 1613
Traffic Control: NEMA TS2
Rail Traffic: EN 50121-4
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

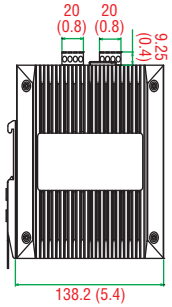
Time: 723,953 hrs
Standard: Telcordia (Bellcore), GB

Warranty

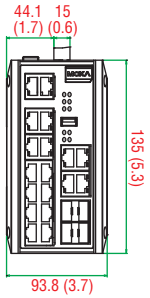
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

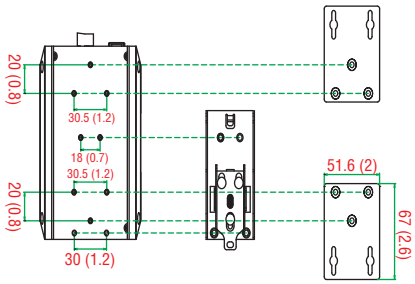
Unit: mm (inch)



Side View



Front View



Rear View

DIN-Rail/Panel-Mounting Kit

Ordering Information

Available Models		Total No. of Ports	Port Interface				
			Gigabit Combo Port	Fast Ethernet			
					100BaseFX		
Standard Temperature (-10 to 60°C)	Wide Temperature (-40 to 75°C)		10/100/1000BaseT(X) or 100/1000BaseSFP*	10/100BaseT(X)	Multi-Mode, SC Connector	Multi-Mode, ST Connector	Single-Mode, SC Connector
EDS-518E-4GTXSFP	EDS-518E-4GTXSFP-T	18	4	14	–	–	–
EDS-518E-MM-SC-4GTXSFP	EDS-518E-MM-SC-4GTXSFP-T	18	4	12	2	–	–
EDS-518E-MM-ST-4GTXSFP	EDS-518E-MM-ST-4GTXSFP-T	18	4	12	–	2	–
EDS-518E-SS-SC-4GTXSFP	EDS-518E-SS-SC-4GTXSFP-T	18	4	12	–	–	2

*The EDS-518E series supports 4 1000BaseSFP slots. See the SFP section for Gigabit Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-02-USB-T: Configuration backup and restoration tool for managed Ethernet switches, -40 to 75°C operating temperature
DR-4524/75-24/120-24: 45/75/120 W DIN-rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-51-01: Wall-mounting kit, 2 plates with 6 screws
RK-4U: 4U-high 19-inch rack-mounting kit

Package Checklist

- EDS-518E switch
- USB-IF certified cable
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

EDS-510E Series

7+3G-port Gigabit managed Ethernet switches

- 3 Gigabit Ethernet ports for redundant ring or uplink solutions
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- RADIUS, TACACS+, SNMPv3, IEEE 802.1x, HTTPS, and SSH to enhance network security
- EtherNet/IP, PROFINET, and Modbus/TCP protocols supported for device management and monitoring
- Supports MXstudio for easy, visualized industrial network management
- V-ON™ ensures millisecond-level multicast data and video network recovery

Introduction

The EDS-510E Gigabit managed Ethernet switch is designed to meet rigorous mission critical applications, such as factory automation, ITS and process control. The 3 Gigabit Ethernet ports allows great flexibility to build up a Gigabit redundant Turbo Ring and a Gigabit uplink. The switch adopts USB interfaces for switch configuration, system file backup, and firmware upgrade, making it easier to manage.

Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions
- Software-based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP, PROFINET, and Modbus/TCP protocols for device management and monitoring
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- RADIUS, TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Automatic warning by exception through e-mail, relay output
- Configurable by web browser, Telnet/USB console, CLI, MXconfig, and ABC-02 automatic backup configurator

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2/v3, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Broadcast Storm Protection, Port Lock
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP, PROFINET IO
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 2048
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit

Interface

RJ45 Ports: 10/100BaseT(X) or 10/100/1000BaseT(X) auto negotiation speed
Fiber Ports: 100/1000BaseSFP slot
Console Port: USB-serial console (Type B connector)
Storage Port: USB storage (Type A connector for ABC-02-USB)
DIP Switches: Turbo Ring, Master, Coupler, Reserve

Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 1 input with the same ground, but electrically isolated from the electronics.
- +13 to +30 V for state "1"
- -30 to +3 V for state "0"
- Max. input current: 8 mA

Button: Reset button

Power Requirements

Input Voltage: 12/24/48/-48 VDC, redundant dual inputs
Operating Voltage: 9.6 to 60 VDC
Input Current: 0.58 A @ 24 V
Overload Current Protection: Present
Connection: 2 removable 4-contact terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 79.2 x 135 x 116 mm (3.12 x 5.31 x 4.57 in)
Weight: 1690 g (3.73 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nA nC IIC T4 Gc
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Electrical Substations: IEC 61850-3, IEEE 1613
Traffic Control: NEMA TS2
Rail Traffic: EN 50121-4
Marine: DNV, GL, LR, ABS, NK
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

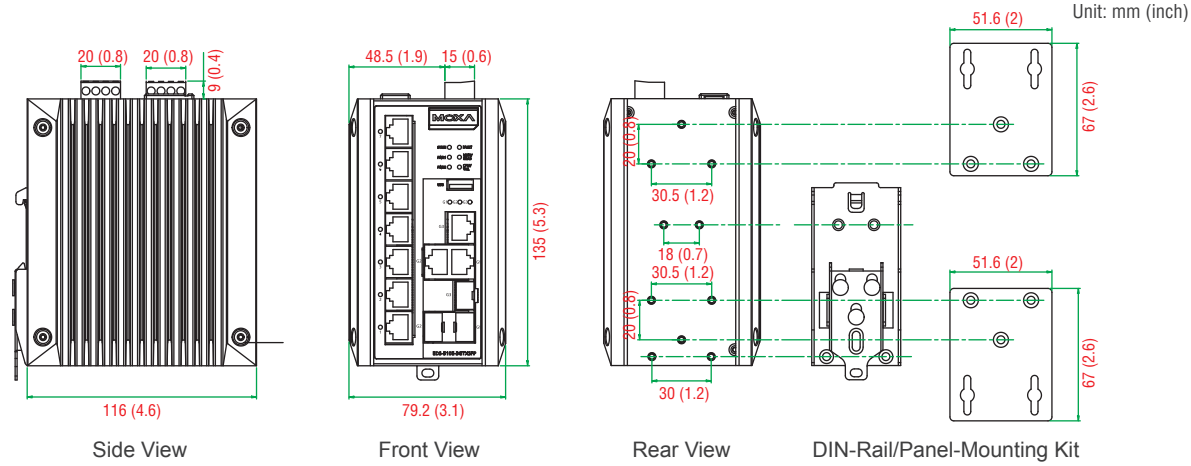
Time: 723,532 hours
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | DIN-Rail/Panel-Mounting Kit

Ordering Information

Available Models		Port Interface	
		Gigabit Ethernet	Fast Ethernet
Standard Temperature (-10 to 60°C)	Wide Temperature (-40 to 75°C)	10/100/1000BaseT(X) or 100/1000BaseSFP*	10/100BaseT(X)
EDS-510E-3GTXSFP	EDS-510E-3GTXSFP-T	3	7

*The EDS-510E series supports up to 3 100/1000BaseSFP slots. See the SFP-1G and SFP-1FE datasheets for Gigabit / Fast Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-02-USB: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
DR-4524/75-24/120-24: 45/75/120 W DIN-rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-51-01: Wall-mounting kit, 2 plates with 6 screws
RK-4U: 4U-high 19-inch rack-mounting kit

Package Checklist

- EDS-510E switch
- USB Cable: CBL-USBA/B-100
- Protective caps for unused ports
- Documentation and software CD
- Warranty card
- Hardware installation guide (printed)

EDS-505A/508A/516A Series

5, 8, and 16-port managed Ethernet switches

- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Easy network management by web browser, CLI, Telnet/serial console, Windows utility, and ABC-01
- Supports MXstudio for easy, visualized industrial network management

Introduction

The EDS-505A/508A/516A are standalone 5, 8, and 16-port managed Ethernet switches. With their advanced Turbo Ring and Turbo Chain technology (recovery time < 20 ms), RSTP/STP, and MSTP support the EDS-505A/508A/516A switches increase the reliability and availability of your industrial Ethernet network. Models with an wide operating temperature range of -40 to 75°C are also available, and the switches support advanced management and security features, making the EDS-505A/508A/516A switches suitable for any harsh industrial environment.

Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Software-based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP and Modbus/TCP protocols for device management and monitoring
- Compatible with PROFINET protocol for transparent data transmission
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- RMON for efficient network monitoring and proactive capability
- SNMPv1/v2c/v3 for different levels of network management
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Bandwidth management to prevent unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Automatic warning by exception through e-mail, relay output

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Port Lock, Broadcast Storm Protection (EDS-516A only)
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit (EDS-505A/508A), 2 Mbit (EDS-516A)

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100BaseFX ports (SC/ST connector)
Console Port: RS-232 (RJ45 connector)

DIP Switches: Turbo Ring, Master, Coupler, Reserve (EDS-505A/508A series only)
Alarm Contact: 2 relay outputs with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 inputs with the same ground, but electrically isolated from the electronics.
- +13 to +30 V for state "1"
- -30 to +3 V for state "0"
- Max. input current: 8 mA

Optical Fiber

		100BaseFX			
		Multi-Mode		Single-Mode (40 km)	Single-Mode (80 km)
Fiber Cable Type		OM1	50/125 µm 800 MHz*Km	G.652	G.652
Typical Distance		4 km	5 km	40 km	80 km
Wave-length	Typical (nm)	1300		1310	1550
	TX Range (nm)	1260 to 1360		1280 to 1340	1530 to 1570
	RX Range (nm)	1100 to 1600		1100 to 1600	1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5	0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34	-3 to -34
	Link Budget (dB)	12		29	29
	Dispersion Penalty (dB)	3		1	1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Power Requirements

Input Voltage: 24 VDC, redundant dual inputs
Operating Voltage: 12 to 45 VDC
Input Current: EDS-505A: 0.21 A @ 24 V
EDS-505A-MM/SS: 0.3 A @ 24 V
EDS-508A: 0.22A @ 24 V
EDS-508A-MM/SS: 0.31 A @ 24 V
EDS-516A: 0.35 A @ 24 V
EDS-516A-MM: 0.44 A @ 24 V
Overload Current Protection: Present
Connection: 2 removable 6-contact terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions:
EDS-505A/508A Series: 80.2 x 135 x 105 mm
(3.16 x 5.31 x 4.13 in)
EDS-516A Series: 94 x 135 x 142.7 mm (3.7 x 5.31 x 5.62 in)
Weight:
EDS-505A/508A Series: 1040 g (2.30 lb)
EDS-516A Series: 1586 g (3.50 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508, UL 60950-1, CSA C22.2 No. 60950-1, EN 60950-1
Hazardous Location: UL/cUL Class 1 Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nA nC IIC T4 Gc
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS: IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Marine: DNV, GL
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time:
EDS-505A Series: 352,000 hrs
EDS-508A Series: 339,000 hrs
EDS-516A Series: 247,000 hrs
Standard: Telcordia (Bellcore), GB

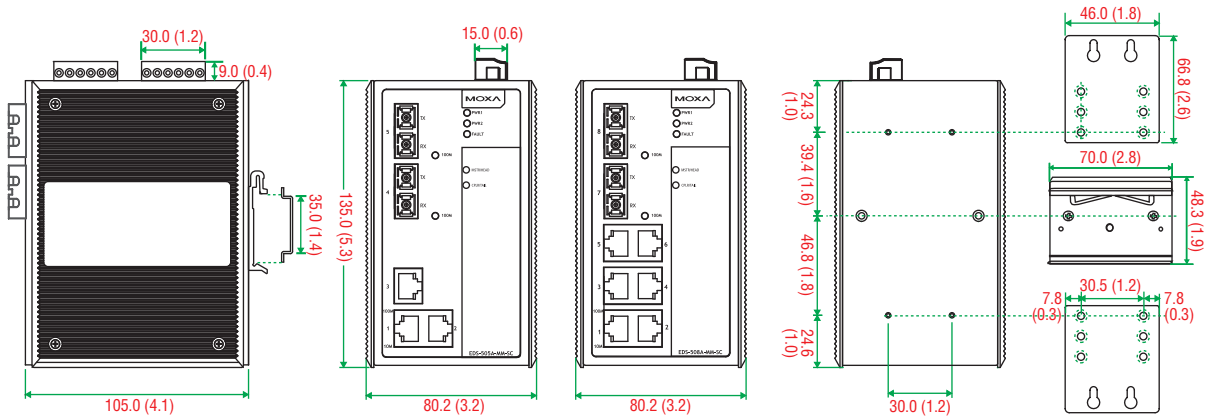
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

EDS-505A/508A Series

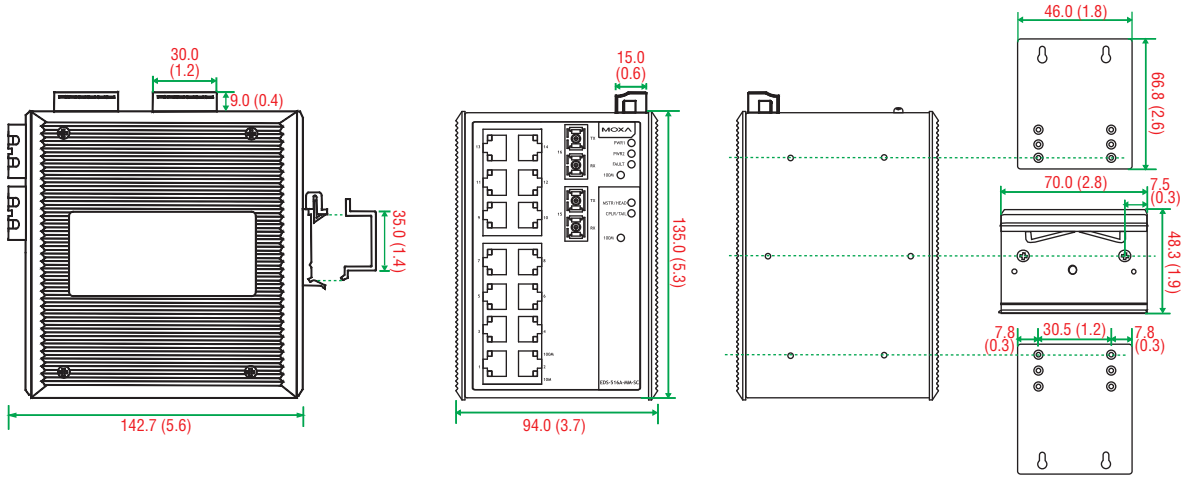


Side View | Front View | Rear View | DIN-Rail/Panel Mounting Kit

Dimensions

Unit: mm (inch)

EDS-516A Series



Side View | Front View | Rear View | DIN-Rail/Panel-Mounting Kit

Ordering Information

Available Models		Port Interface				
Standard Temperature (0 to 60˚C)	Wide Temperature (-40 to 75˚C)	10/100BaseT(X)	100BaseFX			
			Multi-Mode, SC Connector	Multi-Mode, ST Connector	Single-Mode, SC Connector	Single-Mode, SC Connector, 80 km
EDS-505A/508A Series						
EDS-505A/508A	EDS-505A/508A-T	5/8	–	–	–	–
EDS-505A/508A-MM-SC	EDS-505A/508A-MM-SC-T	3/6	2	–	–	–
EDS-505A/508A-MM-ST	EDS-505A/508A-MM-ST-T	3/6	–	2	–	–
EDS-505A/508A-SS-SC	EDS-505A/508A-SS-SC-T	3/6	–	–	2	–
EDS-508A-SS-SC-80	–	6	–	–	–	2
EDS-516A Series						
EDS-516A	EDS-516A-T	16	–	–	–	–
EDS-516A-MM-SC	EDS-516A-MM-SC-T	14	2	–	–	–
EDS-516A-MM-ST	EDS-516A-MM-ST-T	14	–	2	–	–

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
DR-4524/75-24/120-24: 45/75/120 W DIN-rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-rail 24 VDC power supplies, -20 to 70°C operating temperature
RK-4U: 4U-high 19-inch rack-mounting kit
WK-46: Wall-mounting kit, 2 plates with 8 screws

Package Checklist

- EDS-505A or EDS-508A or EDS-516A switch
- Serial Cable: CN20070
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

EDS-405A/408A Series

5 and 8-port entry-level managed Ethernet switches

- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), and RSTP/STP for network redundancy
- IGMP Snooping, QoS, IEEE 802.1Q VLAN, and port-based VLAN supported
- Easy network management by web browser, CLI, Telnet/serial console, Windows utility, and ABC-01
- PROFINET or EtherNet/IP enabled by default (PN or EIP models)
- Supports MXstudio for easy, visualized industrial network management

Introduction

The EDS-405A/408A are entry-level 5 and 8-port managed Ethernet switches designed especially for industrial applications. The switches support a variety of useful management functions, such as Turbo Ring, Turbo Chain, ring coupling, IGMP snooping, IEEE 802.1Q VLAN, port-based VLAN, QoS, RMON, bandwidth management, port mirroring, and warning by email or relay. The ready-to-use Turbo Ring can be set up easily using the web-based management interface, or with the DIP switches located on the top panel of the EDS-405A/408A switches.

Features and Benefits

- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP, Modbus/TCP and PROFINET* protocols for device management and monitoring
- EtherNet/IP EDS (Electronic Data Sheet) file, custom AOI (Add-On Instructions) and FactoryTalk® View faceplate available
- PROFINET GSDML file and SIMATIC STEP 7 device icons available*
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p and TOS/DiffServ) to increase determinism
- RMON for efficient network monitoring and proactive capability
- SNMPv1/v2c/v3 for different levels of network management security
- Bandwidth management to prevent unpredictable network status
- Port mirroring for online debugging

* EDS-405A/408A-PN series only

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1p for Class of Service
IEEE 802.1Q for VLAN Tagging

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2, GMRP
Redundancy Protocols: STP, RSTP, Turbo Ring v1/v2, Turbo Chain
Time Management: SNTP, NTP Server/Client
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

MAC Table Size: 2 K (EDS-405A), 8 K (EDS-408A)
Packet Buffer Size: 1 Mbit

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100BaseFX ports (SC/ST connector)
Console Port: RS-232 (RJ45 connector)
DIP Switches: Turbo Ring, Master, Coupler, Reserve
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Power Requirements

Input Voltage: 24 VDC, redundant dual inputs
Operating Voltage: 12 to 45 VDC
Input Current: EDS-405A, EDS-405A-EIP, EDS-405A-PN: 0.21 A @ 24 V
EDS-405A-MM/SS: 0.28 A @ 24 V
EDS-408A, EDS-408A-EIP, EDS-408A-PN: 0.22 A @ 24 V
EDS-408A-MM/SS: 0.3 A @ 24 V
EDS-408A-3M/3S/2M1S/1M2S: 0.28 A @ 24 V
Overload Current Protection: Present
Connection: 1 removable 6-contact terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)
Weight:
EDS-405A, EDS-405A-MM, EDS-405A-SS, EDS-405A-PN, EDS-405A-EIP: 650 g (1.44 lb)
EDS-408A, EDS-408A-MM, EDS-408A-SS, EDS-408A-PN, EDS-408A-EIP: 650 g (1.44 lb)
EDS-408A-3M/3S/2M1S/1M2S: 890 g (1.97 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508, UL 60950-1*, CSA C22.2 No. 60950-1, EN 60950-1**
Hazardous Location: UL/cUL Class 1 Division 2 Groups A/B/C/D*, ATEX Zone 2 Ex nA nC IIC T4 Gc***,
ATEX Zone 2 Ex nA nC op is IIC T4 Gc****
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Traffic Control: NEMA TS2
Rail Traffic: EN 50121-4**
Marine:
EDS-405A/408A, EDS-405A/408A 2 Fiber series: DNV, GL
EDS-408A 3 Fiber series: DNV, GL, LR, ABS, NK
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

*EDS-405A/408A, EDS-405A/408A 2 Fiber series only
**EDS-408A only
***EDS-405A, EDS-405A 2 Fiber series only
****EDS-408A, EDS-408A 2 Fiber series only
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

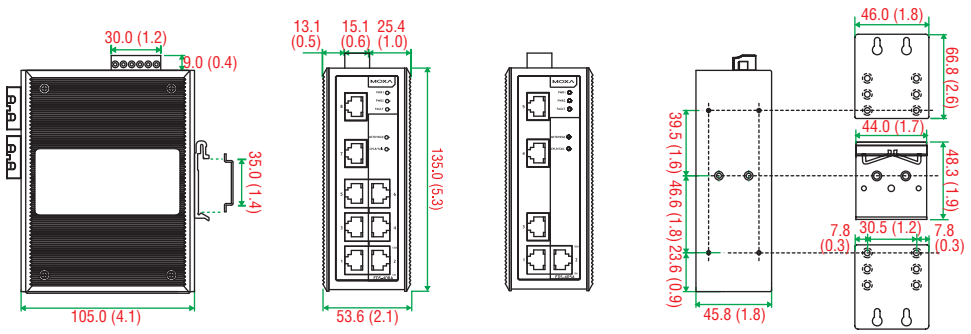
Time:
EDS-405A Series: 852,421 hrs
EDS-408A Series: 1,102,845 hrs
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | DIN-Rail/Panel-Mounting Kit

Ordering Information

Available Models		Port Interface			
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	100BaseFX		
			Multi-Mode, SC Connector	Multi-Mode, ST Connector	Single-Mode, SC Connector
EDS-405A/408A	EDS-405A/408A-T	5/8	–	–	–
EDS-405A/408A-MM-SC	EDS-405A/408A-MM-SC-T	3/6	2	–	–
EDS-405A/408A-MM-ST	EDS-405A/408A-MM-ST-T	3/6	–	2	–
EDS-405A/408A-SS-SC	EDS-405A/408A-SS-SC-T	3/6	–	–	2
EDS-408A-3M-SC	EDS-408A-3M-SC-T	5	3	–	–
EDS-408A-3M-ST	EDS-408A-3M-ST-T	5	–	3	–
EDS-408A-3S-SC	EDS-408A-3S-SC-T	5	–	–	3
EDS-408A-2M1S-SC	EDS-408A-2M1S-SC-T	5	2	–	1
EDS-408A-1M2S-SC	EDS-408A-1M2S-SC-T	5	1	–	2
EDS-405A/408A-EIP	EDS-405A/408A-EIP-T	5/8	–	–	–
EDS-405A/408A-PN	EDS-405A/408A-PN-T	5/8	–	–	–

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
DR-4524/75-24/120-24: 45/75/120 W DIN-rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-rail 24 VDC power supplies, -20 to 70°C operating temperature
RK-4U: 4U-high 19-inch rack-mounting kit
WK-46: Wall-mounting kit, 2 plates with 8 screws

Package Checklist

- EDS-405A or EDS-408A switch
- Serial Cable: CN20070
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

EDS-405A-PTP Series

5-port IEEE 1588v2 PTP managed Ethernet switches

- IEEE 1588v2 PTP with hardware time stamping for precise time synchronization of networks
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), and RSTP/STP for network redundancy
- IGMP Snooping, QoS, IEEE 802.1Q VLAN, and port-based VLAN supported
- Easy network management by web browser, CLI, Telnet/serial console, Windows utility, and ABC-01
- Supports MXstudio for easy, visualized industrial network management

Introduction

The EDS-405A-PTP are 5-port IEEE 1588v2 PTP switches designed especially for real-time control applications. The switches support Modbus TCP, PROFINET RT, and EtherNet/IP for better SCADA integration. Other management functions such as IGMP snooping, IEEE 802.1Q VLAN, QoS, RMON and relay warning, make the network planning more flexible and easy.

IEEE 1588 PTP Features

- IEEE 1588v2 PTP (Precision Time Protocol) with hardware time stamping for precise time synchronization of networks
- Support both IEEE 1588 Boundary Clock and Transparent Clock
- Support both End to End (2-step) and Peer to Peer (2-step) modes in Transparent Clock
- High precision time accuracy (under 1 μs)

General Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP, Modbus/TCP and PROFINET protocols for device management and monitoring
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), and RSTP/STP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p and TOS/DiffServ) to increase determinism
- RMON for efficient network monitoring and proactive capability
- SNMPv1/v2c/v3 for different levels of network management security
- Bandwidth management to prevent unpredictable network status
- Port mirroring for online debugging

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.1Q for VLAN Tagging

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, DDM, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2, GMRP
Redundancy Protocols: STP, RSTP, Turbo Ring v1/v2, Turbo Chain
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (hardware-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Console Port: RS-232 (RJ45 connector)
DIP Switches: Turbo Ring, Master, Coupler, Reserve
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC

Power Requirements

Input Voltage: 12/24/48 VDC, redundant dual inputs
Operating Voltage: 9.6 to 60 VDC
Input Current: 0.23 A @ 24 V

Overload Current Protection: Present
Connection: 1 removable 6-contact terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)
Weight: 820 g (1.81 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 0.5 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 0.5 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 3 V
IEC 61000-4-8
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

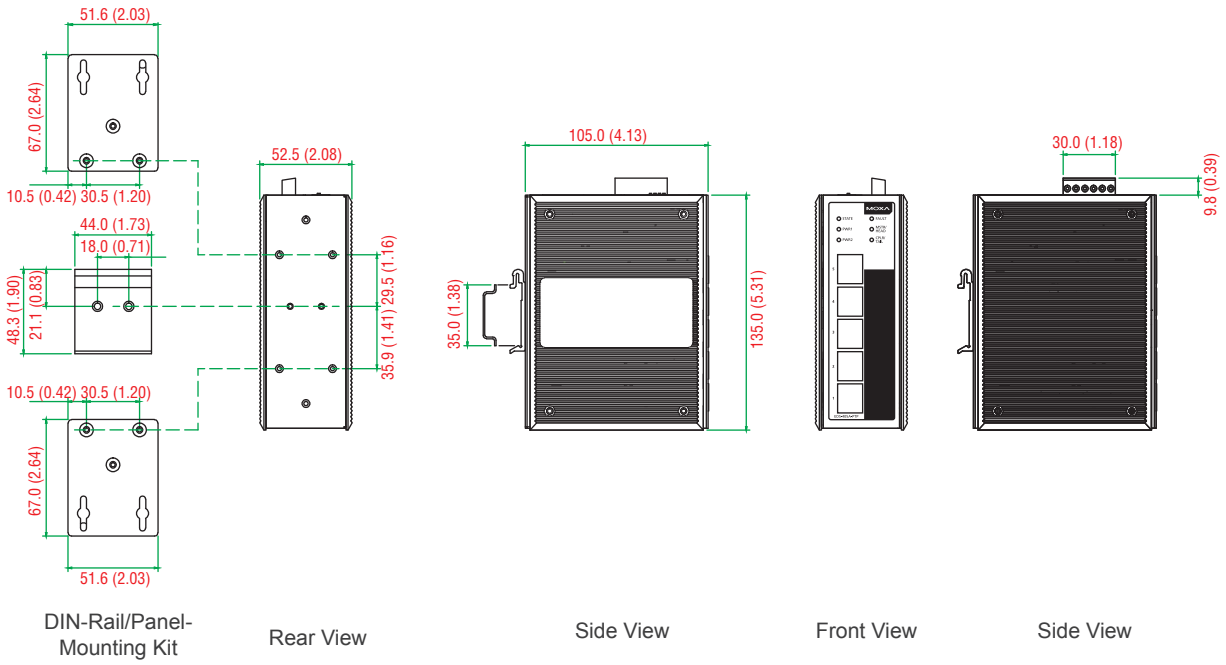
Time: 1,354,590 hours
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



DIN-Rail/Panel-Mounting Kit | Rear View | Side View | Front View | Side View

Ordering Information

Available Models		Port Interface			
Standard Temperature (-10 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	100BaseFX		
			Multi-Mode, SC Connector	Multi-Mode, ST Connector	Single-Mode, SC Connector
EDS-405A-PTP	EDS-405A-PTP-T	5	–	–	–

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
DR-4524/75-24/120-24: 45/75/120 W DIN-rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-rail 24 VDC power supplies, -20 to 70°C operating temperature
RK-4U: 4U-high 19-inch rack-mounting kit
WK-46: Wall-mounting kit, 2 plates with 8 screws

Package Checklist

- EDS-405A-PTP switch
- Serial Cable: CN20070
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

EDS-G205-1GTXSFP/G308 Series

5G and 8G-port full Gigabit unmanaged Ethernet switches

- Fiber optic options for extending distance and electrical noise immunity
- Redundant dual 12/24/48 VDC power inputs
- Supports jumbo frame transmission up to 10 KB (EDS-G205-1GTXSFP series) and 9.6 KB (EDS-G308 series)
- Relay output warning for power failure and port break alarm
- Broadcast storm protection
- -40 to 75°C operating temperature range (T models)

Introduction

The EDS-G205-1GTXSFP and EDS-G308 switches are equipped with 5 and 8 Gigabit Ethernet ports, respectively, and up to 2 fiber optic ports (one for EDS-G205-1GTXSFP series and two for EDS-G308-2 SFP series), making them ideal for applications that demand high bandwidth. The EDS-G205-1GTXSFP/G308 switches provide an economical solution for your industrial Gigabit Ethernet connections, and the built-in relay warning function alerts network managers when power failures or port breaks occur. In addition, the add-on 4-pin DIP switches can be used for controlling over the functions of broadcast protection, jumbo frame, IEEE 802.3az energy saving and 100/1000 SFP speed switching (EDS-G205-1GTXSFP series only) is ideal for easy on-site configuration for any industrial automation application. Two models are available in this series. One model has an operating temperature range of -10 to 60°C, and the other model has an extended operating temperature range of -40 to 75°C. Both models undergo a 100% burn-in test to ensure that they fulfill the special needs of industrial automation control applications. The EDS-G205-1GTXSFP/G308 switches can be installed easily on a DIN-rail or in distribution boxes.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.3az for Energy-Efficient Ethernet
Processing Type: Store and Forward

Switch Properties

MAC Table Size: 8 K
Packet Buffer Size: 1024 kbit (EDS-G205-1GTXSFP Series), 4 Mbit (EDS-G308 Series)
Jumbo Frame Size: 10 KB (EDS-G205-1GTXSFP Series), 9.6 KB (EDS-G308 Series)

Interface

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100/1000BaseSFP slot (SFP model)
DIP Switches: One for port break alarm, one for Enable/Disable broadcast storm protection, jumbo frame, IEEE 802.3az energy saving and 100/1000 SFP speed switching (EDS-G205-1GTXSFP series only)
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC

Power Requirements

Input Voltage: 12/24/48 VDC, redundant dual inputs
Operating Voltage: 9.6 to 60 VDC
Input Current: EDS-G205-1GTXSFP: 0.14 A @ 24 V
EDS-G308: 0.29 A @ 24 V
EDS-G308-2SFP: 0.31 A @ 24 V
Connection: 1 removable 6-contact terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions:
EDS-G205-1GTXSFP Series: 29 x 135 x 105 mm (1.14 x 5.31 x 4.13 in)
EDS-G308 Series: 53 x 135 x 105 mm (2.08 x 5.31 x 4.13 in)
Weight:
EDS-G205-1GTXSFP Series: 290 g (0.64 lb)
EDS-G308 Series: 880 g (1.94 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508, EN 60950-1 (LVD)
Hazardous Location:
UL/cUL Class 1 Division 2 Groups A/B/C/D,
ATEX Zone 2 Ex nA nC IIC T4 Gc (EDS-G205-1GTXSFP series)
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Rail Traffic: EN 50121-4 (EDS-G205-1GTXSFP series)
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time:
EDS-G205-1GTXSFP Series: 2,823,446 hrs
EDS-G308 Series: 2,424,649 hrs
Standard: Telcordia (Bellcore), GB

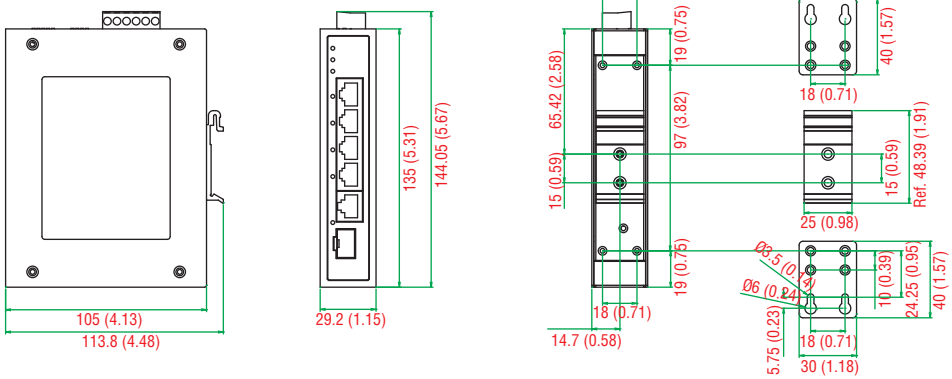
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

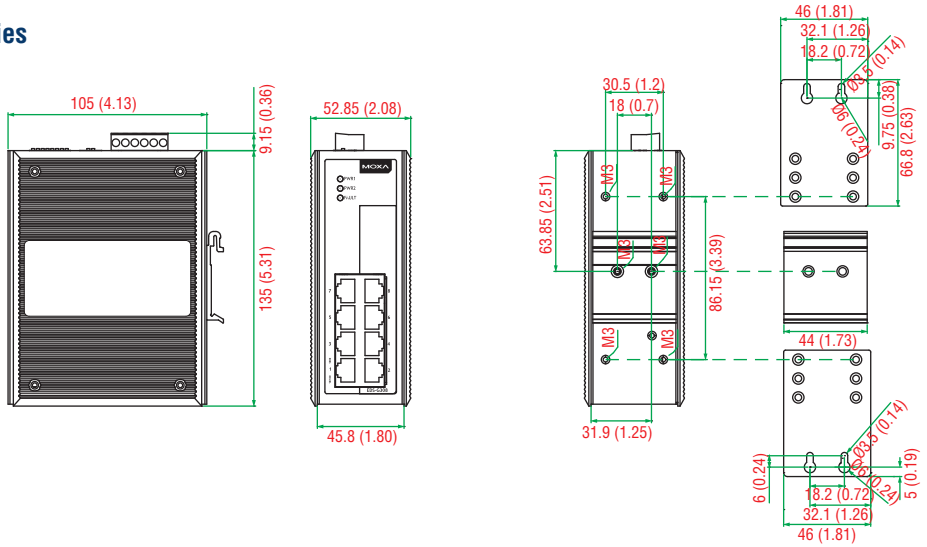
Unit: mm (inch)

EDS-G205-1GTXSFP Series



Side View | Front View | Rear View | DIN-Rail/ Panel-Mounting Kit

EDS-G308 Series



Side View | Front View | Rear View | DIN-Rail/ Panel-Mounting Kit

Ordering Information

Product Model		Port Interface	
		Gigabit Ethernet	
Standard Temperature	Wide Temperature (-40 to 75°C)	10/100/1000BaseT(X)	Combo Port, 10/100/1000BaseT(X) or 100/1000BaseSFP*
EDS-G205-1GTXSFP	EDS-G205-1GTXSFP-T	4	1
EDS-G308	EDS-G308-T	8	–
EDS-G308-2SFP	EDS-G308-2SFP-T	6	2

* The EDS-G205-1GTXSFP and EDS-G205-1GTXSFP-T support 1 100/1000BaseSFP slot. The EDS-G308-2SFP and EDS-G308-2SFP-T support 2 100/1000BaseSFP slots. See the SFP-1G and SFP-1FE datasheets for Gigabit/Fast Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

DR-4524/75-24/120-24: 45/75/120 W DIN-rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-rail 24 VDC power supplies, -20 to 70°C operating temperature
RK-4U: 4U-high 19-inch rack-mounting kit
WK-30: Wall-mounting kit (EDS-G205 series only)
WK-46: Wall-mounting kit, 2 plates with 8 screws (EDS-G308 series only)

Package Checklist

- EDS-G205-1GTXSFP or EDS-G308 switch
- Protective caps for unused ports
- Hardware installation guide (printed)
- Warranty card

EDS-305/308/309/316 Series

5, 8, 9, and 16-port unmanaged Ethernet switches

- Relay output warning for power failure and port break alarm
- Broadcast storm protection
- Transparent transmission of VLAN tagged packets
- -40 to 75°C operating temperature range (T models)

Introduction

The EDS-305/308/309/316 are 5, 8, 9, and 16-port Ethernet switches that provide an economical solution for your industrial Ethernet connections. The built-in relay warning function alerts network engineers when power failures or port breaks occur, and the switches are designed for harsh industrial environments, such as in hazardous locations (Class 1 Div. 2 / ATEX Zone 2). The switches comply with FCC, UL, and CE standards, and come in two model types: standard operating temperature range models (0 to 60°C) and wide operating temperature range models (-40 to 75°C). Both models undergo a 100% burn-in test to ensure that they fulfill the special needs of industrial automation control applications. The EDS-305/308/309/316 switches can be installed easily on a DIN-rail or in a distribution box.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3x for Flow Control
Processing Type: Store and Forward

Switch Properties

MAC Table Size: 1 K (EDS-305/308/309), 4 K (EDS-316)
Packet Buffer Size: n/a (EDS-305), 512 kbit (EDS-308/309), 1.25 Mbit (EDS-316)

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100BaseFX ports (SC/ST connector)
DIP Switches:
• Port break alarm mask
• Enable/disable broadcast storm protection (EDS-316)
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC

Optical Fiber

		100BaseFX			
		Multi-Mode		Single-Mode (40 km)	Single-Mode (80 km)
Fiber Cable Type		OM1	50/125 µm 800 MHz*Km	G.652	G.652
Typical Distance		4 km	5 km	40 km	80 km
Wave-length	Typical (nm)	1300		1310	1550
	TX Range (nm)	1260 to 1360		1280 to 1340	1530 to 1570
	RX Range (nm)	1100 to 1600		1100 to 1600	1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5	0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34	-3 to -34
	Link Budget (dB)	12		29	29
	Dispersion Penalty (dB)	3		1	1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Power Requirements

Input Voltage:
EDS-305/308: 24 VDC, redundant dual inputs
EDS-309: 24 VDC, redundant dual input
EDS-316: 12/24/48 VDC, redundant dual inputs
Operating Voltage:
EDS-305/308: 12 to 48 VDC
EDS-309: 12 to 45 VDC
EDS-316: 9.6 to 60 VDC

Input Current:
EDS-305: 0.11 A @ 24 V
EDS-305-M/S: 0.15 A @ 24 V
EDS-308: 0.11 A @ 24 V
EDS-308-M/S: 0.18 A @ 24 V
EDS-308-MM/SS: 0.22 A @ 24 V
EDS-309-3M: 0.27 A @ 24 V
EDS-316: 0.23 A @ 24 V
EDS-316-M/S/MM/SS/MS: 0.38 A @ 24 V
Overload Current Protection:
EDS-305, EDS-305-M, EDS-305-S, EDS-308: 1.1 A
EDS-308-M/S/MM/SS, EDS-309 Series, EDS-316 Series: 1.6 A
Connection: 1 removable 6-pin terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions:
EDS-305/308/309 Series:
53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)
EDS-316 Series:
80.1 x 135 x 105 mm (3.15 x 5.31 x 4.13 in)
Weight:
EDS-305/308/309 Series: 790 g (1.75 lb)
EDS-316 Series: 1140 g (2.52 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety:
EDS-305 Series: UL 508, UL 60950-1, CSA C22.2 No. 60950-1
EDS-308/309/316 Series: UL 508, UL 60950-1,
CSA C22.2 No. 60950-1, EN 60950-1
Hazardous Location: UL/cUL Class 1 Division 2 Groups A/B/C/D,
ATEX Zone 2 Ex nA nC IIC T4 Gc
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz, 3 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 3 V (EDS-309/316: 10 V)
IEC 61000-4-8
Marine: DNV, ABS, GL
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time:
EDS-305 Series: 422,000 hrs
EDS-308 Series: 255,000 hrs
EDS-309 Series: 396,000 hrs
EDS-316 Series: 257,000 hrs
Standard: MIL-HDBK-217F, GB 25°C

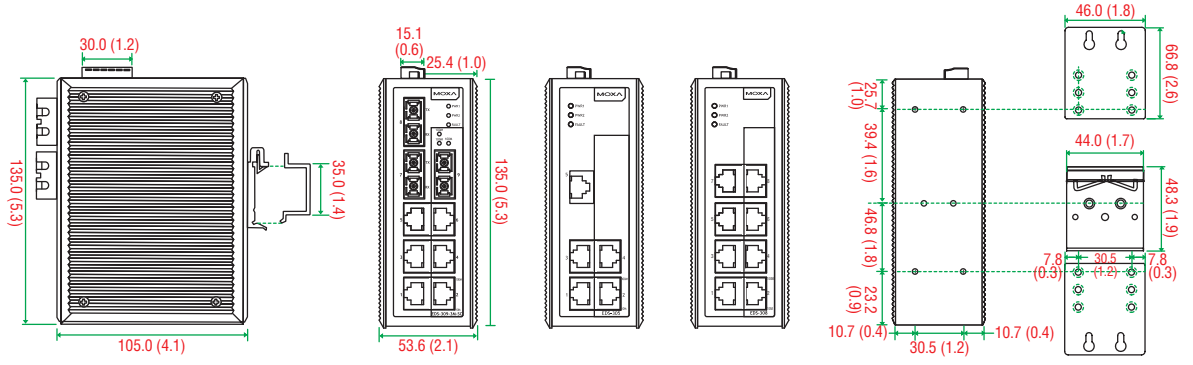
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

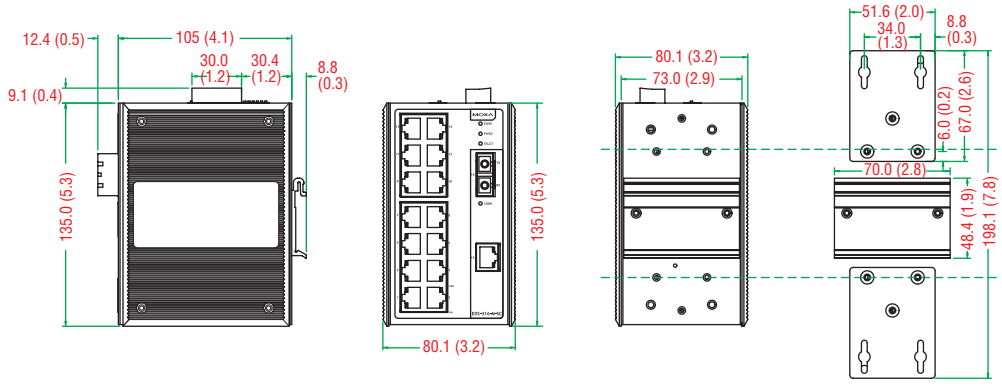
Unit: mm (inch)

EDS-305/308/309 Series



Side View | Front View | Rear View | DIN-Rail/Panel-Mounting Kit

EDS-316 Series



Side View | Front View | Rear View | DIN-Rail/Panel-Mounting Kit

Ordering Information

Available Models		Port Interface				
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	100BaseFX			
			Multi-Mode, SC Connector	Multi-Mode, ST Connector	Single-Mode, SC Connector	Single-Mode, SC Connector, 80 km
EDS-305 Series						
EDS-305	EDS-305-T	5	–	–	–	–
EDS-305-M-SC	EDS-305-M-SC-T	4	1	–	–	–
EDS-305-M-ST	EDS-305-M-ST-T	4	–	1	–	–
EDS-305-S-SC	EDS-305-S-SC-T	4	–	–	1	–
EDS-305-S-SC-80	–	4	–	–	–	1
EDS-308 Series						
EDS-308	EDS-308-T	8	–	–	–	–
EDS-308-M-SC	EDS-308-M-SC-T	7	1	–	–	–
EDS-308-MM-SC	EDS-308-MM-SC-T	6	2	–	–	–
EDS-308-MM-ST	EDS-308-MM-ST-T	6	–	2	–	–
EDS-308-S-SC	EDS-308-S-SC-T	7	–	–	1	–
EDS-308-SS-SC	EDS-308-SS-SC-T	6	–	–	2	–
EDS-308-S-SC-80	–	7	–	–	–	1
EDS-308-SS-SC-80	–	6	–	–	–	2
EDS-309 Series						
EDS-309-3M-SC	EDS-309-3M-SC-T	6	3	–	–	–
EDS-309-3M-ST	EDS-309-3M-ST-T	6	–	3	–	–
EDS-316 Series						
EDS-316	EDS-316-T	16	–	–	–	–
EDS-316-M-SC	EDS-316-M-SC-T	15	1			–
EDS-316-M-ST	EDS-316-M-ST-T	15	–	1	–	–
EDS-316-MM-SC	EDS-316-MM-SC-T	14	2	–	–	–
EDS-316-MM-ST	EDS-316-MM-ST-T	14	–	2	–	–
EDS-316-MS-SC	–	14	1	–	1	–
EDS-316-S-SC	EDS-316-S-SC-T	15	–	–	1	–
EDS-316-SS-SC	EDS-316-SS-SC-T	14	–	–	2	–
EDS-316-SS-SC-80	–	14	–	–	–	2

Optional Accessories (can be purchased separately)

DR-4524/75-24/120-24: 45/75/120 W DIN-rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-rail 24 VDC power supplies, -20 to 70°C operating temperature
RK-4U: 4U-high 19-inch rack-mounting kit
WK-46: Wall-mounting kit, 2 plates with 8 screws

Package Checklist

- EDS-305 or EDS-308 or EDS-309 or EDS-316 switch
- Protective caps for unused ports
- Hardware installation guide (printed)
- Warranty card

EDS-210A Series

8+2G/9+1G-port Gigabit unmanaged Ethernet switches

- Up to 2 Gigabit uplinks for high bandwidth data aggregation
- Multiple fiber ports with up to 4 100BaseSFP port combinations for maximum flexibility
- IP30 metal housing
- Redundant dual power input (12/24/48 VDC)
- -40 to 75°C operating temperature range (T models)

Introduction

The EDS-210A series 10-port industrial Ethernet unmanaged switches provide up to 2 Gigabit Ethernet ports and are ideal for applications that require high-bandwidth data convergence. In particular, the EDS-210A-1GSFP-1SFP is equipped with 1 Gigabit fiber SFP slot, whereas the EDS-210A-1GTX-1GSFP-4SFP is equipped with 1 Gigabit fiber SFP slot and 1 Gigabit copper port.

The EDS-210A unmanaged switches are also equipped with multiple 100M ports, up to 4 100BaseSFP slots, and 8 100BaseTX copper ports for maximum flexibility in port combinations and long-distance communications.

The EDS-210A series provides 12/24/48 VDC redundant power inputs, rugged IP30-rated metal housing, DIN-rail mounting, and high level EMI/EMC capability. In addition to its compact size for space-saving installation, each EDS-210A has passed a 100% burn-in test to ensure its quality. Moreover, the EDS-210A series has an operating temperature range of -10 to the 60°C with wide temperature (-40 to 75°C) models also available.

All of these features make the EDS-210A ideal for applications that require high-bandwidth transmission and data converge for uplink, such as video surveillance, tolling systems, ITS, and factory automation.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3ab for 1000BaseT
IEEE 802.3z for 1000BaseX
Processing Type: Store and Forward

Switch Properties

MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, full/half duplex mode, and auto MDI/MDI-X connection, 10/100/1000 BaseT(X)*
*EDS-210A-1GTX-1GSFP-4SFP series only
Fiber Ports: 100BaseSFP slot and 1000BaseSFP slot

Power Requirements

Input Voltage: 12/24/48 VDC, redundant dual input
Operating Voltage: 9.6 to 60 VDC
Input Current: EDS-210A-1GSFP-1SFP: 0.39 A @ 24 V
EDS-210A-1GTX-1GSFP-4SFP: 0.39 A @ 24 V
Overload Current Protection: 3A
Connection: 2 removable 2-contact terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions:
45.8 x 134 x 105 mm (1.8 x 5.28 x 4.13 in)
Weight:
EDS-210A-1GSFP-1SFP: 520 g (1.15 lb)
EDS-210A-1GTX-1GSFP-4SFP: 570 g (1.26 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

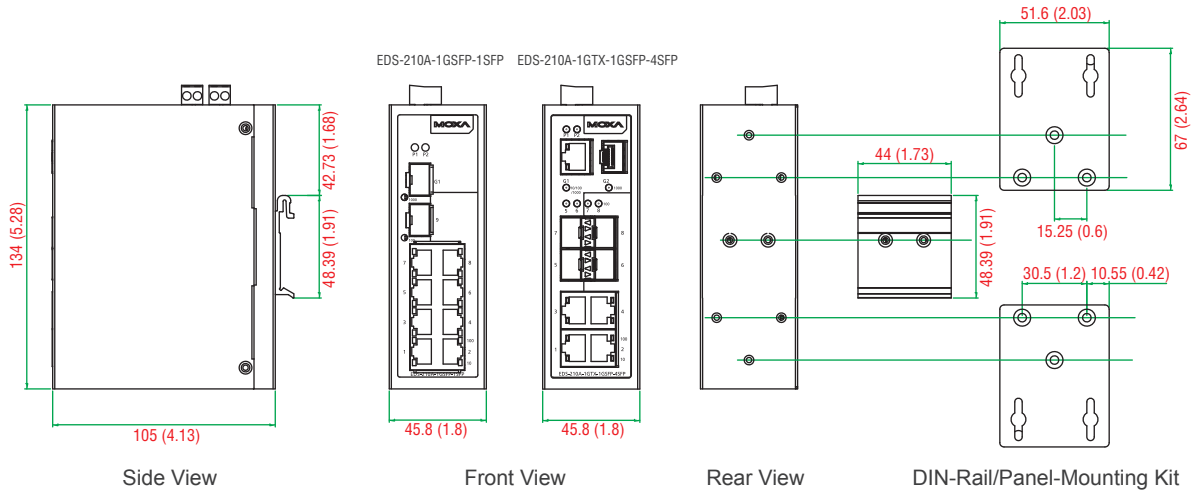
Time:
EDS-210A-1GSF-1SFP: 2,469,233 hrs
EDS-210A-1GTX-1GSF-4SFP: 2,485,402 hrs
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | DIN-Rail/Panel-Mounting Kit

Ordering Information

Available Models		Port Interface			
Standard Temperature (-10 to 60°C)	Wide Temperature (-40 to 75°C)	Gigabit Ethernet		Fast Ethernet	
		10/100/1000 BaseT(X)	1000BaseSFP	100BaseSFP	10/100BaseT(X)
EDS-210A-1GSFP-1SFP	EDS-210A-1GSFP-1SFP-T	0	1	1	8
EDS-210A-1GTX-1GSFP-4SFP	EDS-210A-1GTX-1GSFP-4SFP-T	1	1	4	4

Note: The EDS-210A series supports 100BaseSFP and 1000BaseSFP slots. See the SFP-1G and SFP-1FE datasheets for SFP module product information.

Optional Accessories (can be purchased separately)

DR-4524/75-24/120-24: 45/75/120 W DIN-rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-51-01: Wall-mounting kit, 2 plates with 6 screws
RK-4U: 4U-high 19-inch rack-mounting kit

Package Checklist

- EDS-210A switch
- Hardware installation guide (printed)
- Warranty card

EDS-205A/208A Series

5 and 8-port unmanaged Ethernet switches

- 10/100BaseT(X) (RJ45 connector), 100BaseFX (multi/single-mode, SC or ST connector)
- Redundant dual 12/24/48 VDC, 18 to 30 VAC power inputs
- IP30 aluminum housing
- Rugged hardware design well suited for hazardous locations (Class 1 Div. 2/ATEX Zone 2), Transportation (NEMA TS2/ EN 50121-4/e-Mark), and maritime environments (DNV/GL/LR/ABS/NK)
- -40 to 75°C operating temperature range (T models)

Introduction

The EDS-205A/208A series are 5 and 8-port industrial Ethernet switches that support IEEE 802.3 and IEEE 802.3u/x with 10/100M full/half-duplex, MDI/MDI-X auto-sensing. The EDS-205A/208A switches provide 12/24/48 VDC (9.6 to 60 VDC), 18 to 30 VAC redundant power inputs that can be connected simultaneously to live AC/DC power sources. These switches have been designed for harsh industrial environments, such as in maritime (DNV/GL/LR/ABS/NK), rail wayside, highway, or mobile applications(EN 50121-4/NEMA TS2/e-Mark), or hazardous locations (Class I Div. 2, ATEX Zone 2) that comply with FCC, UL, and CE standards.

The EDS-205A/208A switches are available with a standard operating temperature range from -10 to 60°C, or with a wide operating temperature range from -40 to 75°C. All models are subjected to a 100% burn-in test to ensure that they fulfill the special needs of industrial automation control applications. In addition, the EDS-205A/208A switches have DIP switches for enabling or disabling broadcast storm protection, providing another level of flexibility for industrial applications.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3x for Flow Control
Processing Type: Store and Forward

Switch Properties

MAC Table Size: 1 K
Packet Buffer Size: 512 kbit

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100BaseFX ports (SC/ST connector, multi-mode, single-mode)
DIP Switches: Enable/Disable broadcast storm protection

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Power Requirements

Input Voltage: 12/24/48 VDC, 18 to 30 VAC (47 to 63 Hz), redundant dual inputs
Operating Voltage: 9.6 to 60 VDC, 18 to 30 VAC (47 to 63 Hz)
Input Current: EDS-205A: 0.09 A @ 24 V
EDS-205A-M/S: 0.1 A @ 24 V
EDS-208A: 0.11 A @ 24 V
EDS-208A-M: 0.15 A @ 24 V
EDS-208A-MM/SS: 0.19 A @ 24 V
Overload Current Protection: 1.1 A
Connection: 1 removable 4-contact terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Aluminum
IP Rating: IP30 protection
Dimensions:
EDS-205A Series: 30 x 115 x 70 mm (1.18 x 4.52 x 2.76 in)
EDS-208A Series: 50 x 115 x 70 mm (1.96 x 4.52 x 2.76 in)
Weight:
EDS-205A Series: 175 g (0.39 lb)
EDS-208A Series: 275 g (0.61 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508
Hazardous Location: UL/cUL Class 1 Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nA nC IIC T4 Gc
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Wheeled Vehicles: e-Mark (E1) (EDS-208A only)
Traffic Control: NEMA TS2
Rail Traffic: EN 50121-4
Marine: DNV, GL, LR, ABS, NK
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

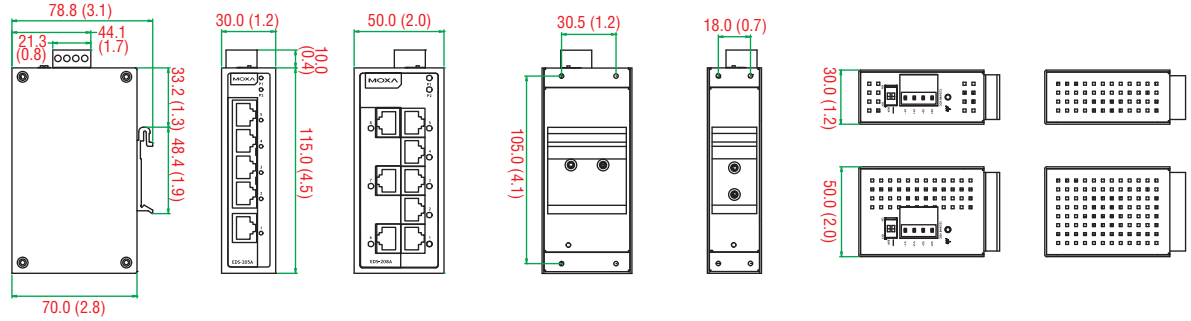
Time: EDS-205A Series: 3,040,784 hrs
EDS-208A Series: 2,428,212 hrs
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | Top & Bottom View

Ordering Information

Available Models		Port Interface			
			100BaseFX		
Standard Temperature (-10 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	Multi-Mode, SC Connector	Multi-Mode, ST Connector	Single-Mode, SC Connector
EDS-205A	EDS-205A-T	5	–	–	–
EDS-205A-M-SC	EDS-205A-M-SC-T	4	1	–	–
EDS-205A-M-ST	EDS-205A-M-ST-T	4	–	1	–
EDS-205A-S-SC	EDS-205A-S-SC-T	4	–	–	1
EDS-208A	EDS-208A-T	8	–	–	–
EDS-208A-M-SC	EDS-208A-M-SC-T	7	1	–	–
EDS-208A-M-ST	EDS-208A-M-ST-T	7	–	1	–
EDS-208A-MM-SC	EDS-208A-MM-SC-T	6	2	–	–
EDS-208A-MM-ST	EDS-208A-MM-ST-T	6	–	2	–
EDS-208A-S-SC	EDS-208A-S-SC-T	7	–	–	1
EDS-208A-SS-SC	EDS-208A-SS-SC-T	6	–	–	2

Optional Accessories (can be purchased separately)

DR-4524/75-24/120-24: 45/75/120 W DIN-rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-rail 24 VDC power supplies, -20 to 70°C operating temperature
RK-4U: 4U-high 19-inch rack-mounting kit
WK-30: Wall-mounting kit, 2 plates with 4 screws (EDS-205A series only)
WK-46: Wall-mounting kit, 2 plates with 8 screws (EDS-208A series only)

Package Checklist

- EDS-205A or EDS-208A switch
- Hardware installation guide (printed)
- Warranty card

EDS-205/208 Series

5 and 8-port entry-level unmanaged Ethernet switches

- 10/100BaseT(X) (RJ45 connector), 100BaseFX (multi-mode, SC/ST connectors)
- IEEE802.3/802.3u/802.3x support
- Broadcast storm protection
- DIN-rail mounting ability
- -10 to 60°C operating temperature range

Introduction

The EDS-205/208 series of industrial Ethernet switches are entry-level industrial 5 and 8-port Ethernet switches that support IEEE 802.3/802.3u/802.3x with 10/100M, full/half-duplex, MDI/MDIX auto-sensing RJ45 ports. The EDS-205/208 switches are rated to operate at temperatures ranging from -10 to 60°C, and are rugged enough for any harsh industrial environment. The switches can be easily installed on a DIN-rail as well as in distribution boxes. The DIN-rail mounting capability, wide operating temperature, and the IP30 housing with LED indicators make the plug-and-play EDS-205/208 switches easy to use and reliable.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3x for Flow Control
Processing Type: Store and Forward

Switch Properties

MAC Table Size: 1 K
Packet Buffer Size: 512 kbit

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100BaseFX ports (SC/ST connector, multi-mode)

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Power Requirements

Input Voltage:
EDS-205: 24 VDC (12 to 48 VDC), 18 to 30 VAC (47 to 63 Hz), single input
EDS-208 Series: 24 VDC (12 to 45 VDC), 18 to 30 VAC (47 to 63 Hz), single input
Input Current:
EDS-205: 0.11 A @ 24 V
EDS-208: 0.12 A @ 24 V
EDS-208-M: 0.2 A @ 24 V
Overload Current Protection: 1.1 A
Connection: 1 removable 3-contact terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Plastic
IP Rating: IP30 protection
Dimensions:
EDS-205: 24.9 x 100 x 86.5 mm (0.98 x 3.94 x 3.41 in)
EDS-208 Series: 40 x 100 x 86.5 mm (1.57 x 3.94 x 3.41 in)
Weight:
EDS-205: 135 g (0.30 lb)
EDS-208 Series: 170 g (0.38 lb)
Installation: DIN-rail mounting

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety:
EDS-205: UL 508, EN 60950-1
EDS-208 Series: UL 508
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 3 V
IEC 61000-4-8
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

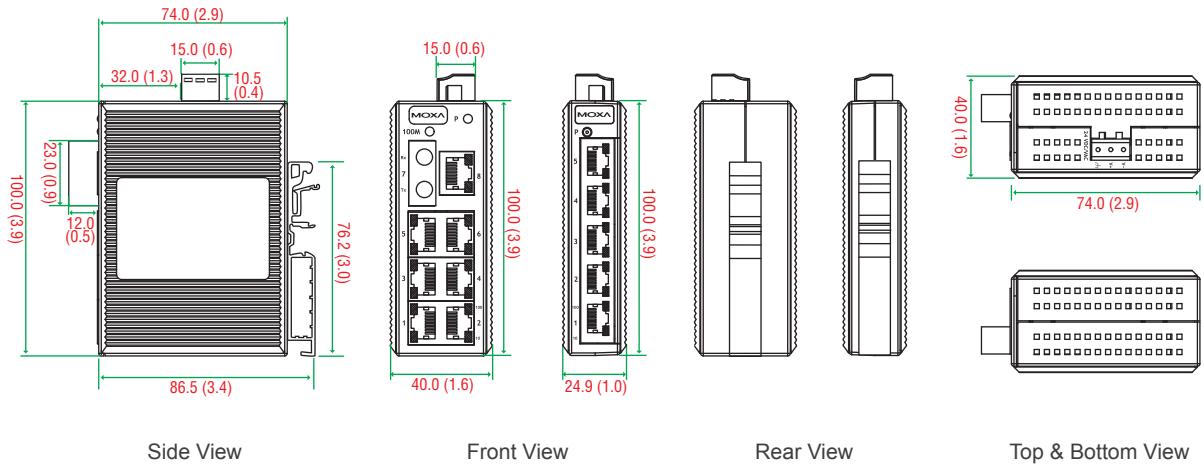
Time:
EDS-205: 3,915,945 hrs
EDS-208: 401,624 hrs
EDS-208-M-SC/ST: 368,353 hrs
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | Top & Bottom View

Ordering Information

Available Models	Port Interface			Housing Material	Power Range
Standard Temperature (-10 to 60°C)	10/100BaseT(X)	100BaseFX			
		Multi-Mode, SC Connector	Multi-Mode, ST Connector		
EDS-205	5	–	–	Plastic	12 to 48 VDC
EDS-208	8	–	–	Plastic	12 to 45 VDC
EDS-208-M-SC	7	1	–	Plastic	12 to 45 VDC
EDS-208-M-ST	7	–	1	Plastic	12 to 45 VDC

Optional Accessories (can be purchased separately)

DR-4524/75-24/120-24: 45/75/120 W DIN-rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-rail 24 VDC power supplies, -20 to 70°C operating temperature
RK-4U: 4U-high 19-inch rack-mounting kit

Package Checklist

- EDS-205 or EDS-208 switch
- Hardware installation guide (printed)
- Warranty card

IKS-6728A-8PoE Series

24+4G-port Gigabit modular managed PoE+ Ethernet switches

- 8 built-in PoE+ ports compliant with IEEE 802.3af/at
- Up to 36 W output per PoE+ port
- 3 kV LAN surge protection for extreme outdoor environments
- PoE diagnostics for powered-device mode analysis
- 4 Gigabit combo ports for high bandwidth communication
- -40 to 75°C operating temperature range at 720 W full loading
- Supports MXstudio for easy, visualized industrial network management
- V-ON™ ensures millisecond-level multicast data and video network recovery

Introduction

The Moxa IKS-6728A-8PoE series of Gigabit modular managed PoE+ Ethernet switches are designed to meet the demands of mission critical applications for business and industry. The IKS-6728A-8PoE comes standard with up to 24 10/100BaseT(X), or PoE/PoE+, and 4 combo Gigabit Ethernet ports. The IKS-6728A-8PoE Ethernet switches provide up to 30 watts of power per PoE+ port in standard mode, and also support high power output of up to 36 watts for heavy-duty industrial PoE devices, such as weather-proof IP surveillance cameras with wipers/heaters, high-performance wireless access points, and rugged IP phones. IKS-6728A-8PoE Ethernet switches support two types of power input sources: 48 VDC for PoE+ ports and system power, and 110/220 VAC for system power. These Ethernet switches also support a variety of management functions, including STP/RSTP, Turbo Ring, Turbo Chain, PoE power management, PoE device auto-checking, PoE power scheduling, PoE diagnostic, IGMP, VLAN, QoS, RMON, bandwidth management, and port mirroring. The IKS-6728A-8PoE series is designed especially for harsh outdoor applications with 3kV surge protection to ensure the uninterrupted reliability of PoE systems.

Features and Benefits

- Advanced PoE management functions: PoE output setting, PD failure check, PoE scheduling, and PoE diagnostics
- Command Line Interface (CLI) for quickly configuring major managed functions
- Software-based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP and Modbus/TCP protocols for device management and monitoring
- Compatible with PROFINET protocol for transparent data transmission
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- TACACS+, IEEE 802.1X, SNMPv3, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status with “Lock port” to restrict access to authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email, relay output
- Automatic recovery of connected device’s IP addresses
- Line-swap fast recovery
- Configurable by web browser, Telnet/serial console, CLI, Windows utility, and ABC-02-USB automatic backup configurator

Specifications

Technology

Standards:
IEEE 802.3af/at for PoE/PoE+ output
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2/v3, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Broadcast Storm Protection, Port Lock
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 2048
MAC Table Size: 16 K
Packet Buffer Size: 12 Mbit
Jumbo Frame Size: 9.6 KB

Interface

Fast Ethernet: 8-port 10/100BaseT(X) or PoE+ 10/100BaseT(X) 2 modular slots for any 8-, or 6-port Interface Modules with 10/100BaseT(X), 100BaseFX (SC/ST connector), 100Base SFP, or PoE+ 10/100BaseT(X)
Note: See the IM-6700A datasheet for Fast Ethernet module and PoE+ module product information.
Gigabit Ethernet: 4-port 10/100/1000BaseT(X) or 100/1000Base SFP
Console Port: USB-serial console (Type B connector)
Storage Port: USB storage (Type A connector for ABC-02-USB)
Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC

Power Requirements

Input Voltage:
HV models:
• 110/220 VAC for switch system
• 48 VDC for PoE system (53 to 57 VDC is recommended for PoE+ devices)
48 VDC models:
• 48 VDC (46 to 57 VDC) for switch and PoE system
Operating Voltage:
HV models:
• 85 to 264 VAC for switch system
• 46 to 57 VDC for PoE system
48 VDC models:
• 46 to 57 VDC for Switch and PoE system

Modular Rackmount Ethernet Switch System, IKS-6728A-8PoE series

IKS-6728A-8PoE-4GTXSFP-HV-T
IKS-6728A-8PoE-4GTXSFP-HV-HV-T
IKS-6728A-8PoE-4GTXSFP-48-T
IKS-6728A-8PoE-4GTXSFP-48-48-T

Input Current:
HV models:
• PWR input current (switch system):
Max. 0.33 A @ 110 VAC
Max. 0.24 A @ 230 VAC
• EPS input current (PoE system):
Max. 0.29 A @ 48 VDC (excluding power consumption of PoE devices)
48 VDC models:
• PWR/EPS input current (switch and PoE systems):
Max. 0.53 A @ 48 VDC (excluding power consumption of PoE devices)
Overload Current Protection: Present
Reverse Polarity Protection: Present

Physical Characteristics

IP Rating: IP30 protection
Dimensions: 440 x 44 x 280 mm (17.32 x 1.37 x 11.02 in)
Weight: IKS-6728A-8PoE-4GTXSFP-HV-HV-T: 4250 g (9.38 lb)
IKS-6728A-8PoE-4GTXSFP-HV-T: 4150 g (9.15 lb)
IKS-6728A-8PoE-4GTXSFP-48-48-T: 4250 g (9.38 lb)
IKS-6728A-8PoE-4GTXSFP-48-T: 4150 g (9.15 lb)
Installation: 19-inch rack mounting

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 55022/24
EMI: FCC Part 15 Subpart B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 3 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Rail Traffic: EN 50121-4
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time:
IKS-6728A-8PoE-4GTXSFP-48-T: 224,420 hrs
IKS-6728A-8PoE-4GTXSFP-48-48-T: 215,994 hrs
IKS-6728A-8PoE-4GTXSFP-HV-T: 159,173 hrs
IKS-6728A-8PoE-4GTXSFP-HV-HV-T: 120,731hrs
Standard: Telcordia (Bellcore), GB

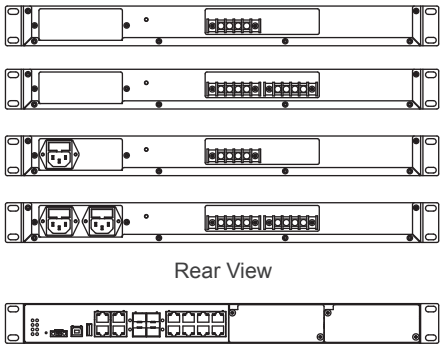
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

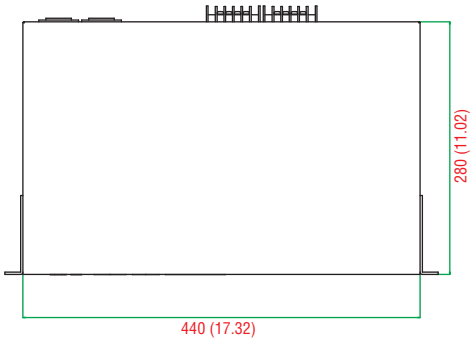
Unit: mm (inch)

IKS-6728A-8PoE-4GTXSFP Series

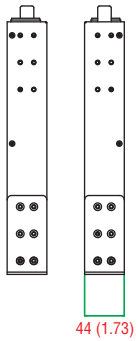


Rear View

Front View



Top View



Side View

Ordering Information

Step 1: Select Ethernet switch system

IKS-6728A-8PoE with power supply

Step 2: Select interface modules

IM-6700A modules (PoE+/Fast Ethernet)

Note: The IKS-6728A-8PoE Ethernet switch system is delivered without interface modules. See the IM-6700A datasheet to determine which interface modules are suitable for your application.

IKS-6728A-8PoE Modular Rackmount Ethernet PoE+ Switch System

Modular managed rackmount Ethernet PoE+ switch with 8 built-in 10/100BaseT(X) PoE+ ports, 4 Gigabit Copper/SFP combo ports, and 2 slots for Fast Ethernet PoE+ modules. Support up to 24+4G ports with 8 built-in PoE+ ports and up to 24 PoE+ ports, -40 to 75°C operating temperature.

Available Models	Port Interface				Power Supply			
	Gigabit Ethernet	Fast Ethernet			Isolated Power Supply 1		Isolated Power Supply 2	
Front Cabling, Wide Temperature (-40 to 75 °C)	10/100/1000BaseT(X) or 100/1000BaseSFP*	10/100BaseT(X) (or PoE+ ports)	100BaseFX	100BaseSFP*	HV (85 to 264 VAC)	48 VDC (46 to 57 VDC)	HV (85 to 264 VAC)	48 VDC (46 to 57 VDC)
IKS-6728A-8PoE Series								
IKS-6728A-8PoE-4GTXSFP-HV-T	4	Up to 24	Up to 12	Up to 20	1	–	–	–
IKS-6728A-8PoE-4GTXSFP-HV-HV-T	4	Up to 24	Up to 12	Up to 20	1	–	1	–
IKS-6728A-8PoE-4GTXSFP-48-T	4	Up to 24	Up to 12	Up to 20	–	1	–	–
IKS-6728A-8PoE-4GTXSFP-48-48-T	4	Up to 24	Up to 12	Up to 20	–	1	–	1

Note:
The IKS-6728A-8PoE series needs an external 48 VDC (46 to 57 VDC) power supply for PoE+ output
The IKS-6728A-8PoE series supports up to 24 PoE+ ports. 8 PoE+ ports are built in. Two IM-6700A-8PoE modules can add up to 16 more PoE+ ports.
The IKS-6728A-8PoE series supports 100BaseSFP and 100/1000BaseSFP slots. Please the SFP-1G and SFP-1FE datasheets for SFP module product information

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-02-USB: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
Power Cords: See Appendix A for details

Package Checklist

- IKS-6728A-8PoE switch
- USB Cable: CBL-USBA/B-100
- AC power cord (US type x1, EU type x1, HV model only)
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

EDS-G512E-8PoE-4GSFP Series

12G-port full gigabit PoE+ managed Ethernet switches

- 12 10/100/1000BaseT(X) ports and 4 100/1000BaseSFP ports
- 8 IEEE 802.3af and IEEE 802.3at PoE+ standard ports
  - 36-watt output per PoE+ port in high-power mode
  - Intelligent PoE power management functions
- Operate with 240 watts full PoE+ loading at -40 to 75°C
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- Supports MXstudio for easy, visualized industrial network management
- V-ON™ ensures millisecond-level multicast data and video network recovery

Introduction

The EDS-G512E-8PoE Series are full gigabit managed PoE+ Ethernet switches that come standard with 8 10/100/1000BaseT(X), 802.3af (PoE), and 802.3at (PoE+)-compliant Ethernet ports, and up to 4 fiber optic ports.

With the gigabit Ethernet PoE+ ports, it is perfect for high bandwidth PD device communications, such as IEEE 802.11n and IEEE 802.1ac wireless access points and high resolution GigE machine vision cameras for tolling systems. It can provide up to 30 watts of power per PoE+ port in standard mode and allow high power output of up to 36 watts for industrial heavy-duty PoE devices, such as weather-proof IP surveillance cameras with wipers/heaters, and rugged IP phones.

The EDS-G512E-8PoE Ethernet switches are highly versatile, and the SFP fiber ports can transmit data up to 120 km from the device to the control center with high EMI immunity. The Ethernet switches support a variety of management functions, including STP/RSTP, Turbo Ring, Turbo Chain, PoE power management, PoE device auto-checking, PoE power scheduling, IGMP, VLAN, QoS, RMON, bandwidth management, and port mirroring.

Features and Benefits

- Advanced PoE management function (PoE port setting, PD failure check, and PoE scheduling)
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- Command Line Interface (CLI) for quickly configuring major managed functions
- IEEE 1588 PTP V2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP, PROFINET, and Modbus/TCP protocols for device management and monitoring
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- TACACS+, IEEE 802.1X, SNMPv3, HTTPS, and SSH to enhance network security
- Lock port function for blocking unauthorized access based on MAC address
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management to prevent unpredictable network status
- Port mirroring for online debugging
- Lock port function for blocking unauthorized access based on MAC address
- Automatic warning by exception through e-mail, relay output Features and Benefits
- ABC-02-USB (Automatic Backup Configurator) for system

Specifications

Technology

Standards:
IEEE 802.3af/at for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2/v3, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Broadcast Storm Protection, Port Lock
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP, PROFINET IO

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 256

VLAN ID Range: VID 1 to 4094
IGMP Groups: 2048
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit
Jumbo Frame Size: 9.6 KB

Interface

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed
Fiber Ports: 100/1000BaseSFP slot
Console Port: USB-serial console (Type B connector)
Storage Port: USB storage (Type A connector for ABC-02-USB)
PoE Pinout: V+, V+, V-, V-, for pin 1, 2, 3, 6 (Endspan, MDI, Mode A)
DIP Switches: Turbo Ring, Master, Coupler, Reserve
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 1 input with the same ground, but electrically isolated from the electronics.
- +13 to +30 V for state "1"
- -30 to +3 V for state "0"
- Max. input current: 8 mA

Button: Reset button

Power Requirements

Input Voltage: 48 VDC, redundant dual inputs
Operating Voltage: 44 to 57 VDC (> 50 VDC for PoE+ output recommended)
Input Current: 5.42 A @ 48 VDC
Overload Current Protection: Present
Connection: 2 removable 4-contact terminal blocks
Reverse Polarity Protection: Present
Note: When selecting power supply, check the PD power consumption.
Power Consumption: Max. 20.16 W full loading without PDs' consumption
Power Budget:
Max. 240 W for total PD consumption
Max. 36 W for each PoE port

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 79.2 x 135 x 137 mm (3.1 x 5.3 x 5.4 in)
Weight: 1540 g (3.40 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508, EN60950-1 (LVD)
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: Signal: 10 kV
IEC 61000-4-8
Electrical Substations: IEC 61850-3, IEEE 1613
Rail Traffic: EN 50121-4
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

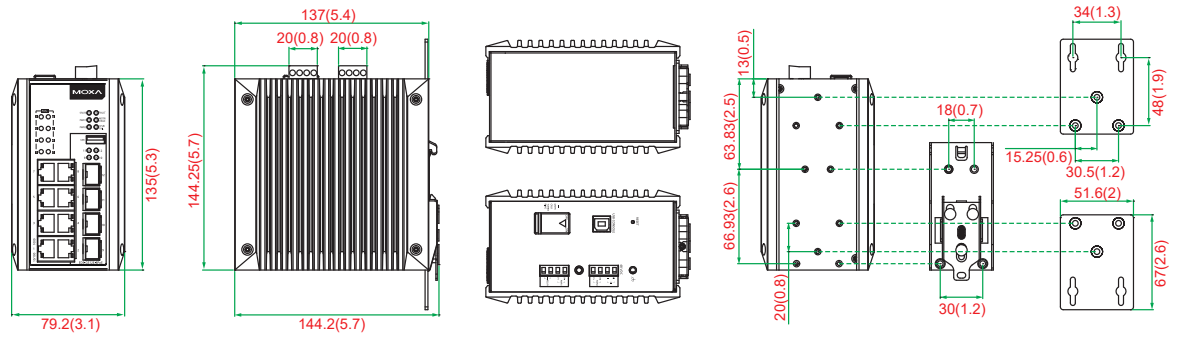
Time: 361,368 hrs.
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Front View | Side View | Top / Bottom Views | Rear View | DIN-Rail/Panel-Mounting Kit

Ordering Information

Available Models		Port Interface	
Standard Temperature (-10 to 60°C)	Wide Temperature (-40 to 75°C)	PoE+, 10/100/1000BaseT(X)	100/1000BaseSFP*
EDS-G512E-8PoE-4GSFP	EDS-G512E-8PoE-4GSFP-T	8	4

*Note: The EDS-G512E-8PoE series supports up to 4 100/1000BaseSFP slots. See page 4 and 5 for SFP-1G/1FE series Gigabit/Fast Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-02-USB: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
DR-75-48/120-48: 75/120 W DIN-rail 48 VDC power supplies
DRP-240-48: 240 W DIN-rail 48 VDC power supplies
SDR-480P-48: 480 W DIN-rail 48 VDC power supplies
WK-51-01: Wall-mounting kit, 2 plates with 6 screws
RK-4U: 4U-high 19-inch rack-mounting kit

Package Checklist

- EDS-G512E-8PoE switch
- USB Cable: CBL-USBA/B-100
- Protective caps for unused ports
- Documentation and software CD
- Warranty card
- Hardware installation guide (printed)

EDS-P510A-8PoE Series

8+2G-port Gigabit PoE+ managed Ethernet switches with 8 IEEE 802.3af/at PoE+ ports

- Built-in 8 PoE+ ports compliant with IEEE 802.3af/at standards
- Up to 36 W output per PoE+ port
- 3 kV LAN surge protection for extreme outdoor environments
- PoE diagnostic for powered device mode analysis
- 2 Gigabit combo ports for high-bandwidth and long-distance communication
- Operates with 240 watts full PoE+ loading at -40 to 75°C
- Supports MXstudio for easy, visualized industrial network management
- V-ON™ ensures millisecond-level multicast data and video network recovery

Introduction

The Moxa EDS-P510A-8PoE Series are Gigabit managed PoE+ Ethernet switches that come standard with 8 10/100BaseT(X), 802.3af (PoE), and 802.3at (PoE+)-compliant Ethernet ports, and 2 combo Gigabit Ethernet ports. The EDS-P510A-8PoE Ethernet switches provide up to 30 watts of power per PoE+ port in standard mode and allow high power output of up to 36 watts for industrial heavy-duty PoE devices, such as weather-proof IP surveillance cameras with wipers/heaters, high-performance wireless access points, and rugged IP phones. The EDS-P510A-8PoE Ethernet switches are highly versatile, and the SFP fiber ports can transmit data up to 120 km from the device to the control center with high EMI immunity. The Ethernet switches support a variety of management functions, including STP/RSTP, Turbo Ring, Turbo Chain, PoE power management, PoE device auto-checking, PoE power scheduling, PoE diagnostic, IGMP, VLAN, QoS, RMON, bandwidth management, and port mirroring. The EDS-P510A-8PoE series is designed especially for harsh outdoor applications with 3 kV surge protection to ensure uninterrupted reliability of PoE systems.

Features and Benefits

- Advanced PoE management function (PoE output setting, PD failure check, PoE scheduling, and PoE diagnostic)
- Command Line Interface (CLI) for quickly configuring major managed functions
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Software-based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP and Modbus/TCP protocol for device management and monitoring
- Compatible with PROFINET protocol for transparent data transmission
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- TACACS+, IEEE 802.1X, SNMPv3, HTTPS, and SSH to enhance network security
- Lock port function for blocking unauthorized access based on MAC address
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management to prevent unpredictable network status
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output

Specifications

Technology

Standards:
IEEE 802.3af/at for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Port Lock
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 1024
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit

Interface

RJ45 Ports: 10/100BaseT(X) or 10/100/1000BaseT(X) auto negotiation speed
Fiber Ports: 100/1000BaseSFP slot
Console Port: RS-232 (RJ45 connector)
PoE Pinout: V+, V+, V-, V- for pin 1, 2, 3, 6 (Endspan, MDI, Mode A)
DIP Switches: Turbo Ring, Master, Coupler, Reserve
Alarm Contact: 1 relay output with current carrying capacity of 0.5 A @ 48 VDC
Digital Inputs: 1 input with the same ground, but electrically isolated from the electronics.
• +13 to +30 V for state "1"
• -30 to +3 V for state "0"
• Max. input current: 8 mA

Power Requirements

Input Voltage: 48 VDC, redundant dual inputs
Operating Voltage: 44 to 57 VDC
Input Current: 5.36 A @ 48 VDC
Overload Current Protection: Present
Connection: 2 removable 2-contact terminal blocks
Reverse Polarity Protection: Present
Power Consumption: Max. 17.28 W full loading without PDs' consumption
Power Budget:
Max. 240 W for total PDs' consumption
Max. 36 W for each PoE port

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 79.2 x 135 x 105 mm (3.12 x 5.31 x 4.13 in)
Weight: 1030 g (2.28 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508
Hazardous Location: UL/cUL Class 1 Division 2
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Traffic Control: NEMA-TS2
Rail Traffic: EN 50121-4
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

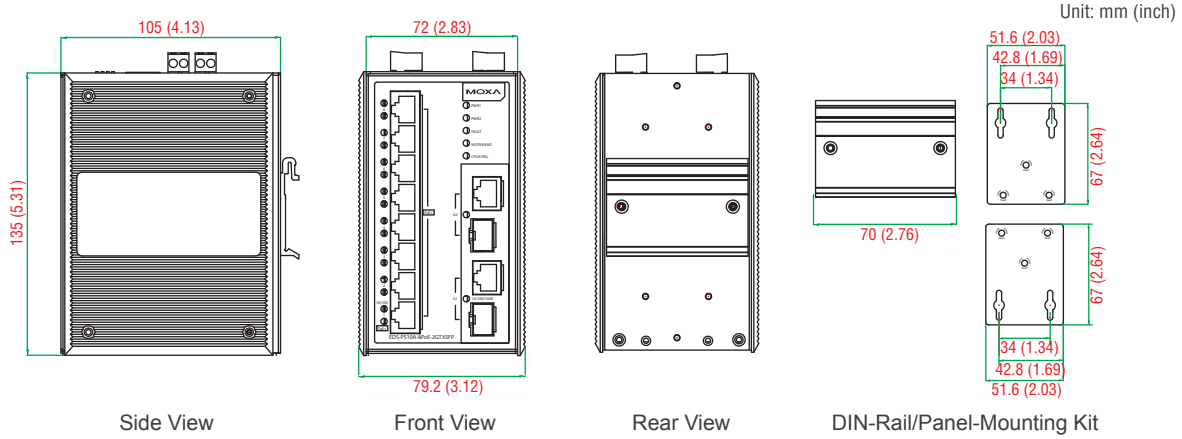
Time: 710,166 hrs
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models		Port Interface	
		Gigabit Ethernet	Fast Ethernet
Standard Temperature (-10 to 60°C)	Wide Temperature (-40 to 75°C)	Combo Port, 10/100/1000BaseT(X) or 100/1000BaseSFP*	PoE+, 10/100BaseT(X)
EDS-P510A-8PoE-2GTXSFP	EDS-P510A-8PoE-2GTXSFP-T	2	8

*The EDS-P510A-8PoE series supports 2 100/1000BaseSFP slots. See the SFP-1G and SFP-1FE datasheets for Gigabit/Fast Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
DR-75-48/120-48: 75/120 W DIN-rail 48 VDC power supplies
DRP-240-48: 240 W DIN-rail 48 VDC power supplies
RK-4U: 4U-high 19-inch rack-mounting kit
WK-46: Wall-mounting kit, 2 plates with 8 screws

Package Checklist

- EDS-P510A-8PoE switch
- Serial Cable: CN20070
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

EDS-P510 Series

7+3G-port Gigabit managed Ethernet switches with 4 IEEE 802.3af PoE ports

- 4 IEEE 802.3af-compliant PoE and Ethernet combo ports
- Provides up to 15.4 watts at 48 VDC per PoE port
- Intelligent power consumption detection, PD failure check, and PoE scheduling function
- 3 combo (10/100/1000BaseT(X) or 100/1000BaseSFP slot) Gigabit ports; 2 ports for redundant ring and 1 port for uplink
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- Supports MXstudio for easy, visualized industrial network management
- V-ON™ ensures millisecond-level multicast data and video network recovery

Introduction

The EDS-P510 series Gigabit managed redundant Ethernet switches come standard with 4 10/100BaseT(X) 802.3af (PoE) compliant Ethernet ports and 3 combo Gigabit Ethernet ports. The EDS-P510 switches provide up to 15.4 watts of power per PoE port, and allow power to be supplied to connected devices (such as surveillance cameras, wireless access points, and IP phones) when AC power is not readily available or is cost-prohibitive to provide locally. The EDS-P510 switches are highly versatile, and their SFP fiber port can transmit data up to 80 km from the device to the control center with high EMI immunity. The Ethernet switches support advanced management and security features. The EDS-P510 series is designed especially for security automation applications such as IP surveillance, and gate of entry systems, which can benefit from a scalable backbone construction and Power-over-Ethernet support.

Features and Benefits

- Advanced PoE management function (PoE port setting, PD failure check, and PoE scheduling)
- Command Line Interface (CLI) for quickly configuring major managed functions
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Software-based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP and Modbus/TCP protocols for device management and monitoring
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- TACACS+, IEEE 802.1X, SNMPv3, HTTPS, and SSH to enhance network security
- Lock port function for blocking unauthorized access based on MAC address
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management to prevent unpredictable network status
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output

Specifications

Technology

Standards:
IEEE 802.3af for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Port Lock
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 1024
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit

Interface

RJ45 Ports: 10/100BaseT(X) or 10/100/1000BaseT(X) auto negotiation speed
Fiber Ports: 100/1000BaseSFP slot
Console Port: RS-232 (RJ45 connector)
PoE Pinout: V+, V+, V-, V- for pin 1, 2, 3, 6 (Endspan, MDI Alternative A)
DIP Switches: Turbo Ring, Master, Coupler, Reserve
Alarm Contact: 2 relay outputs with current carrying capacity of 0.5 A @ 48 VDC
Digital Inputs: 2 inputs with the same ground, but electrically isolated from the electronics.
- +13 to +30 V for state "1"
- -30 to +3 V for state "0"
- Max. input current: 8 mA

Power Requirements

Input Voltage: 48 VDC, redundant dual inputs
Operating Voltage: 44 to 57 VDC
Input Current: 1.58 A @ 48 VDC
Overload Current Protection: Present
Connection: 2 removable 6-contact terminal blocks
Reverse Polarity Protection: Present
Power Consumption: Max. 14.24 W full loading without PDs' consumption
Power Budget: Max. 61.6 W for total PDs' consumption
Max. 15.4 W for each PoE port

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 80.2 x 135 x 105 mm (3.16 x 5.31 x 4.13 in)
Weight: 1170 g (2.58 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Marine: DNV, GL, LR, ABS, NK
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

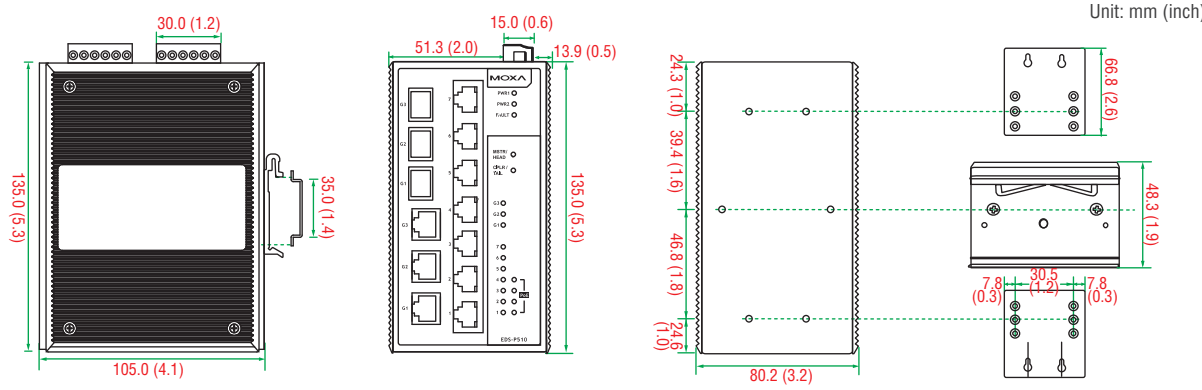
Time: 205,384 hrs
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | DIN-Rail/Panel-Mounting Kit

Ordering Information

Available Models		Port Interface		
		Gigabit Ethernet	Fast Ethernet	
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	Combo Port, 10/100/1000BaseT(X) or 100/1000BaseSFP*	PoE, 10/100BaseT(X)	10/100BaseT(X)
EDS-P510	EDS-P510-T	3	4	3

*The EDS-P510 series supports 3 100/1000BaseSFP slots. See the SFP-1G and SFP-1FE datasheets for Gigabit/Fast Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
DR-75-48/120-48: 75/120 W DIN-rail 48 VDC power supplies
DRP-240-48: 240 W DIN-rail 48 VDC power supplies
RK-4U: 4U-high 19-inch rack-mounting kit
WK-46: Wall-mounting kit, 2 plates with 8 screws

Package Checklist

- EDS-P510 switch
- Serial Cable: CN20070
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

EDS-P506A-4PoE Series

Award-winning Product

6-port managed Ethernet switches with 4 IEEE 802.3af/at PoE+ ports

- 4 IEEE 802.3af/at compliant PoE and Ethernet combo ports
- Up to 30 watts per PoE port
- 24/48 VDC wide range redundant power inputs
- Advanced PoE management functions, including PD failure check and PoE scheduling
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- -40 to 75°C operating temperature range (T models)
- Supports MXstudio for easy, visualized industrial network management

Introduction

The EDS-P506A-4PoE series managed redundant Ethernet switches come standard with 4 10/100BaseT(X) 802.3at (PoE+) and 802.3af (PoE) compliant Ethernet ports and 2 10/100BaseT(X) or 2 10/100BaseFX Ethernet ports. The EDS-P506A-4PoE switches provide up to 30 watts of power per PoE port, and allow power to be supplied to connected high-power devices when AC power is not readily available or is cost-prohibitive to provide locally. The EDS-P506A-4PoE series is designed especially for security automation applications such as IP surveillance, and gate of entry systems, which can benefit from a scalable backbone construction and Power-over-Ethernet support.

Features and Benefits

- Advanced PoE management function (PoE port setting, PD failure check, and PoE scheduling)
- 24/48 VDC wide range redundant power inputs
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Command Line Interface (CLI) for quickly configuring major managed functions
- Software-based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- Support EtherNet/IP and Modbus/TCP protocols for device management and monitoring
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security

Specifications

Technology

Standards:
IEEE 802.3af/at for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Port Lock
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100BaseFX ports (SC/ST connector)
Console Port: RS-232 (RJ45 connector)
PoE Pinout: V+, V+, V-, V- for pin 1, 2, 3, 6 (Endspan, MDI Alternative A)
DIP Switches: Turbo Ring, Master, Coupler, Reserve
Alarm Contact: 2 relay outputs with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 inputs with the same ground, but electrically isolated from the electronics.
• +13 to +30 V for state "1"
• -30 to +3 V for state "0"
• Max. input current: 8 mA

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Power Requirements

Input Voltage: 24/48 VDC, redundant dual inputs
Operating Voltage: 22 to 57 VDC
Input Current: 5.72 A @ 24 VDC
Connection: 2 removable 6-contact terminal blocks
Reverse Polarity Protection: Present
Power Consumption: Max. 17.28 W full loading without PDs' consumption
Power Budget: Max. 120 W for total PDs' consumption
Max. 30 W for each PoE port

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 80 x 135 x 131.5 mm (3.15 x 5.31 x 5.18 in)
Weight: 1270 g (2.80 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Rail Traffic: EN 50121-4
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

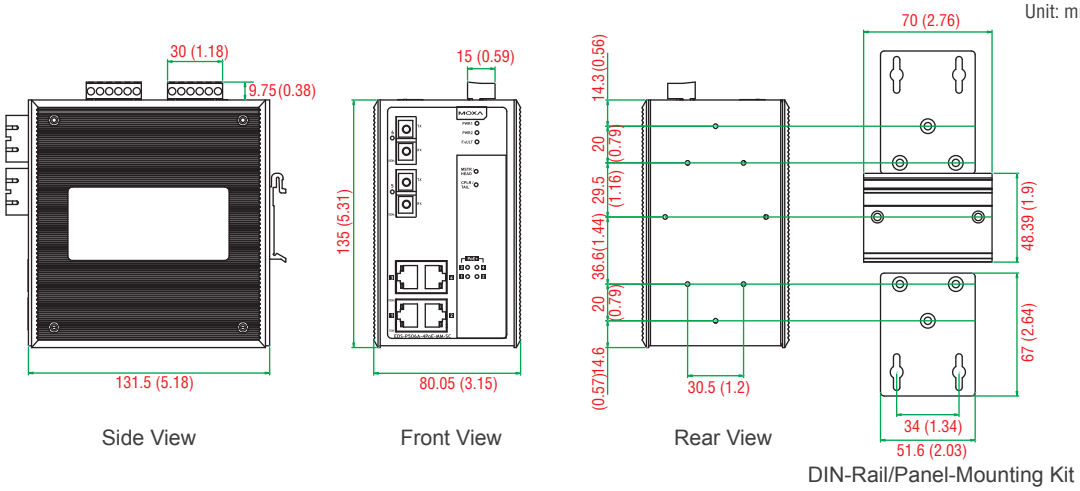
Time: 433,000 hrs
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | DIN-Rail/Panel-Mounting Kit

Ordering Information

Available Models		Port Interface				
				100BaseFX		
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	PoE+, 10/100BaseT(X)	10/100BaseT(X)	Multi-Mode SC Connector	Multi-Mode ST Connector	Single-Mode SC Connector
EDS-P506A-4PoE	EDS-P506A-4PoE-T	4	2	–	–	–
EDS-P506A-4PoE-MM-SC	EDS-P506A-4PoE-MM-SC-T	4	–	2	–	–
EDS-P506A-4PoE-MM-ST	EDS-P506A-4PoE-MM-ST-T	4	–	–	2	–
EDS-P506A-4PoE-SS-SC	EDS-P506A-4PoE-SS-SC-T	4	–	–	–	2

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
DR-75-24/120-24: 75/120 W DIN-rail 24 VDC power supplies
DR-75-48/120-48: 75/120 W DIN-rail 48 VDC power supplies
DRP-240-48: 240 W DIN-rail 48 VDC power supplies
WK-51-01: Wall-mounting kit, 2 plates with 6 screws
RK-4U: 4U-high 19-inch rack-mounting kit

Package Checklist

- EDS-P506A-4PoE switch
- Serial Cable: CN20070
- Protective caps for unused ports
- Document and software CD
- Hardware installation guide (printed)
- Warranty card

EDS-G205A-4PoE Series

Award-winning Product
TAIWAN EXCELLENCE 2013

5-port full Gigabit unmanaged Ethernet switches with 4 IEEE 802.3af/at PoE+ ports

- Full Gigabit Ethernet ports
- IEEE 802.3af/at, PoE+ standards
- Up to 30 watts output per PoE port
- 24/48 VDC flexible redundant power inputs
- Supports 9.6 KB jumbo frames
- Intelligent power consumption detection and classification
- Smart PoE over current and short circuit protection
- -40 to 75°C operating temperature range (T models)

Introduction

The EDS-G205A-4PoE switches are smart, 5-port, unmanaged full Gigabit Ethernet switches supporting Power-over-Ethernet on ports 2 to 5. The switches are classified as power source equipment (PSE), and when used in this way, the EDS-G205A-4PoE switches enable centralization of the power supply, providing up to 30 watts of power per port and reducing the effort needed for installing power. The switches can be used to power IEEE 802.3af/at standard devices (PD), eliminating the need for additional wiring, and they support IEEE 802.3/802.3u/802.3x with 10/100/1000M, full/half-duplex, MDI/MDI-X auto-sensing to provide an economical high-bandwidth solution for your industrial Ethernet network.

Specifications

Technology

Standards:
IEEE 802.3af/at for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3ab for 1000BaseT
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
Processing Type: Store and Forward

Switch Properties

MAC Table Size: 8 K
Packet Buffer Size: 136 KB
Jumbo Frame Size: 9.6 KB

Interface

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 1000BaseSFP slot
PoE Pinout: V+, V+, V-, V- for Pin 1,2,3,6 (Endspan, MDI Alternative A)

Power Requirements

Input Voltage: 12/24/48 VDC, redundant dual inputs
Operating Voltage: 12 to 57 VDC
Input Current: 5.42 A @ 24 VDC
Overload Current Protection: Present
Connection: 2 removable 2-contact terminal blocks
Reverse Polarity Protection: Present
Power Consumption: Max. 10.08 W full loading without PDs' consumption
Power Budget: Max. 62 W at 12 VDC, 120 W at 24 VDC, and 144 W at 48 VDC for total PDs' consumption,
Max. 36 W for each PoE port

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 29 x 135 x 105 mm (1.14 x 5.31 x 4.13 in)
Weight: 300 g (0.66 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Rail Traffic: EN 50121-4
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

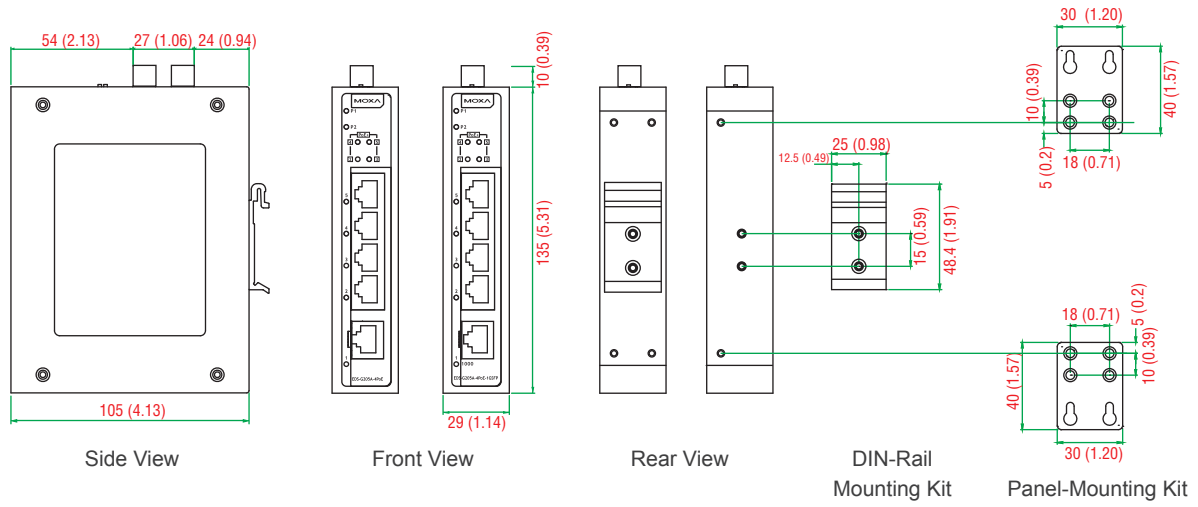
Time: 1,257,910 hrs
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | DIN-Rail Mounting Kit | Panel-Mounting Kit

Ordering Information

Available Models		Port Interface		
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100/1000BaseT(X)	1000BaseSFP*	PoE/PoE+, 10/100/1000BaseT(X)
EDS-G205A-4PoE	EDS-G205A-4PoE-T	5	–	4
EDS-G205A-4PoE-1GSFP	EDS-G205A-4PoE-1GSFP-T	4	1	4

*See the SFP-1G datasheet for SFP module product information.

Optional Accessories (can be purchased separately)

DR-75-24/120-24: 75/120 W DIN-rail 24 VDC power supplies
DR-75-48/120-48: 75/120 W DIN-rail 48 VDC power supplies
DRP-240-48: 240 W DIN-rail 48 VDC power supplies
RK-4U: 4U-high 19-inch rack-mounting kit
WK-30: Wall-mounting kit, 2 plates with 4 screws

Package Checklist

- EDS-G205A-4PoE switch
- Hardware installation guide (printed)
- Warranty card

EDS-P206A-4PoE Series

6-port unmanaged Ethernet switches with 4 IEEE 802.3af/at PoE+ ports

- IEEE 802.3af/at compliant PoE and Ethernet combo ports
- Up to 30 watts per PoE port
- 24/48 VDC wide range redundant power inputs
- Intelligent power consumption detection and classification
- Redundant dual VDC power inputs
- -40 to 75°C operating temperature range (T models)

Introduction

The EDS-P206A-4PoE switches are smart, 6-port, unmanaged Ethernet switches supporting PoE (Power-over-Ethernet) on ports 1 to 4. The switches are classified as power source equipment (PSE), and when used in this way, the EDS-P206A-4PoE switches enable centralization of the power supply and provide up to 30 watts of power per port. The switches can be used to power IEEE 802.3af/at compliant powered devices (PD), eliminating the need for additional wiring, and support IEEE 802.3/802.3u/802.3x with 10/100M, full/half-duplex, MDI/MDI-X auto-sensing to provide an economical solution for your industrial Ethernet network.

Specifications

Technology

Standards:
IEEE 802.3af/at for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control
Processing Type: Store and Forward

Switch Properties

MAC Table Size: 1 K
Packet Buffer Size: 512 KB

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100BaseFX ports (SC/ST connector)
PoE Pinout: V-, V-, V+, V+ for pin 1, 2, 3, 6 (Endspan, MDI-X Alternative A)

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Power Requirements

Input Voltage: 24/48 VDC, redundant dual inputs
Operating Voltage: 22 to 57 VDC
Input Current: 5.48 A @ 24 VDC
Overload Current Protection: Present
Connection: 1 removable 4-contact terminal block
Reverse Polarity Protection: Present
Power Consumption: Max. 11.52 W full loading without PDs' consumption
Power Budget: Max. 120 W for total PDs' consumption
Max. 30 W for each PoE port

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 50.3 × 115 × 70 mm (1.98 x 4.53 x 2.76 in)
Weight: 375 g (0.83 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8

Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

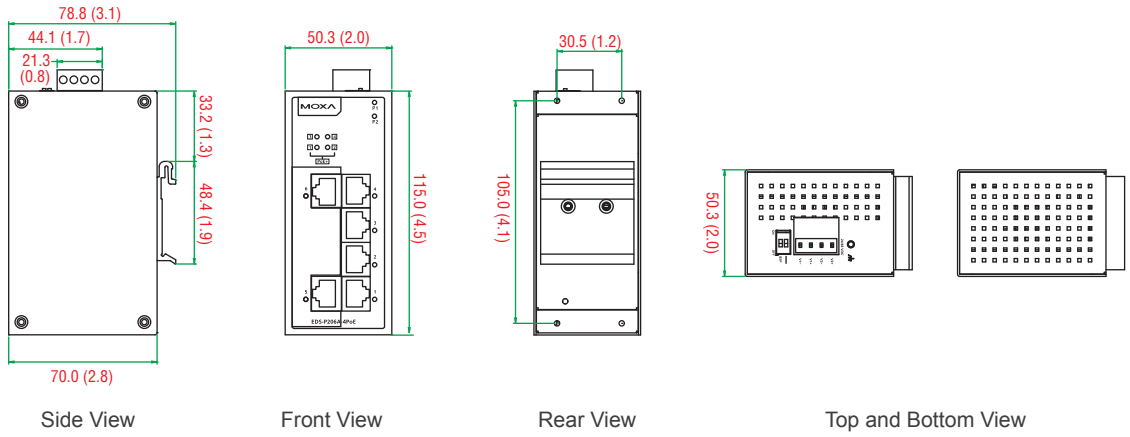
Time: 645,138 hrs
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | Top and Bottom View

Ordering Information

Available Models		Port Interface			
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	100BaseFX		
			Mulit-Mode, SC Connector	Mulit-Mode, ST Connector	Single-Mode, SC Connector
EDS-P206A-4PoE	EDS-P206A-4PoE-T	6	–	–	–
EDS-P206A-4PoE-M-SC	EDS-P206A-4PoE-M-SC-T	5	1	–	–
EDS-P206A-4PoE-M-ST	EDS-P206A-4PoE-M-ST-T	5	–	1	–
EDS-P206A-4PoE-MM-SC	EDS-P206A-4PoE-MM-SC-T	4	2	–	–
EDS-P206A-4PoE-MM-ST	EDS-P206A-4PoE-MM-ST-T	4	–	2	–
EDS-P206A-4PoE-S-SC	EDS-P206A-4PoE-S-SC-T	5	–	–	1
EDS-P206A-4PoE-SS-SC	EDS-P206A-4PoE-SS-SC-T	4	–	–	2

Optional Accessories (can be purchased separately)

DR-75-24/120-24: 75/120 W DIN-rail 24 VDC power supplies
DR-75-48/120-48: 75/120 W DIN-rail 48 VDC power supplies
DRP-240-48: 240 W DIN-rail 48 VDC power supplies
RK-4U: 4U-high 19-inch rack-mounting kit
WK-46: Wall-mounting kit, 2 plates with 8 screws

Package Checklist

- EDS-P206A-4PoE switch
- Protective caps for unused ports
- Hardware installation guide (printed)
- Warranty card

EDS-P308 Series

8-port unmanaged Ethernet switches with 4 IEEE 802.3af PoE ports

- 4 IEEE 802.3af compliant PoE and Ethernet combo ports
- Up to 15.4 watts at 48 VDC per PoE port
- Intelligent power consumption detection and classification
- Redundant dual VDC power inputs
- -40 to 75°C operating temperature range (T models)

Introduction

The EDS-P308 switches are smart, 8-port, unmanaged Ethernet switches supporting PoE (Power-over-Ethernet) on ports 1 to 4. The switches are classified as power source equipment (PSE), and when used in this way, the EDS-P308 switches enable centralization of the power supply and provide up to 15.4 watts of power per port. The switches can be used to power IEEE 802.3af compliant powered devices (PD), eliminating the need for additional wiring, and support IEEE 802.3/802.3u/802.3x with 10/100M, full/half-duplex, MDI/MDI-X auto-sensing to provide an economical solution for your industrial Ethernet network. In addition, the built-in relay warning function alerts network engineers when power failures or port breaks occur.

Specifications

Technology

Standards:
IEEE 802.3af for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control
Processing Type: Store and Forward

Switch Properties

MAC Table Size: 1 K
Packet Buffer Size: 512 kbit

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100BaseFX ports (SC connector)
PoE Pinout: V+, V+, V-, V- for pin 1, 2, 3, 6 (Endspan, MDI Alternative A)
DIP Switches: Port break alarm mask
Alarm Contact: 1 relay output with current carrying capacity of 0.5 A @ 48 VDC

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Power Requirements

Input Voltage: 48 VDC, redundant dual inputs
Operating Voltage: 44 to 57 VDC
Input Current: 1.47 A @ 48 VDC
Overload Current Protection: 2.5 A @ 48 VDC
Connection: 1 removable 6-contact terminal block
Reverse Polarity Protection: Present
Power Consumption: Max. 9.16 W full loading without PDs' consumption
Power Budget: Max. 61.4 W for total PDs' consumption
Max. 15.4 W for each PoE port

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 53.6 × 135 × 105 mm (2.11 x 5.31 x 4.13 in)
Weight: 840 g (1.86 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 1 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Marine: DNV, GL, LR, ABS, NK
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

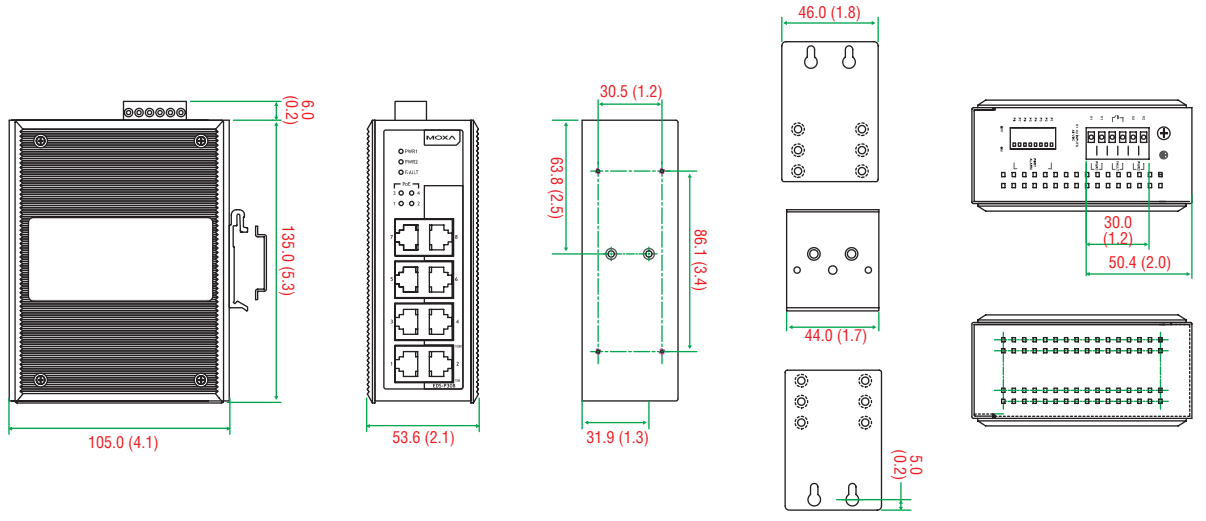
Time: 406,194 hrs
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | DIN-Rail/Panel-Mounting Kit | Top and Bottom View

Ordering Information

Available Models		Port Interface			
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	PoE, 10/100BaseT(X)	100BaseFX	
				Mulit-Mode, SC Connector	Single-Mode, SC Connector
EDS-P308	EDS-P308-T	4	4	–	–
EDS-P308-M-SC	EDS-P308-M-SC-T	3	4	1	–
EDS-P308-S-SC	EDS-P308-S-SC-T	3	4	–	1
EDS-P308-MM-SC	EDS-P308-MM-SC-T	2	4	2	–
EDS-P308-SS-SC	EDS-P308-SS-SC-T	2	4	–	2

Optional Accessories (can be purchased separately)

DR-75-48/120-48: 75/120 W DIN-rail 48 VDC power supplies
DRP-240-48: 240 W DIN-rail 48 VDC power supplies
RK-4U: 4U-high 19-inch rack-mounting kit
WK-46: Wall-mounting kit, 2 plates with 8 screws

Package Checklist

- EDS-P308 switch
- Protective caps for unused ports
- Hardware installation guide (printed)
- Warranty card

INJ-24A Series

Gigabit high power IEEE 802.3af/at PoE+ injectors

- High power mode provides up to 60 W
- DIP switch configurator and LED indicator for PoE management
- 3kV surge resistance for harsh environments
- Mode A and Mode B selectable for flexible installation
- Built-in 24/48 VDC booster for redundant dual power inputs
- -40 to 75°C operating temperature range (T model)

Specifications

Technology

Standards:
IEEE 802.3af/at for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3ab for 1000BaseT(X)

Interface

RJ45 Ports: 10/100/1000BaseT(X) for PoE OUT and DATA IN
PoE Pinout:
Default: V+, V+, V-, V- for pin 4, 5, 7, 8 (Midspan, MDI, Mode B)
Custom DIP switch setting: V+, V+, V-, V- for pin 1, 2, 3, 6 (Endspan, MDI, Mode A)

Power Requirements

Input Voltage: 24/48 VDC, redundant dual inputs
Operating Voltage: 22 to 57 VDC
Input Current: 2.71 A @ 24 VDC
Overload Current Protection: Present
Connection: 1 removable 4-contact terminal block
Reverse Polarity Protection: Present
Power Consumption: Max. 5.29 W full loading without PD's consumption
Power Budget: Max. 60 W for 1 PD's consumption

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 115 × 30.3 × 78.8 mm (4.53 x 1.19 x 3.10 in)
Weight: 245 g (0.54 lb)
Installation: DIN-rail mounting, wall mounting (with WK-30)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508, EN 60950-1 (LVD)
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 3 kV; Signal: 3 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

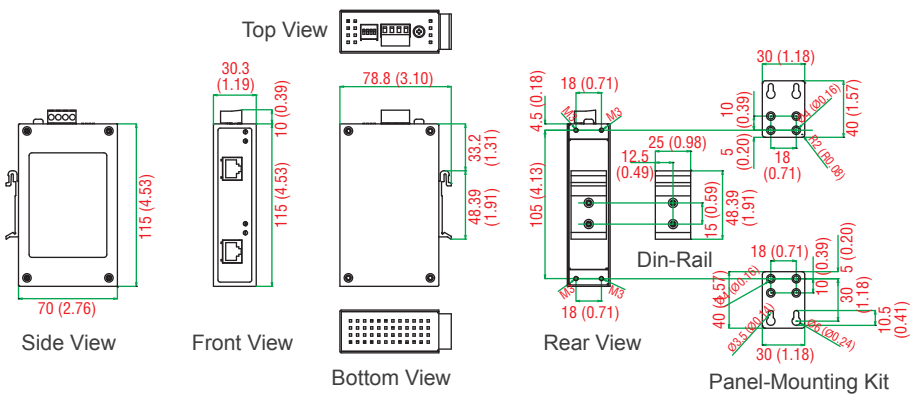
Time: 2,407,739 hrs
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

INJ-24A: Gigabit high-power PoE+ injector, max. output of 60 W at 24/48 VDC, 0 to 60°C operating temperature
INJ-24A-T: Gigabit high power PoE+ injector, max. output of 60 W at 24/48 VDC, -40 to 75°C operating temperature

Note: 60-watt PoE is not a standardized application. Check with Moxa for product compatibility before using 60-watt PoE.

Package Checklist

- INJ-24A high power PoE+ injector
- Hardware installation guide (printed)
- Warranty card

INJ-24 Series

Gigabit IEEE 802.3af/at PoE+ injectors

- PoE+ injector for 10/100/1000M networks; inject power and data to PD (Power Device) equipment
- IEEE 802.3af/at compliant; supports a full 30 watt output
- 24/48 VDC wide range power input
- -40 to 75°C operating temperature range (T model)

Specifications

Technology

Standards:
IEEE 802.3af/at for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3ab for 1000BaseT(X)

Interface

RJ45 Ports: 10/100/1000BaseT(X) for PoE OUT and DATA IN
PoE Pinout: V+, V+, V-, V- for pin 4, 5, 7, 8 (Midspan, MDI Alternative B)

Power Requirements

Input Voltage: 24/48 VDC, single input
Operating Voltage: 22 to 57 VDC
Input Current: 1.42 A @ 24 VDC
Overload Current Protection: Present
Connection: 1 removable 3-contact terminal block
Reverse Polarity Protection: Present
Power Consumption: Max. 4.08 W full loading without PD's consumption
Power Budget: Max. 30 W for 1 PD's consumption

Physical Characteristics

Housing: Plastic
IP Rating: IP30 protection
Dimensions: 24.9 × 100 × 86.2 mm (0.98 x 3.93 x 3.39 in)
Weight: 115 g (0.26 lb)
Installation: DIN-rail mounting

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508, EN 60950-1 (LVD)
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

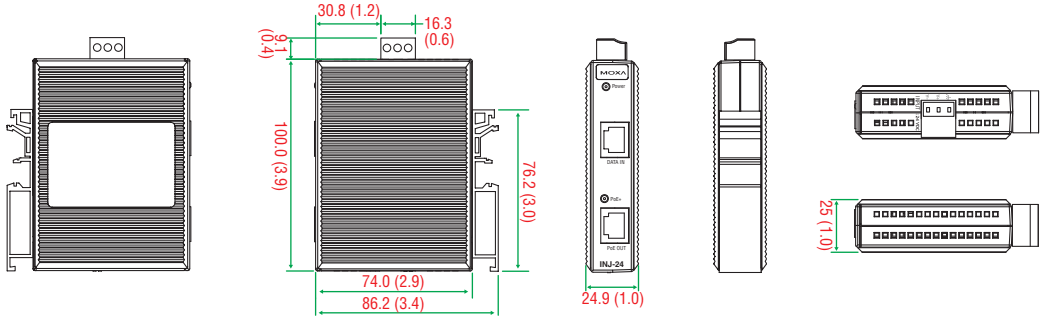
Time: 2,525,278 hrs
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | Top and Bottom View

Ordering Information

Available Models

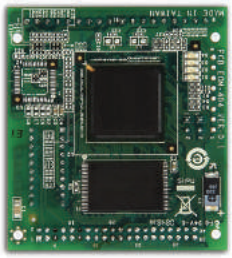
INJ-24: PoE+ Injector, maximum output of 30 W at 24/48 VDC, 0 to 60°C operating temperature
INJ-24-T: PoE+ Injector, maximum output of 30 W at 24/48 VDC, -40 to 75°C operating temperature

Package Checklist

- INJ-24 PoE+ injector
- Hardware installation guide (printed)
- Warranty card

EOM-104 Series

4-port embedded managed Ethernet switch modules



- 10/100BaseT(X) and 100BaseFX Ethernet interfaces
- Turbo Ring and RSTP/STP for Ethernet redundancy
- SNMP and e-mail alerts for event trapping and notification
- Two-thirds the size of a business card
- Low power consumption
- -40 to 75°C operating temperature range

Introduction

The EOM-104 series Ethernet switch modules are designed for device manufacturers who would like to embed Ethernet modules in their products to enhance performance and reliability.

The EOM-104 series modules provide an easy and cost-effective integrated solution for adding an Ethernet switch module to an existing product. The modules support 10/100M Ethernet transmission and come with Turbo Ring's fast recovery time of under 20 ms. The EOM-104 series also provide a rich set of peripherals, such as Turbo Ring Enable and GPIO programming pins, and is an ideal solution for embedded Ethernet applications.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3x for flow control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1p for Class of service

Software Features

MIB: MIB-II, Ethernet-Like MIB, P-Bridge MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Protocols: SNMPv1/v2c/v3, DHCP Client, BootP, TFTP, SMTP, RARP, RMON, HTTP, Telnet, Syslog

Switch Properties

MAC Table Size: 1 K
Packet Buffer Size: 512 kbit

Interface

Ethernet Ports:
EOM-104: 4 10/100BaseT(X) ports
EOM-104-FO: 2 10/100BaseT(X) and 2 100BaseFX ports
Connectors: 1 connector with 2 x 20 pins, 2 connectors with 1 x 9 pins, and 1 connector with 2 x 2 pins
Console Port: RS-232 (TxD, RxD, DTR, DSR)
GPIO: 4 programmable I/O pins

Power Requirements

Input Current: EOM-104: 0.5 A @ 3.3 V
EOM-104-FO: 1.04 A @ 3.3 V

Physical Characteristics

Dimensions: 54 x 60 x 8.25 mm (2.13 x 2.36 x 0.32 in)
Weight: 21 g (0.046 lb)

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

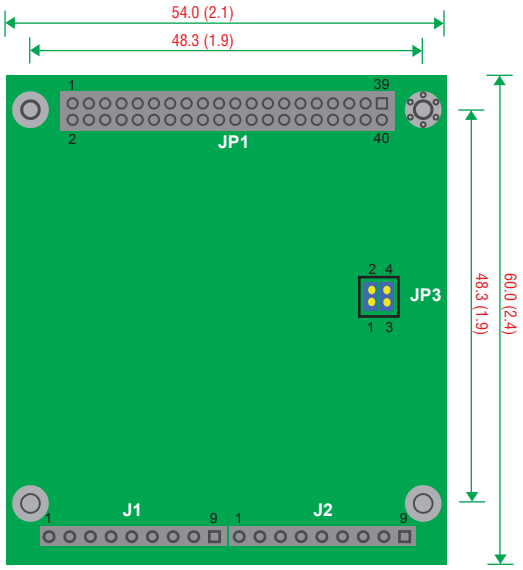
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Pin Assignment

JP1 (2 x 20 connector pin assignment)

PIN	1	3	5	7	9	11	13	15	17	19
SIGNAL	TX2 -	RX2 -	NC	RX1 +	TX1 +	NC	GND	3.3 V	GND	DTR

PIN	2	4	6	8	10	12	14	15	18	20
SIGNAL	TX2 +	RX2 +	NC	RX1 -	TX1 -	NC	GND	3.3 V	GND	DSR

PIN	21	23	25	27	29	31	33	35	37	39
SIGNAL	TXD	GPIO 4	GPIO 2	MASTER ENABLE	MASTER LED	PORT 1 LED	PORT 3 LED	MANUAL RESET	3.3 V	GND

PIN	22	24	26	28	30	32	34	36	38	40
SIGNAL	RXD	GPIO 3	GPIO 1	TURBO RING ENABLE	TURBO RING LED	RESET DEFAULT	PORT 4 LED	PORT 2 LED	3.3 V	GND

J1 (1 x 9 connector pin assignment)

PIN	1	2	3	4	5	6	7	8	9
SIGNAL	GND	TX4 +	TX4 -	3.3 V	3.3 V	FXSD	RX4 -	RX4 +	GND

J2 (1 x 9 connector pin assignment)

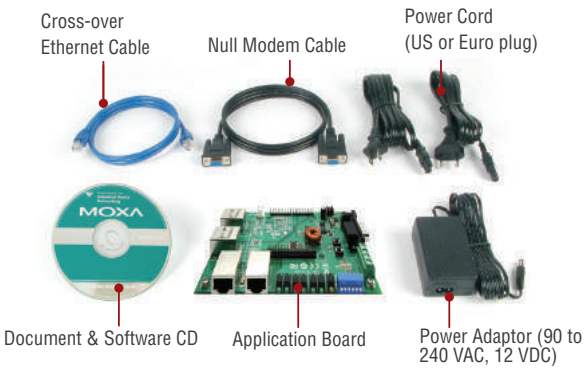
PIN	1	2	3	4	5	6	7	8	9
SIGNAL	GND	TX3 +	TX3 -	3.3 V	3.3 V	FXSD	RX3 -	RX3 +	GND

JP3 (2 x 2 connector pin assignment)

Jumpers 1 and 2 are used to enable the Ring Master
Jumpers 3 and 4 are used to enable Turbo Ring

Evaluation Kits

The EOM Evaluation Kit includes an evaluation board, power adaptor, software CD, and serial and Ethernet cables to allow quick and easy evaluation of all embedded Ethernet switch functions. The evaluation board is equipped with Ethernet ports, console port, and Turbo Ring DIP switch to help you test your modules and applications.



Ordering Information

Available Models

EOM-104: Embedded managed Ethernet switch module with 4 10/100BaseT(X) ports, -40 to 75°C operating temperature
EOM-104-FO: Embedded managed Ethernet switch module with 2 10/100BaseT(X) and 2 100BaseFX ports, -40 to 75°C operating temperature
EOM-104 20PCS: Embedded managed Ethernet switch module with 4 10/100BaseT(X) ports, -40 to 75°C operating temperature, 20 pcs per package
EOM-104-FO 20PCS: Embedded managed Ethernet switch module with 2 10/100BaseT(X) and 2 100BaseFX ports, -40 to 75°C operating temperature, 20 pcs per package

Evaluation Kits (must be purchased separately)

EOM-104 Evaluation Kit: Includes an EOM-104 switch module and evaluation board with 4 10/100BaseT(X) ports for testing and application development
EOM-104-FO Evaluation Kit: Includes an EOM-104-FO switch module and evaluation board with 2 10/100BaseT(X) ports and 2 100BaseFX multi-mode ports (SC connectors) for testing and application development

Evaluation Kit Package Checklist

- EOM-104 module
- EOM-104 evaluation board
- Universal power adaptor
- 2 power cords
- Null modem serial cable
- Cross-over Ethernet cable
- Accessories pack
- Documentation and software CD
- Warranty card

OBU-102 Series

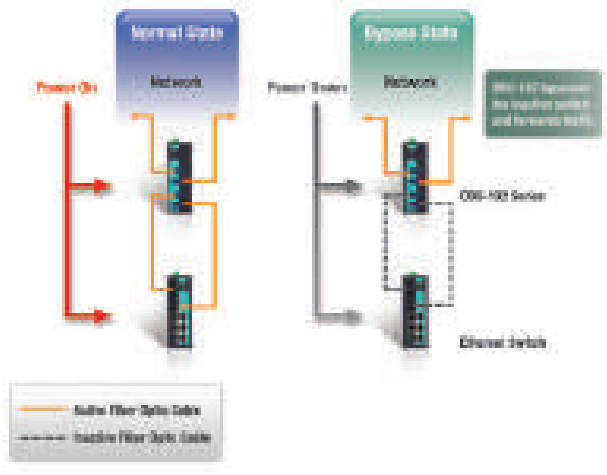
2-channel optical fiber bypass units

- Supports Fast, Gigabit, and 10 Gigabit Ethernet fiber connections in SC/ST/LC connectors
- Redundant dual 12/24/48 VDC power inputs
- IP30 metal housing
- -20 to 70°C operating temperature range
- DIN-rail mounting ability
- Ultra low power consumption 0.72 W

Introduction

Moxa's OBU-102 fiber optical bypass units add bypass relay functionality to any network node. In linear topologies, a single power outage or node failure can take out an entire chunk of the network, because communications to all the network nodes further down the line are also cut. With relay bypass, that node is instead simply bypassed in the event of a failure, and the rest of the network is unaffected.

The OBU-102 sits between a node and the network to add bypass relay functionality to any network switches that do not already support this important function. In normal operations, the OBU-102 simply acts as a gateway that forwards network traffic to and from the network switch. However, if power is lost, the OBU-102 will bypass the unpowered switch and simply pass network traffic to the next switch in the relay.



Specifications

Bypass Properties
Optical Switching Time: Max. 10 ms
Insertion Loss: Max. 1.6 dB

Interface
Fiber Ports: 100M/1G/10G fiber in SC/ST/LC connector, single mode
Rotary Switch: configure boot delay interval

Power Requirements
Input Voltage: 12/24/48 VDC, redundant dual inputs
Operating Voltage: 9.6 to 60 VDC
Overload Current Protection: 1100 mA @ 48 VDC
Connection: 2 removable 2-contact terminal block
Reverse Polarity Protection: Present

Physical Characteristics
Housing: Metal
IP Rating: IP30 protection
Dimensions: 53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)
Weight: 700 g (1.55 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

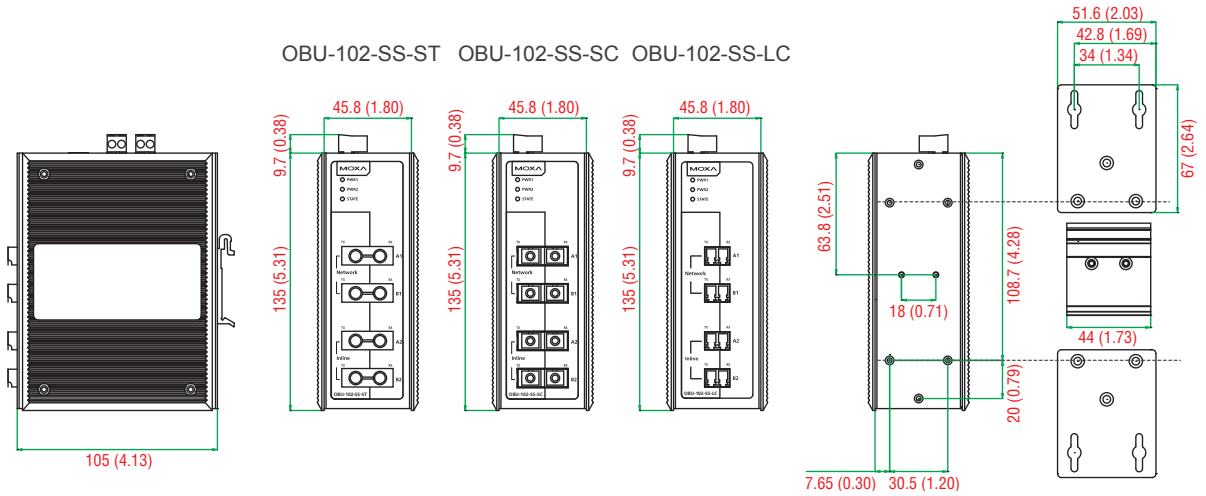
Environmental Limits
Operating Temperature: -20 to 70°C (-4 to 158°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
Safety: UL 508
EMC: EN 55022 Class A
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 0.5 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty
Warranty Period: 2 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | DIN-Rail/ Panel-Mounting Kit

Ordering Information

Available Models (-20 to 75°C)	Port Interface		
	Single-Mode, SC Connector	Single-Mode, ST Connector	Single-Mode, LC Connector
OBU-102-SS-SC	4	–	–
OBU-102-SS-ST	–	4	–
OBU-102-SS-LC	–	–	4

Optional Accessories (can be purchased separately)

DR-4524/75-24/120-24: 45/75/120 W DIN-rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-rail 24 VDC power supplies, -20 to 70°C operating temperature
RK-4U: 4U-high 19-inch rack-mounting kit
WK-30: Wall-mounting kit, 2 plates with 4 screws
WK-46: Wall-mounting kit, 2 plates with 8 screws

Package Checklist

- OBU-102 unit
- Hardware installation guide (printed)
- Warranty card

SFP-10G Series

1-port 10 Gigabit Ethernet SFP+ modules

- Digital Diagnostic Monitor Function
- Compliant with IEEE 802.3ae
- SFF-8432 SFP+ MSA compliant
- Hot pluggable LC duplex connector
- Class 1 Laser International Safety Standard IEC 825 compliant
- RoHS compliant

Specifications

Interface

Connectors: Duplex LC Connector
10G Ethernet Ports: 1

Optical Fiber

		10G Ethernet SFP			
		SFP-SR		SFP-LR	SFP-ER
Transceiver Type		Multi-Mode		Single-Mode	Single-Mode
Fiber Cable Type		OM1	OM3	G.652	G.652
Typical Distance		33 m	300 m	10 km	40 km
Wave-length	Typical (nm)	850		1310	1550
	TX Range (nm)	840 to 860		1260 to 1355	1530 to 1565
	RX Range (nm)	840 to 860		1260 to 1600	1260 to 1600
Optical Power	Link Budget (dB)	1.6	2.6	6.2	10.9

Note: When connecting the SFP-ER, we recommend using an attenuator to prevent damaged caused by excessive optical power.

Power Requirements

Power Consumption: Max. 1.5 W

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 176°F)
Note: When the SFP-10GERLC is used with ICS-G7750A/G7752A/G7850A/G7852A series, operating temperature is 0 to 55°C (32 to 131°F).
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

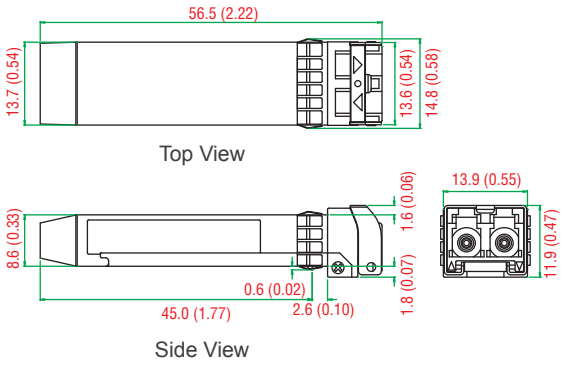
Safety: CE, FCC, TÜV, UL 60950-1

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

SFP-10GSRLC: SFP+ module with 1 10GBase-SR port for 33 m transmission, LC connector, 0 to 60°C operating temperature
SFP-10GLRLC: SFP+ module with 1 10GBase-LR port for 10 km transmission, LC connector, 0 to 60°C operating temperature
SFP-10GERLC: SFP+ module with 1 10GBase-ER port for 40 km transmission, LC connector, 0 to 60°C operating temperature
Please refer to the Moxa Ethernet SFP Transceiver Products Compatibility Matrix on the next page for available models.

Package Checklist

- SFP-10G module
- Warranty card

SFP-1G Series

1-port Gigabit Ethernet SFP modules

- Digital Diagnostic Monitor Function
- -40 to 85°C operating temperature range (T models)
- IEEE 802.3z compliant
- Differential LVPECL inputs and outputs
- TTL signal detect indicator
- Hot pluggable LC duplex connector
- Class 1 laser product, complies with EN 60825-1

Specifications

Interface

Ethernet Ports: 1

Connectors: Duplex LC Connector or Simplex LC Connector (WDM-type only)

Optical Fiber

		Gigabit Ethernet SFP								
		SFP-SX		SFP-LSX		SFP-LX	SFP-LH	SFP-LHX	SFP-ZX	SFP-EZX	SFP-EZX-120
Transceiver Type		Multi-Mode		Multi-Mode		Single-Mode	Single-Mode	Single-Mode	Single-Mode	Single-Mode	Single-Mode
Fiber Cable Type		OM1	OM2	OM2	OM1	G.652	G.652	G.652	G.652	G.652	G.652
Typical Distance		300 m	550 m	1 km	2 km	10 km	30 km	40 km	80 km	110 km	120 km
Wave-length	Typical (nm)	850		1310		1310	1310	1310	1550	1550	1550
	TX Range (nm)	830 to 860		1270 to 1355		1280 to 1355	1280 to 1355	1280 to 1340	1530 to 1570	1530 to 1570	1530 to 1570
	RX Range (nm)	770 to 860		1260 to 1610		1260 to 1610	1260 to 1610	1260 to 1610	1260 to 1610	1260 to 1610	1100 to 1600
Optical Power	TX Range (dBm)	-4 to -9.5		-1 to -9		-3 to -9	-3 to -8	+3 to -4	+5 to 0	+5 to 0	+3 to -2
	RX Range (dBm)	0 to -18		-1 to -19		-3 to -21	-3 to -23	-1 to -24	-1 to -24	-9 to -30	-8 to -33
	Link Budget (dB)	8.5		10		12	15	20	24	30	31
	Dispersion Penalty (dB)	4.3	3.6	5	5	1	1	1	1	1	2

Note: When connecting the SFP-LHX, ZX, EZX, or EZX-120, we recommened using an attenuator to prevent the transceiver from being damaged by excessive optical power.

		WDM Gigabit Ethernet SFP					
		SFP-10A	SFP-10B	SFP-20A	SFP-20B	SFP-40A	SFP-40B
Transceiver Type		Single-Mode		Single-Mode		Single-Mode	
Fiber Cable Type		G.652		G.652		G.652	
Typical Distance		10 km		20 km		40 km	
Wave-length	Typical (nm)	TX 1310, RX 1550	TX 1550, RX 1310	TX 1310, RX 1550	TX 1550, RX 1310	TX 1310, RX 1550	TX 1550, RX 1310
	TX Range (nm)	1270 to 1355	1530 to 1570	1270 to 1355	1530 to 1570	1290 to 1330	1530 to 1570
	RX Range (nm)	1480 to 1580	1260 to 1360	1480 to 1580	1260 to 1360	1480 to 1580	1260 to 1360
Optical Power	TX Range (dBm)	-3 to -9		-2 to -8		+2 to -3	
	RX Range (dBm)	-3 to -21		-2 to -23		-1 to -23	
	Link Budget (dB)	12		15		20	
	Dispersion Penalty (dB)	2		3		1	

Note: WDM-type SFP modules must be used in pairs (e.g., SFP-1G10ALC and SFP-1G10BLC)
Note: When connecting the SFP-40A and 40B, we recommend using an attenuator to prevent damage caused by excessive optical power.

Typical Distance: To reach the typical distance of specified fiber transceiver, please refer to formula: Link budget(dB) > dispersion penalty(dB) + total link loss(dB).

Power Requirements

Power Consumption: Max. 1 W

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: CE, FCC, TÜV, UL 60950-1
Marine: DNV, GL

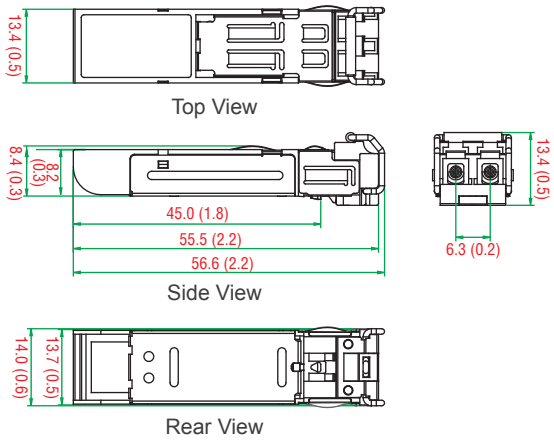
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

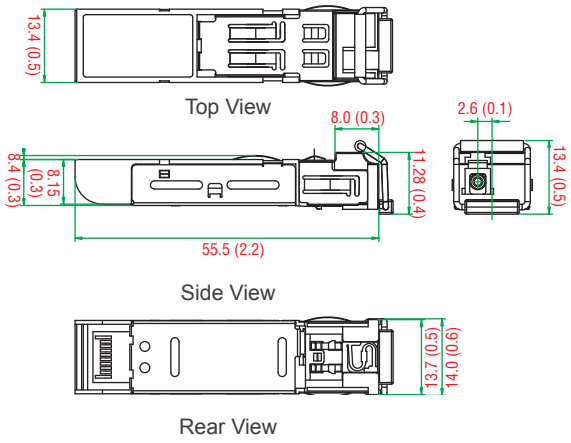
Dimensions

Unit: mm (inch)

SFP-1G Series



SFP-1G Series (WDM Type)



Ordering Information

Gigabit Ethernet SFP Models				WDM Gigabit Ethernet SFP Models			
Standard Temperature Models (0 to 60°C)	Wide Temperature Models (-40 to 85°C)	Transceiver Type	Typical Distance	Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 85°C)	Transceiver Type	Typical Distance
SFP-1GSXLC	SFP-1GSXLC-T*	Multi-Mode	300/550 m	SFP-1G10ALC	SFP-1G10ALC-T	Single-Mode	10 Km
SFP-1GLSXLC	SFP-1GLSXLC-T	Multi-Mode	1/2 Km	SFP-1G10BLC	SFP-1G10BLC-T	Single-Mode	10 Km
SFP-1GLXLC	SFP-1GLXLC-T	Single-Mode	10 Km	SFP-1G20ALC	SFP-1G20ALC-T	Single-Mode	20 Km
SFP-1GLHLC	SFP-1GLHLC-T	Single-Mode	30 Km	SFP-1G20BLC	SFP-1G20BLC-T	Single-Mode	20 Km
SFP-1GLHXLC	SFP-1GLHXLC-T	Single-Mode	40 Km	SFP-1G40ALC	SFP-1G40ALC-T	Single-Mode	40 Km
SFP-1GZXLC	SFP-1GZXLC-T	Single-Mode	80 Km	SFP-1G40BLC	SFP-1G40BLC-T	Single-Mode	40 Km
SFP-1GEZXLC	–	Single-Mode	110 Km	–	–	–	–
SFP-1GEZXLC-120	–	Single-Mode	120 Km	–	–	–	–

*SFP-1GSXLC-T: -20 to 75°C operating temperature

Available Models

Please refer to the Moxa Ethernet SFP Transceiver Products Compatibility Matrix on the next page for available models.

Package Checklist

- SFP-1G module
- Warranty card

SFP-1G Copper Series

1-port Gigabit Ethernet copper SFP modules

- Compliant with IEEE 802.3,2002
- Fixed 1000 BASE-T speed
- Hot pluggable RJ45 connector
- TTL signal detection (RX los)
- RoHS compliant and lead free

Specifications

Interface

Connectors: RJ45
The port can not be used for Turbo Ring v1, Turbo Ring v2, and Turbo Chain.
Gigabit Ethernet Ports: 1

Power Requirements

Power Consumption: Max. 1.2 W

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

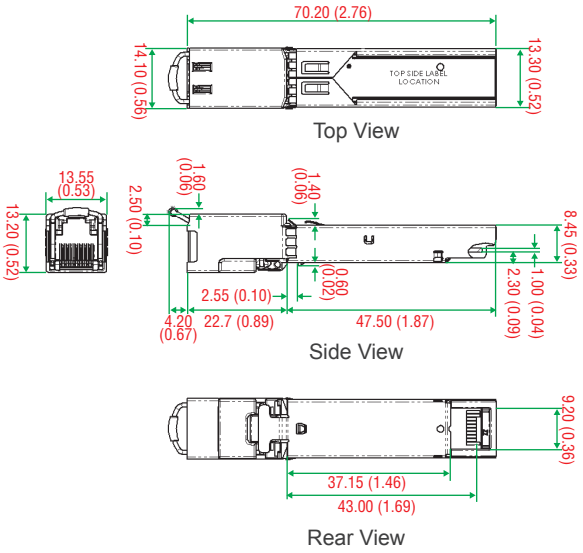
Safety: CE, FCC, TÜV, UL 60950-1
Marine: DNV, GL

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

SFP-1GTXRJ45-T: SFP module with fixed 1000BaseT port, RJ45 connector, -40 to 75°C operating temperature
Please refer to the Moxa Ethernet SFP Transceiver Products Compatibility Matrix on the next page for available models.

Package Checklist

- SFP-1G copper module
- Warranty card

SFP-1FE Series

1-port Fast Ethernet SFP modules

- Digital Diagnostic Monitor Function
- IEEE 802.3u compliant
- Differential PECL inputs and outputs
- TTL signal detect indicator
- Hot pluggable LC duplex connector
- Class 1 laser product; complies with EN 60825-1

Specifications

Interface

Ethernet Ports: 1
Connectors: Duplex LC Connector

Optical Fiber

		Fast Ethernet SFP			
		SFP-M		SFP-S	SFP-L
Transceiver Type		Multi-Mode		Single-Mode	Single-Mode
Fiber Cable Type		OM1/OM2	62.5/125, 50/125 µm 800 MHz*Km	G.652	G.652
Typical Distance		2 km	4 km	40 km	80 km
Wave-length	Typical (nm)	1310		1310	1550
	TX Range (nm)	1280 to 1340		1280 to 1340	1530 to 1570
	RX Range (nm)	1100 to 1650		1100 to 1600	1100 to 1600
Optical Power	TX Range (dBm)	-8 to -18		0 to -5	0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34	-3 to -34
	Link Budget (dB)	14		29	29
	Dispersion Penalty (dB)	2	3	1	1

Note: When connecting the SFP-S or L, we recommend using an attenuator to prevent damage caused by excessive optical power.

Power Requirements

Power Consumption: Max. 1 W

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

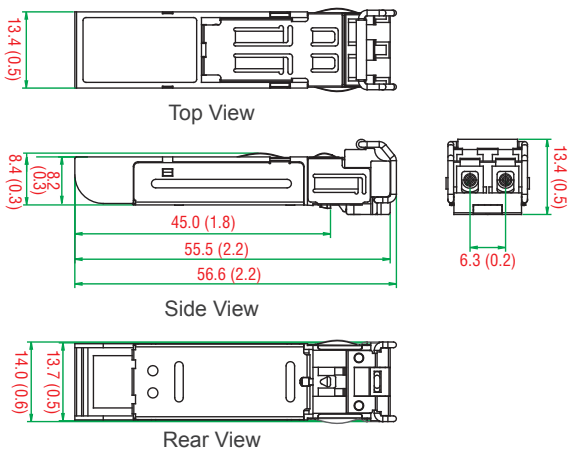
Safety: CE, FCC, TÜV, UL 60950-1
Marine: DNV, GL

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models	Port Interface		
Wide Temperature (-40 to 85°C)	100BaseFX, Multi-Mode, LC Connector, 4 km	100BaseFX, Single-Mode, LC Connector, 40 km	100BaseFX, Single-Mode, LC Connector, 80 km
SFP-1FEMLC-T	1	–	–
SFP-1FESLC-T	–	1	–
SFP-1FELLC-T	–	–	1

Available Models

Please refer to the Moxa Ethernet SFP Transceiver Products Compatibility Matrix on the next page for available models.

Package Checklist

- SFP-1FE module
- Warranty card

Moxa Ethernet SFP Transceiver Product Compatibility Matrix

Refer to the product compatibility matrix below to determine which SFP modules are compatible with which product models. For more specification information about an SFP module, please refer to the module's datasheet.

Model	SFP-1FE Series	SFP-1G Series	SFP-1G Copper Series	SFP-10G Series
Industrial 10Gb Core Switches				
ICS-G7850A/G7852A Series	–	✓	✓	✓
ICS-G7750A/G7752A Series	–	✓	✓	✓
ICS-G7826A/G7828A Series	✓	✓	✓	✓
ICS-G7526A/G7528A Series	✓	✓	✓	✓
IM-G7000A-4GSFP	✓	✓	✓	–
Rackmount Ethernet Switches				
IKS-G6524A/G6824A Series	✓	✓	✓	–
IKS-6726A/6728A Series	✓	✓	–	–
IKS-6728A-8PoE Series	✓	✓	–	–
IM-6700A-8SFP	✓	–	–	–
DIN-Rail Etherne Switches				
EDS-611/619 Series	✓	✓	–	–
EDS-G516E Series	✓	✓	✓	–
EDS-G512E Series	✓	✓	✓	–
EDS-G509 Series	✓	✓	–	–
EDS-518E Series	✓	✓	–	–
EDS-510E Series	✓	✓	–	–
EDS-518A Series	–	✓	–	–
EDS-510A Series	–	✓	–	–
EDS-G308-2SFP Series	✓	✓	✓	–
EDS-G205-1GTXSFP Series	✓	✓	–	–
EDS-210A Series	–	✓	✓	–
IM-2GSFP	–	✓	–	–
Industrial Secure Router				
EDR-G903/G902 Series	✓	✓	–	–
EDR-810 Series	–	✓	✓	–
Industrial PoE Switches				
EDS-G512E-8PoE Series	✓	✓	✓	–
EDS-P510A-8PoE Series	✓	✓	–	–
EDS-P510 Series	✓	✓	–	–
EDS-G205A-4PoE Series	✓	✓	–	–
IEC61850-3 Ethernet Switches				
PT-G7509 Series	✓	✓	–	–
PT-7528 FX Series	–	✓	✓	–
PM-7500-2G/4GTXSFP	✓	✓	–	–
PM-7200-2G/4GTXSFP		✓	–	–
PM-7200-8SFP Series	✓	–	–	–
Industrial Media Converter				
IMC-21GA	–	✓	–	–
IMC-101G Series	–	✓	–	–

Note: For 10Gb core switches, the 10G SFP port slot can only support a 10G SFP transceiver.

ABC Series

Configuration backup and restoration tool for managed switches and wireless APs/Bridges/Clients

- Plug-n-Play system configuration backup and restoration
- Rugged, reliable design
- 1-click backup and auto-load technology to reduce system downtime (ABC-02 only)
- Powerful troubleshooting tool to record mass event logs (ABC-02 only)
- Supports Moxa's managed Ethernet switches and wireless APs/bridges/clients

Features

- ABC-01 series with RS-232 RJ45/M12 console port connection
- ABC-02 series can easily accessible as an USB 2.0 (type A) storage device using Windows OS
- Backup and restore switch configuration files
- Load the system configuration automatically after system reboot

ABC-02 Features

- One-click backup of system configurations using the RESET button
- Extend recorded entries of event logs
- Auto-backup of switch configuration files when any setting is changed

Introduction

The ABC series is designed for system backup and restoration to enhance maintenance efficiency and reduce system downtime.
The ABC-01 /ABC-01-M12 Automatic Backup Configurator tool can be used to save and load the configuration of Moxa's managed Ethernet switches and AWK series wireless APs/bridges/clients through the RS-232 console port.

The ABC-02-USB Automatic Backup Configurator is designed for Moxa's new generation of managed switches. It can save and load configuration files, back up event logs, and load firmware via the USB (universal serial bus) interface on the switches.
The ABC series makes it easier to manage the backup of system parameters and perform configuration. With the ABC series, users can quickly configure a replacement switch (of the same model).

Specifications

Interface

Connectors:
• ABC-01 Series: RS-232/RJ45/M12 port
• ABC-02 Series: USB 2.0 Type A

Basic Operation

Storage Capacity:
• ABC-01 Series: 128 KB Flash
• ABC-02 Series: 128 MB SLC type NAND Flash

Power Requirements

Input Voltage:
• ABC-01 Series: 3 to 5 VDC (through the RS-232 port's RTS signal)
• ABC-02 Series: 5 VDC (through USB Interface)

Physical Characteristics

Housing: PVC molding
IP Rating: IP40 protection
Dimensions: 32.5 x 97 x 12 mm (1.28 x 3.82 x 0.47 in)
Weight:
• ABC-01 and ABC-02-USB: 50 g (0.11 lb)
• nABC-01-M12: 60 g (0.14 lb)
Mounting Method: M4 screws (< 4 mm)
Cable Length: 35±3 cm (including connector)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: Standard Models: -20 to 70°C (-4 to 158°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95 % (non-condensing)

Standards and Certifications

EMC: EN 55022 Class A
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models

ABC-01: Configuration backup and restoration tool for managed Ethernet switches and AWK series wireless APs/Bridges/Clients, 0 to 60°C operating temperature
ABC-01-M12: Configuration backup and restoration tool with M12 connector for ToughNet series EN 50155 managed Ethernet switches, 0 to 60°C operating temperature
ABC-02-USB: USB-based auto backup configurator, configuration backup/restoration, firmware upgrade and log file storage tool for managed Ethernet switches and routers, 0 to 60°C operating temperature
ABC-02-USB-T: USB-based auto backup configurator, configuration backup/restoration, firmware upgrade and log file storage tool for managed Ethernet switches and routers, -40 to 75°C operating temperature

Package Checklist

- ABC-01 or ABC-02 configuration backup tool
- Hardware installation guide (printed)
- Warranty card

Industry-Specific Ethernet Switches

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EN 50155 Ethernet Switches

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TN-5816A/5818A Series: 16/16+2G-port L3 managed Ethernet switches 2-9
TN-5524-8PoE Series: 24-port managed Ethernet switches with 8 PoE ports 2-12
TN-5510A/5518A Series: 8+2G/16+2G-port Gigabit Ethernet switches with up to 8 PoE ports 2-15
TN-5510A-2GLSX-ODC Series: 8+2G-port Q-ODC® managed Ethernet switches with up to 8 PoE ports 2-19
TN-5508A/5516A Series: 8/16-port managed Ethernet switches with up to 8 PoE ports 2-22
TN-5308 Series: 8-port unmanaged Ethernet switches 2-26
TN-5308-4/8PoE Series: 8-port unmanaged switches with 4/8 PoE ports 2-28
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IEC 61850-3 Ethernet Switches

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PT-7728-PTP Series: IEC 61850-3 Layer 2 IEEE 1588v2 PTP rackmount (PRP/HSR) Ethernet switches 2-40
PT-7528 Series: IEC 61850-3 28-port Layer 2 managed rackmount Ethernet switches 2-44
PT-7728 Series: IEC 61850-3 24+4G-port managed rackmount Ethernet switches 2-48
PT-G7509 Series: IEC 61850-3 9G-port full Gigabit managed rackmount Ethernet switches 2-51
PT-7710 Series: IEC 61850-3 8+2G-port managed rackmount Ethernet switches 2-54
PM-7200/7500 Series: Gigabit and Fast Ethernet modules for PT and IKS series switches 2-57
PT-508/510 Series: IEC 61850-3 8/10-port Gigabit managed Ethernet switches 2-60
PT-G503-PHR-PTP Series: IEC 61850-3/62439-3 3-port full Gigabit managed redundancy boxes 2-63
EOM-G103-PHR-PTP Series: IEC 62439-3 3-port full Gigabit embedded managed redundancy modules 2-66

2

Industry-Specific Ethernet Switches

EN 50155 Ethernet Switches

	NAT Router	L3 Managed Switches	L2 Managed Ethernet Switches				
	Fast Ethernet Series	Gigabit and Fast Ethernet Series	Power-over-Ethernet Series	Gigabit Ethernet Series	Gigabit Ethernet and Power-over-Ethernet Series	Fast Ethernet Series	Power-over-Ethernet Series
	TN-5916 Series	TN-5816ABP/5818A Series	TN-5524-8PoE Series	TN-5510A/5518A Series	TN-5510A/5518A-8PoE Series	TN-5508A/5516A Series	TN-5508A/5516A-8PoE Series
Number of Ports							
Max. Number of Ports	16	16/18	24	10/18	10/18	8/16	8/16
Gigabit Ethernet, 10/100/1000 Mbps	–	2 (TN-5818A)	–	2	2	–	–
Gigabit Fiber Ethernet, 1000 Mbps	–	–	–	–	–	–	–
Fast Ethernet, 10/100 Mbps	16	16	24 (8 PoE)	8/16	8 (8 PoE) / 16 (8 PoE)	8/16	8 (8 PoE) / 16 (8 PoE)
Power Supply							
24 to 110 VDC	✓	✓	–	✓	✓	✓	✓
12/24/36/48 VDC	–	–	–	–	–	–	–
72/96/110 VDC	–	–	–	–	–	–	–
80 to 300 VDC 85 to 264 VAC	–	–	–	–	–	–	–
24 VDC	–	–	✓	–	–	–	–
48 VDC	–	–	–	–	–	–	–
24 VAC	–	–	–	–	–	–	–
Installation Options							
DIN-Rail Mounting	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit
Panel Mounting	✓	✓	✓	✓	✓	✓	✓
Operating Temperature							
-25 to 60°C (-13 to 140°F)	–	–	–	–	–	–	–
-40 to 75°C (-40 to 167°F)	✓	✓	✓	✓	✓	✓	✓
Redundancy and Backup Options							
Turbo Ring (Recovery Time < 20 ms)	✓	✓	✓	✓	✓	✓	✓
Turbo Chain (Recovery Time < 20 ms)	–	✓	✓	✓	✓	✓	✓
Turbo Ring v2 with Dynamic Ring Coupling	–	✓	–	✓	✓	✓	✓
STP/RSTP/MSTP	STP/RSTP	✓	✓	✓	✓	✓	✓
Bypass Relay	✓	✓	–	✓	✓	–	–
Network Management and Control							
IPv6	–	–	✓	✓	✓	✓	✓
DHCP Option 66/67/82	✓	✓	✓	✓	✓	✓	✓
LLDP	✓	✓	✓	✓	✓	✓	✓
Modbus/TCP	–	✓	✓	✓	✓	✓	✓
IGMP/GMRP	IGMP v1/v2	✓	✓	✓	✓	✓	✓
Port Trunking	✓	✓	✓	✓	✓	✓	✓
IEEE 802.1X	–	✓	✓	✓	✓	✓	✓
Port Lock	–	✓	✓	✓	✓	✓	✓
SNMP/RMON	SNMP	✓	✓	✓	✓	✓	✓
VLAN	✓	✓	✓	✓	✓	✓	✓
QoS	✓	✓	✓	✓	✓	✓	✓
Relay Warning	✓	✓	✓	✓	✓	✓	✓
Standards and Certifications							
CE/FCC	✓	✓	✓	✓	✓	✓	✓
UL 508	✓	✓	✓	✓	✓	✓	✓
Railway Applications: EN 50155 EN 50121-4	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓
Page	2-7	2-9	2-12	2-15	2-15	2-22	2-22

EN 50155 Ethernet Switches

	L2 Managed Ethernet Switches		Unmanaged Ethernet Switches		
	Gigabit Fiber Ethernet Series	Gigabit Fiber and Power-over-Ethernet Series	Fast Ethernet Series		Power-over-Ethernet Series
	TN-5510A-2GLSX-ODC Series	TN-5510A-8PoE-2GLSX-ODC Series	TN-5308 Series	TN-5305 Series	TN-5308-4PoE/8PoE Series
Number of Ports					
Max. Number of Ports	8	8	8	5	8
Gigabit Ethernet, 10/100/1000 Mbps	–	–	–	–	–
Gigabit Fiber Ethernet, 1000 Mbps	2	2	–	–	–
Fast Ethernet, 10/100 Mbps	8	8 (8 PoE)	8	5	8 (4 PoE) / 8 (8 PoE)
Power Supply					
24 to 110 VDC	✓	✓	–	–	–
12/24/36/48 VDC	–	–	✓	–	–
72/96/110 VDC	–	–	✓	–	–
80 to 300 VDC 85 to 264 VAC	–	–	–	–	–
24 VDC	–	–	–	✓	–
48 VDC	–	–	–	–	✓
24 VAC	–	–	–	✓	–
Installation Options					
Din-Rail Mounting	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit
Panel Mounting	✓	✓	✓	✓	✓
Operating Temperature					
-25 to 60°C (-13 to 140°F)	–	–	✓	✓	✓
-40 to 75°C (-40 to 167°F)	✓	✓	✓	✓	✓
Redundancy and Backup Options					
Turbo Ring (Recovery Time < 20 ms)	✓	✓	–	–	–
Turbo Chain (Recovery Time < 20 ms)	✓	✓	–	–	–
Turbo Ring v2 with Dynamic Ring Coupling	✓	✓	–	–	–
STP/RSTP/MSTP	✓	✓	–	–	–
Bypass Relay	–	–	–	–	–
Network Management and Control					
IPv6	✓	✓	–	–	–
DHCP Option 66/67/82	✓	✓	–	–	–
LLDP	✓	✓	–	–	–
Modbus/TCP	✓	✓	–	–	–
IGMP/GMRP	✓	✓	–	–	–
Port Trunking	✓	✓	–	–	–
IEEE 802.1X	✓	✓	–	–	–
Port Lock	✓	✓	–	–	–
SNMP/RMON	✓	✓	–	–	–
VLAN	✓	✓	–	–	–
QoS	✓	✓	–	–	–
Relay Warning	✓	✓	–	–	–
Standards and Certifications					
CE/FCC	✓	✓	✓	✓	✓
UL 508	✓	✓	✓	✓	✓
Railway Applications: EN 50155, EN 50121-4	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓
Page	2-19	2-19	2-26	2-30	2-28

IEC 61850-3 Ethernet Switches

	Managed Ethernet Switches							
	PT-7728-PTP	PT-7828	PT-7728	PT-7528	PT-7710	PT-G7509	PT-508/510	PT-G503-PHR-PTP
Number of Ports								
Max. Number of Ports	28	28	28	28	10	9	8/10	3
Max. Number of Hardware PTP Ports	14	–	–	–	–	–	–	3
Gigabit Ethernet, 10/100/1000 Mbps	Up to 4	Up to 4	Up to 4	Up to 4	Up to 2	9	–	3
Fast Ethernet, 10/100 Mbps	Up to 28	Up to 28	Up to 28	Up to 28	Up to 10	9	8/10	3
Power Supply								
24 VDC, isolated	✓	✓	✓	–	–	✓	✓	–
48 VDC, isolated	✓	✓	✓	–	–	✓	✓	–
12/24/48 VDC	–	–	–	–	✓	–	–	–
24/48 VDC, isolated	–	–	–	✓	–	–	–	✓
88 to 300 VDC or 85 to 264 VAC, isolated	✓	✓	✓	✓	✓	✓	✓	✓
Installation Options								
Rack Mounting	✓	✓	✓	✓	✓	✓	–	–
Panel Mounting	–	–	–	–	✓	–	w/ optional kit	w/ optional kit
DIN-Rail Mounting	–	–	–	–	–	–	✓	✓
Operating Temperature								
-40 to 85°C (-40 to 185°F)	✓	✓	✓	✓	✓	✓	✓	✓
Redundancy and Backup Options								
PRP/HSR (Recovery Time ≈ 0 ms)	✓	–	–	–	–	–	–	✓
Turbo Ring/Turbo Chain (Recovery Time < 20 ms)	✓	✓	✓	✓	✓	–	✓	–
Turbo Ring/Turbo Chain (Recovery Time < 50 ms)	–	–	–	–	–	✓	–	–
STP/RSTP	✓	✓	✓	✓	✓	✓	✓	–
Automatic Backup Configurator (ABC-01)	✓	✓	✓	–	✓	✓	✓	–
Automatic Backup Configurator (ABC-02)	–	–	–	✓	–	–	–	✓
Ethernet console port	–	–	–	–	–	–	–	✓
Network Management and Control								
Layer 3 Switching	–	✓	–	–	–	–	–	–
IPv6	✓	–	✓	✓	✓	✓	✓	–
DHCP Option 66/67/82	✓	✓	✓	✓	✓	✓	✓	–
NTP/SNTP	✓	✓	✓	✓	✓	✓	✓	✓
Software-based IEEE 1588v2 PTP	✓	✓	✓	✓	✓	✓	✓	–
Hardware-based IEEE 1588v2 PTP	✓	–	–	–	–	–	–	✓
LLDP	✓	✓	✓	✓	✓	✓	✓	✓
Modbus TCP	✓	✓	✓	✓	✓	✓	✓	–
EtherNet/IP	✓	✓	✓	✓	✓	✓	✓	–
IGMP/GMRP	✓	✓	✓	✓	✓	✓	✓	–
Port Trunking	✓	✓	✓	✓	✓	✓	✓	–
IEEE 802.1X	✓	✓	✓	✓	✓	✓	✓	–
Port Lock	✓	✓	✓	✓	✓	✓	✓	–
TACACS+/RADIUS	✓	✓	✓	✓	✓	✓	✓	Later release
Port Mirror	✓	✓	✓	✓	✓	✓	✓	by Ethernet console port
SNMP/RMON	✓	✓	✓	✓	✓	✓	✓	✓
VLAN	✓	✓	✓	✓	✓	✓	✓	–
QoS	✓	✓	✓	✓	✓	✓	✓	–
Relay Warning	✓	✓	✓	✓	✓	✓	✓	✓
Standards and Certifications								
CE/FCC	✓	✓	✓	✓	✓	✓	✓	✓
UL/cUL 60950-1	✓	✓	✓	✓	✓	✓	–	–
UL 508	–	–	–	✓	–	–	✓	✓
IEC 61850-3 (Power Substation)	✓	✓	✓	✓	✓	✓	✓	✓
IEEE 1613 (Power Substation)	✓	✓	✓	✓	✓	✓	✓	✓
50121-4 (Way-side Applications)	–	✓	✓	✓	✓	–	–	✓
EN 50155 (Railway Applications)	–	✓	✓	–	✓	–	–	–
NEMA TS2 (Traffic Control System)	–	✓	✓	✓	✓	–	–	–
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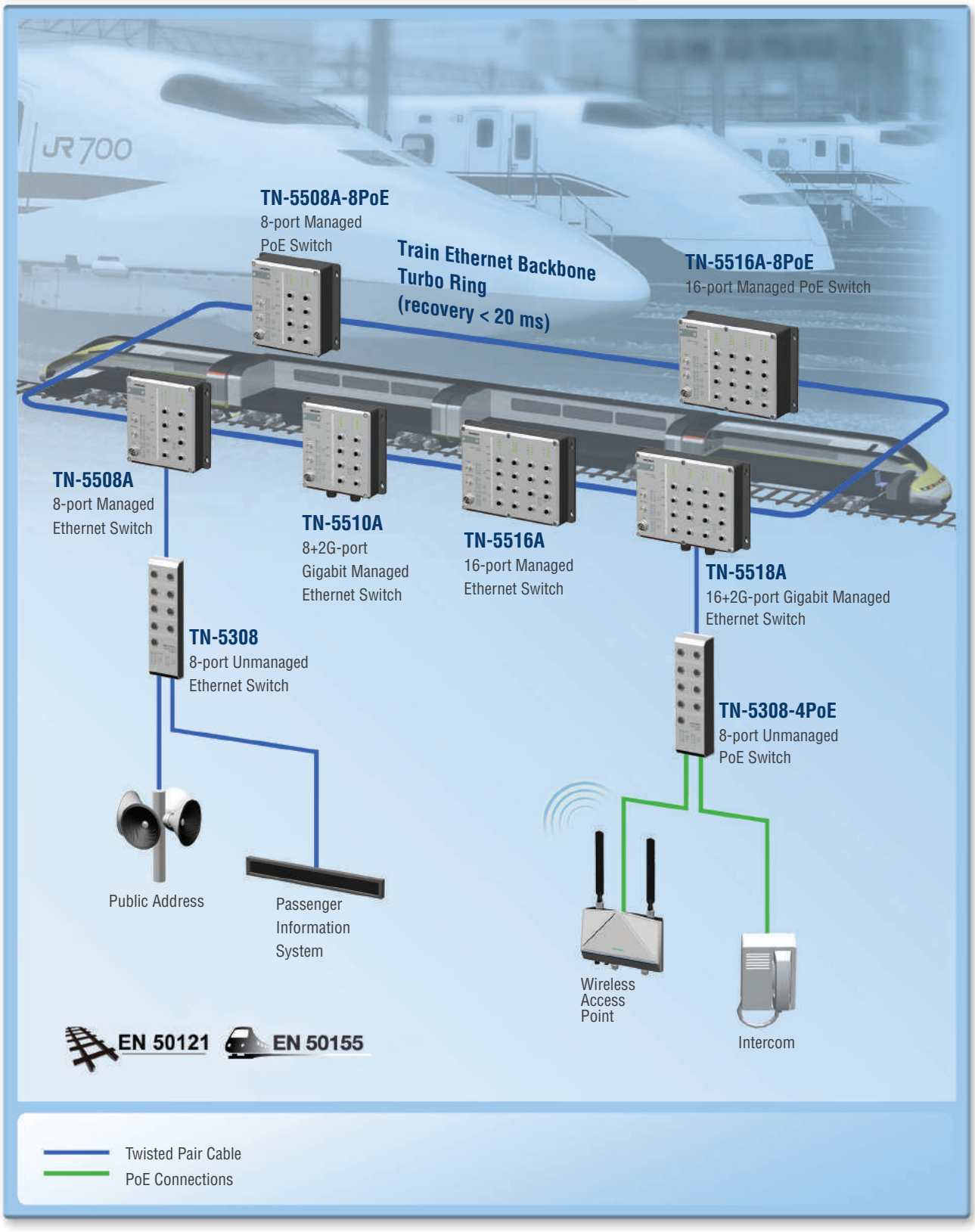
Introduction to EN 50155 Ethernet Switches

Designed for Rolling Stock and Rail Networks



Extensive Selection of EN 50155 Switches for Onboard Train Communications

Moxa's ToughNet Ethernet switches are specially designed to meet EN 50155, the onboard standard for electronic equipment, which encompasses not just EMC requirements but also shock, vibration, extended temperature range, humidity, and power supply variations. To let users choose a precise solution to fit their railway networks, over 100 models are offered. The product line supports the comprehensive features for next-generation train networks, including 10/100/1000 Mbps transmission rate, Power-over-Ethernet, Turbo Ring, bypass relay, and various mounting options.

Compliant with Industry Standards

- EN 50155
- EN 50121-4
- EN 45545-2

M12 Connectors

Robust vibration-proof connections

Wide Power Input Range

For universal applications

- Supports 24 to 110 VDC
- Redundant power inputs (non-PoE models)

Robust vibration-proof connection

- M23 connector

Tough Design

Withstands harsh environments

- -40 to 75°C operating temp.
- Die-cast metal housing
- IP54 protection
- Panel or DIN-rail mounting
- Fan-less design

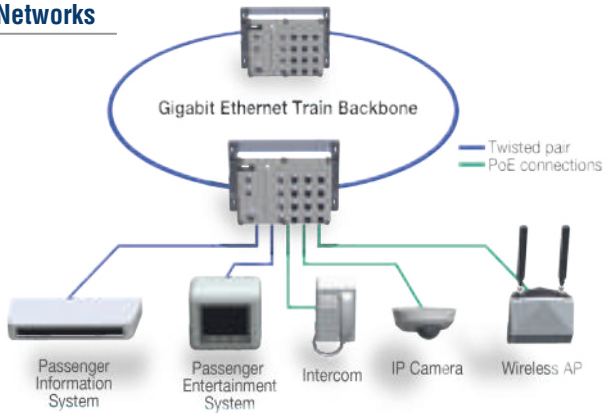
Gigabit Bandwidth

For a higher level of passenger comfort and security

- Gigabit TP ports with or without bypass relay function
- Gigabit ports with X-coded M12 connectors

Future-Proof Gigabit Solution Enables Next-Generation Train Networks

Many new applications in the railway industry, such as video surveillance, emergency intercom, and web-like entertainment require large amounts of bandwidth. Moxa's TN-5510A/5518A provides 2 Gigabit ports to allow video, audio, and data transmission over a single network.



Power-over-Ethernet Simplifies Network Connections

All applications can benefit from the ToughNet series' PoE function. Network designers can take advantage of the Power-over-Ethernet technology to power networked devices in difficult to reach locations and to simplify field wiring to reduce installation costs.

Enable High Network Availability with Excellent Redundancy

Turbo Ring™ for Ring Redundancy

All of Moxa's managed Ethernet switches support Turbo Ring™, which has a super fast fault recovery of under 20 ms at a full load of 250 Ethernet switches to minimize downtime caused by network failure. If a path in the network fails, the system will return to normal communication in under 20 ms.

Bypass Relay Function for Linear Topologies

In a linear topology, a failure in any of the upstream links will result in the failure of the downstream links as well. For railway communication systems with interconnected networks, such a failure will cause chaos. To prevent such a failure, Moxa's TN-5510A/5518A series provides 2 optional Gigabit Ethernet ports with bypass relay function. If one of the Ethernet switches fails due to power loss, its ports are bypassed with the relay circuit, and the transmission lines will interconnect automatically to assure continuous system operation.

TN-5916 Series

EN 50155 16-port NAT router

- Designed for rolling stock backbone networks
- Dual bypass relay
- Isolated power input range from 24 to 110 VDC
- Compliant with essential sections of EN 50155*
- -40 to 75°C operating temperature range
- Turbo Ring and RSTP/STP for network redundancy

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

Turbo Ring

EN 50155 CE FC

Introduction

The ToughNet TN-5916, designed for rolling stock backbone networks, is a high performance M12 router with four bypass relay backbone ports. It supports NAT and routing functionality to facilitate the deployment of applications across networks. The TN-5916 router uses M12 and other circular connectors to ensure tight, robust connections that guarantee reliability against environmental disturbances, such as vibration and shock. The TN-5916 router provides a wide power input range of 24 to 110 VDC. The TN-5916 operates in an extended operating temperature range of -40 to 75°C and is compliant with EN 50155/50121-4 requirements, making the router suitable for a variety of industrial applications.

Features and Benefits

- Routing functionality to divide a large network into hierarchical subnets and allow data and information to communicate across networks
- NAT makes IP management easier, since end devices in different carriages can use the same IP addresses
- Leading EN 50155-compliant Ethernet router for rolling stock applications
- Turbo Ring and RSTP/STP for network redundancy
- IGMP V1/V2 snooping for filtering multicast traffic
- IEEE 802.1Q VLAN to ease network planning
- QoS (IEEE 802.1p/1Q and TOS/DiffServ) to improve reliability
- IEEE 802.3ad for Static Port Trunking
- SNMPv3, HTTPS, and SSH to enhance network security
- SNMP v1/v2c/v3 for different levels of network management
- Port mirroring for online debugging
- Automatic warning by exception through email and relay output
- Line-swap fast recovery
- Automatic recovery of connected device's IP addresses
- LLDP for automatic topology discovery in network management software
- Configurable by web browser, Telnet/serial console, and CLI Windows utility
- Panel mounting or DIN-rail mounting installation capability

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.3ad for Static Port Trunking

Software Features

Management: SNMP v1/v2c/v3, Account Management, Telnet, Console - CLI, DHCP Server, LLDP, Port Mirror, Syslog, TFTP, SMTP Client, RARP, HTTP, HTTPS, SNMP inform, Flow Control, Back pressure flow control
Filter: 802.1Q VLAN, IGMPv1/v2, Static Multicast
Redundancy Protocols: STP/RSTP, Turbo Ring v2, Static Port Trunk
Security: Management Interface Control (TCP/UDP port blocking), Trusted Access Control
Time Management: SNTP, NTP Server/Client
Routing Redundancy: VRRP
NAT: N-1 NAT, 1-1 NAT, Port Forwarding

Router Properties

Priority Queues: 4
Max. Number of VLANs: 16
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet: Front cabling, M12 D-coded 4-pin female connector, 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection, with 4 bypass relays on backbone ports
Console Port: M12 A-coded 5-pin male connector
Alarm Contact: 2 relay outputs in one M12 A-coded 5-pin male connector with current carrying capacity of 1 A @ 30 VDC

Power Requirements

Input Voltage: 24/36/48/72/96/110 VDC
Operating Voltage: 16.8 to 137.5 VDC
Input Current: 0.85 A @ 24 VDC; 0.17 A @110 VDC

Overload Current Protection: Present
Connection: M23 connector
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Aluminium alloy
IP Rating: IP54 protection (optional protective caps available for unused ports)
Dimensions: 250 x 175.8 x 116.3 mm (9.84 x 6.92 x 4.58 in)
Weight: 4030 g (8.88 lb)
Installation: Panel mounting, DIN-rail mounting (with optional kit)

Environmental Limits

Operating Temperature:
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Altitude: 2,000 m

Standards and Certifications

Safety: UL/cUL 508, EN 60950-1 (LVD)
EMC: EN 55022, EN 55024
EMI: CISPR 22, FCC Part 15B Class A

EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Rail Traffic: EN 50155 (essential compliance*), EN 50121-4, EN 45545-2
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
Shock: EN 50155, EN/IEC 61373
Freefall: IEC 60068-2-32
Vibration: EN 50155, EN/IEC 61373
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

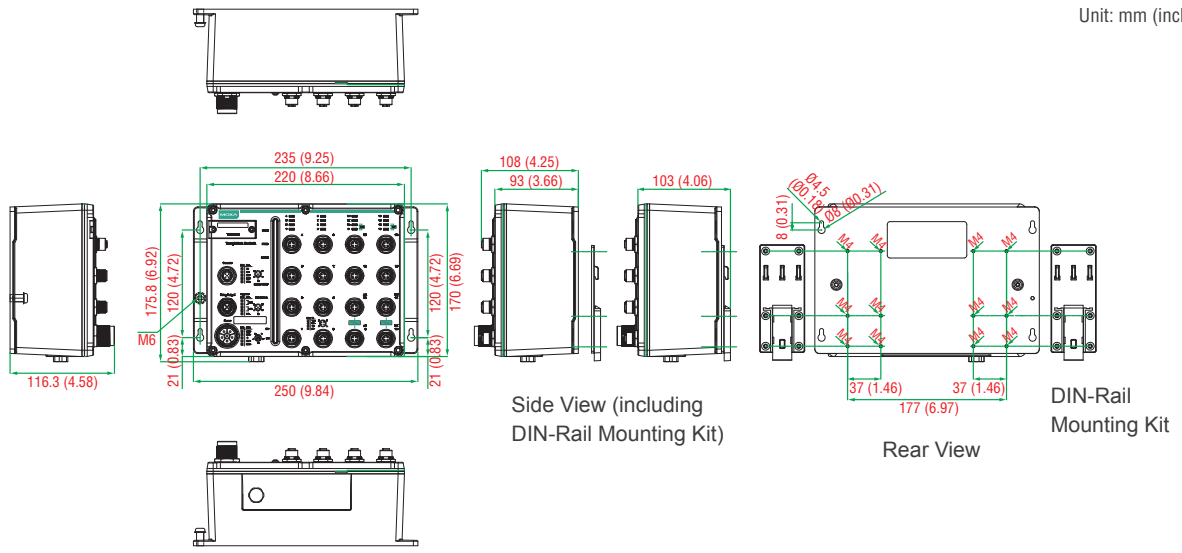
Time: 556,025 hrs
Standard: Telcordia SR332

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models	Port Interface				Power Supply	Conformal Coating
	Front Cabling					
Wide Temperature (-40 to 75C)	10/100BaseT(X), M12 connector	10/100BaseT(X), M12 connector with bypass relay	10/100/1000 10/100BaseT(X), M12 connector	10/100/1000BaseT(X), M12 connector with bypass relay	WV: 24 to 110 VDC (16.8 to 137.5 VDC)	
TN-5916-WV-T	16	4	–	–	1 (Dual Input)	–
TN-5916-WV-CT-T	16	4	–	–	1 (Dual Input)	✓

Optional Accessories (can be purchased separately)

Power Cords, M12/M23 Connectors, Protective Caps: See the EN 50155 Switch Accessories datasheet for details
MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01-M12: Configuration backup and restoration tool for TN series managed Ethernet routers, 0 to 60°C operating temperature

Package Checklist

- TN-5916 router
- M12-to-DB9 console port cable
- 2 protective caps for console and relay output ports
- Panel-mounting kit
- Documentation and software CD
- Hardware installation guide
- Warranty card

TN-5816A/5818A Series

EN 50155 16/16+2G-port layer 3 Gigabit managed Ethernet switches

- Layer 3 routing interconnects multiple LAN segments
- 4 Fast Ethernet ports and 2 optional Gigabit ports with bypass relay function
- Isolated power with 24 to 110 VDC power supply range
- Essential compliance with EN 50155*
- -40 to 75°C operating temperature range
- Turbo Ring and Turbo Chain (recovery time < 20 ms with 250 switches), and STP/RSTP/MSTP for network redundancy

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

Turbo Ring | Turbo Chain | EN 50155 | EN 50121 | CE | FC

Introduction

The ToughNet TN-5816A/5818A switches are high performance M12 Layer 3 Ethernet switches that support Layer 3 routing to facilitate the deployment of applications across networks. By using M12 and other circular connectors, the TN-5516A/5518A series ensures tight, robust connections and reliability against environmental disturbances, such as vibration and shock. TN-5816A/5818A switches provide isolated power with 24 to 110 VDC power input range, which allows you to use the same model at different sites around the globe. In addition, TN-5816A/5818A switches provide up to 16 Fast Ethernet M12 ports with 4 bypass relay ports, and 2 Gigabit Ethernet ports with bypass relay function. Furthermore, the -40 to 75°C operating temperature and IP54-rated water and dust resistant enclosure allow deployment in harsh environments. The TN-5816A/5818A series Ethernet switches are compliant with essential sections of EN 50155, covering operating temperature, power input voltage, surge, ESD, and vibration, as well as conformal coating and power insulation, making the switches suitable for a variety of industrial applications.

Features and Benefits

- Layer 3 switching functionality to divide a large network into hierarchical subnets and allow data and information to communicate across networks
- Leading EN 50155-compliant L3 Ethernet switches for rolling stock applications
- DHCP Option 82 for IP address assignment with different policies
- Turbo Ring, Turbo Chain, and STP/RSTP/MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- IEEE 802.1Q VLAN, and GVRP to ease network planning
- EtherNet/IP and Modbus/TCP industrial Ethernet protocols supported
- QoS (IEEE 802.1p/1Q and ToS/DiffServ) allows real-time traffic classification and prioritization
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port allows access by only authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email, relay output
- Line-swap fast recovery
- LLDP for automatic topology discovery in network management software
- Configurable by web browser, Telnet/serial console, and Windows utility
- Panel mounting or DIN-rail mounting installation capability
- Loop protection to prevent network loops

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid Spanning Tree Protocol
IEEE 802.1s for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Software Features

Management: IPv4, SNMP v1/v2c/v3, Telnet, LLDP, Port Mirror, Syslog, RMON, BootP, DHCP Server/Client, DHCP Option 66/67/82, TFTP, SMTP, RARP, HTTP, HTTPS, SNMP inform, Flow Control, Back pressure flow control
Filter: 802.1Q VLAN, Q-in-Q VLAN, GVRP, IGMPv1/v2/v3, GMRP, Static Multicast
Redundancy Protocols: STP/RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Port Lock, Broadcast Storm Protection, Rate Limit
Multicast Routing: DVMRP, PIM-DM

Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Routing Redundancy: VRRP

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet: Front cabling, M12 D-coded 4-pin female connector, 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Gigabit Ethernet: M12 X-coded 8-pin female connectors, 10/100/1000BaseT(X) auto negotiation speed, F/H duplex mode, auto MDI/MDI-X connection, with bypass relay function
Console Port: M12 A-coded 5-pin male connector
Alarm Contact: 2 relay outputs in one M12 A-coded 5-pin male connector with current carrying capacity of 1 A @ 30 VDC

Power Requirements

Input Voltage: 24/36/48/72/96/110 VDC
Operating Voltage: 16.8 to 137.5 VDC
Input Current:
• TN-5816ABP Series: 1.1 A @ 24 VDC, 0.23 A @ 110 VDC
• TN-5818A Series: 1.24 A @ 24 VDC, 0.26 A @ 110 VDC
Overload Current Protection: Present
Connection: M23 connector
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Aluminium alloy
IP Rating: IP54 protection (optional protective caps available for unused ports)
Dimensions:
TN-5816ABP Series: 250 x 175.8 x 115 mm (9.84 x 6.92 x 4.53 in)
TN-5818A Series: 250 x 181.4 x 115 mm (9.84 x 7.14 x 4.53 in)
Weight:
TN-5816ABP Series: 2990 g (5.62 lb)
TN-5818A Series: 3160 g (6.97 lb)
Installation: Panel mounting, DIN-rail mounting (with optional kit: DK-DC50131)

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Altitude: 2000 m
Note: Please contact Moxa if you require products guaranteed to function at higher altitudes

Standards and Certifications

Safety: UL/cUL 508, EN 60950-1 (LVD)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Rail Traffic: (for panel-mounting installations)
EN 50155 (essential compliance*), EN 50121-4, EN 45545-2
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
Shock: EN 50155, IEC 61373
Freefall: IEC 60068-2-32
Vibration: EN 50155, IEC 61373
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time:
TN-5816ABP series: 577,026 hrs
TN-5818A-2GTXBP series: 525,091 hrs
Standard: Telcordia SR332

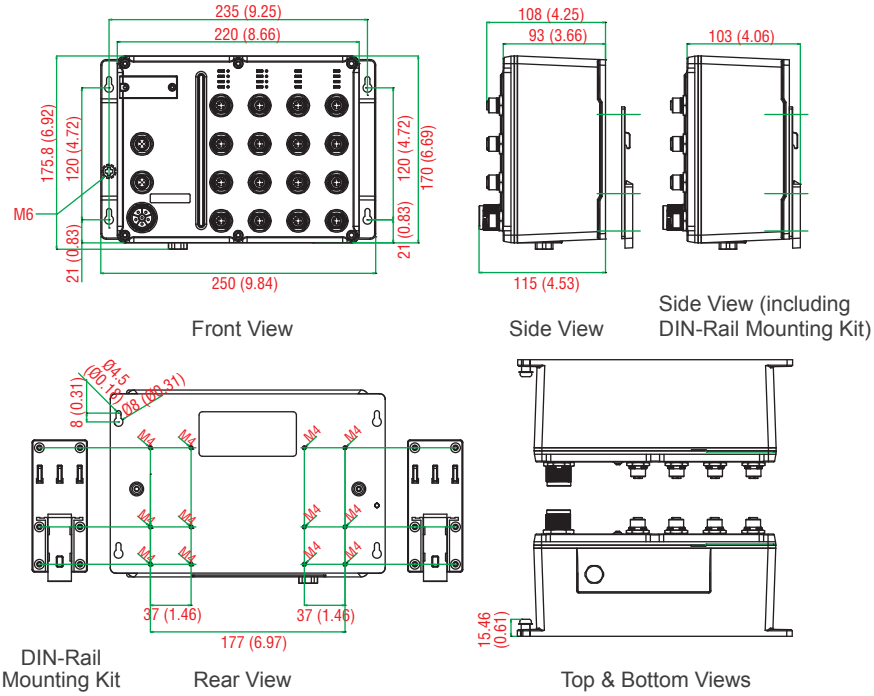
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

TN-5816A Series

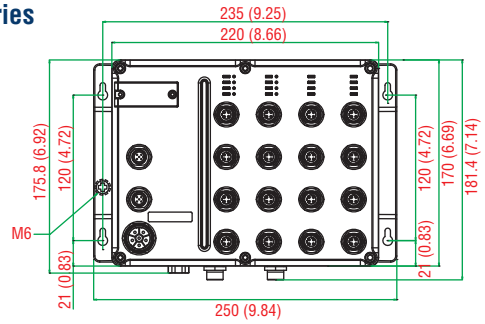
Unit: mm (inch)



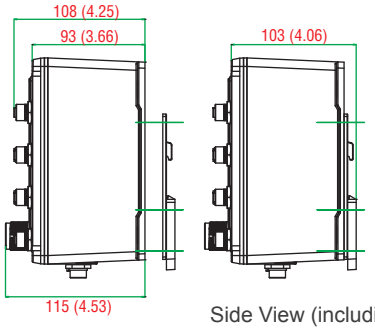
Dimensions

TN-5818A Series

Unit: mm (inch)

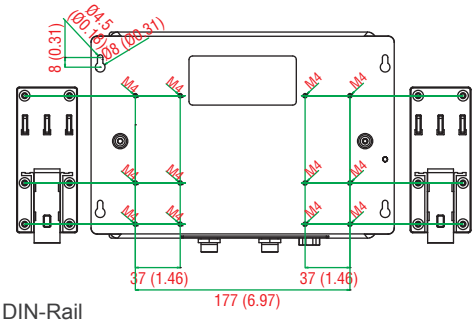


Front View



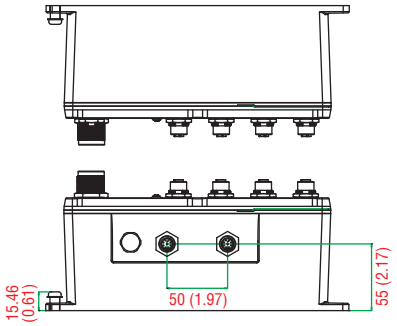
Side View

Side View (including DIN-Rail Mounting Kit)



DIN-Rail Mounting Kit

Rear View



Top & Bottom Views

Ordering Information

Available Models	Port Interface			Power Supply	Conformal Coating
	Front Cabling		Down Cabling		
Wide Temperature (-40 to 75°C)	10/100BaseT(X), M12 connector	10/100BaseT(X), M12 connector	10/100/1000BaseT(X), M12 connector, with bypass relay	WV: 24 to 110 VDC (16.8 to 137.5 VDC)	
TN-5816A Series					
TN-5816ABP-WV-T	12	4	–	1	–
TN-5816ABP-WV-CT-T	12	4	–	1	✓
TN-5818A Series					
TN-5818A-2GTXBP-WV-T	12	4	2	1	–
TN-5818A-2GTXBP-WV-CT-T	12	4	2	1	✓

Definitions:
1. GTXBP: Gigabit Ethernet copper port with bypass relay
2. WV: Wide Voltage
3. CT: Conformal Coating

Note: Conformal coating is available on request.

Optional Accessories (can be purchased separately)

Power Cords, M12/M23 Connectors, Protective Caps: See the EN 50155 Switch Accessories datasheet for details

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01-M12: Configuration backup and restore tool for TN series managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- TN-5816A or TN-5818A series switch
- M12-to-DB9 console port cable
- 2 protective caps for console and relay output ports
- Panel-mounting kit
- Documentation and software CD
- Hardware installation guide
- Warranty card

TN-5524-8PoE Series

EN 50155 24-port managed Ethernet switches with 8 PoE ports

- IEEE 802.3af compliant PoE ports
- Provides up to 15.4 watts at 48 VDC per PoE port
- Isolated power inputs with universal 24 VDC power supply
- Essential compliance with EN 50155*
- -40 to 75°C operating temperature range (T models)
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

EN 50155 EN 50121

Introduction

The ToughNet TN-5500 series M12 PoE managed Ethernet switches are designed for railway applications, such as rolling stock, and wayside installations. The TN series switches use M12 and other circular connectors to ensure tight, robust connections, and guarantee reliable operation against environmental disturbances, such as vibration and shock. The TN-5524-8PoE series Ethernet switches provide 24 Fast Ethernet M12 ports with 8 IEEE 802.3af compliant PoE (Power-over-Ethernet) ports. The PoE switches are classified as power source equipment (PSE) and provide up to 15.4 watts of power per port, and can be used to power IEEE 802.3af compliant powered devices (PDs) (such as surveillance cameras, wireless access points, and IP phones). Models with an extended operating temperature range of -40 to 75°C are also available. The TN-5500-PoE series Ethernet switches are compliant with essential sections of EN 50155, covering operating temperature, power input voltage, surge, ESD, and vibration, as well as conformal coating and power insulation, making the switches suitable for a variety of industrial applications.

Features and Benefits

- Advanced PoE management function
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Leading EN50155-compliant PoE switches for rolling stock applications
- DHCP Option 82 for IP address assignment with different policies
- EtherNet/IP and Modbus/TCP industrial Ethernet protocol supported
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q and TOS/DiffServ) to increase determinism
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port allows access by only authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email, relay output
- Line-swap fast recovery
- Automatic recovery of connected device's IP addresses
- LLDP for automatic topology discovery in network management software
- Configurable by web browser, Telnet/serial console, CLI, and Windows utility
- Panel mounting installation capability

Specifications

Technology

Standards:
IEEE 802.3af for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, Telnet, LLDP, Port Mirror, Syslog, RMON, BootP, DHCP Server/Client, DHCP Option 66/67/82, TFTP, SMTP, RARP, HTTP, HTTPS, SNMP inform, Flow Control, Back pressure flow control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMPv1/v2, GMRP, Static Multicast
Redundancy Protocols: STP/RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Port Lock, Broadcast Storm Protection, Rate Limit
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)

Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet: Front cabling, M12 D-coded 4-pin female connector, 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Console Port: M12 A-coded 5-pin male connector
Alarm Contact: 2 relay outputs in one M12 A-coded 5-pin male connector with current carrying capacity of 3 A @ 30 VDC

Power Requirements

Input Voltage: 24 VDC
Operating Voltage: 16.8 to 30 VDC
Input Current: 8.4 (max.) @ 24 VDC
Overload Current Protection: Present
Connection: M23 connector
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal
IP Rating: IP40 protection (optional protective caps available for unused ports)
Dimensions: 390 x 132 x 122.3 mm (15.35 x 5.20 x 4.81 in)
Weight: 3,506 g (7.73 lb)
Installation: Panel-mounting kit

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Altitude: 2000 m
Please contact Moxa if you require products guaranteed to function at higher altitudes

Standards and Certifications

Safety: UL/cUL 508
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Rail Traffic: (for panel-mounting installations)
EN 50155 (essential compliance*), EN 50121-4, EN 45545-2
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
Shock: EN 50155, IEC 61373
Freefall: IEC 60068-2-32
Vibration: EN 50155, IEC 61373
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

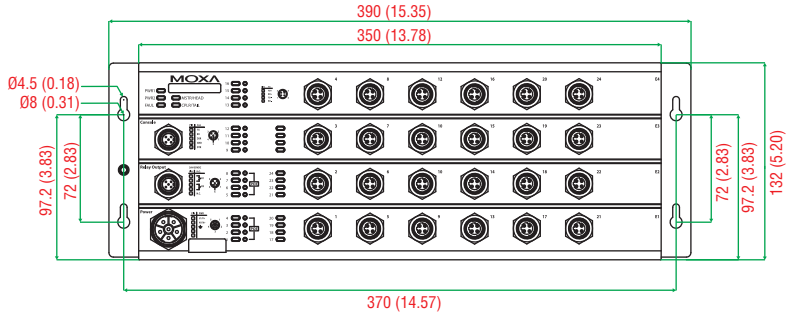
Time: 663,533 hrs
Standard: Telcordia SR332

Warranty

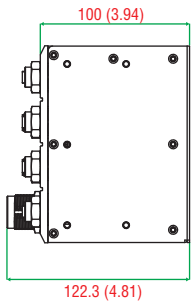
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

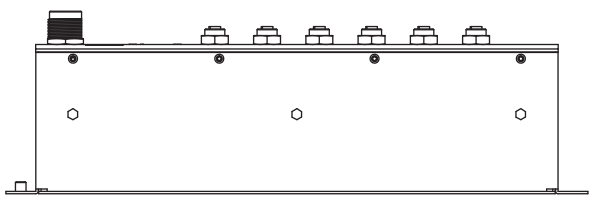
Unit: mm (inch)



Front View



Side View



Bottom View

Ordering Information

Available Models	Port Interface				Power Supply				
Wide Temperature (-40 to 75°C)	PoE, 10/100 BaseT(X), M12 Connector	10/100 BaseT(X), M12 Connector	10/100/1000 BaseT(X), M12 Connector	1000 Mbps Fiber Optic Q-ODC	P24 VDC (16.8 to 30 V)	PLV: 36/48 VDC (25.2 to 60 VDC)	PMV: 72/96/110 VDC (50.4 to 137.5 VDC)	WV: 24/36/48/ 72/96/110 VDC	Conformal Coating
TN-5524-8PoE-P24-T	8	16	–	–	1	–	–	–	–
TN-5524-8PoE-P24-CT-T	8	16	–	–	1	–	–	–	✓

Optional Accessories (can be purchased separately)

Power Cords, M12 Connectors, Protective Caps: See the EN 50155 Switch Accessories datasheet for details
MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01-M12: Configuration backup and restoration tool for TN series managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- TN-5524-8PoE switch
- M12-to-DB9 console port cable
- 2 protective caps for console and relay output ports
- Panel-mounting kit
- Documentation and software CD
- Hardware installation guide
- Warranty card

TN-5510A/5518A Series

EN 50155 8+2G/16+2G-port Gigabit Ethernet switches with up to 8 PoE ports

- 2 Gigabit ports with optional bypass relay function
- 8 IEEE 802.3at/af compliant PoE and Ethernet combo ports
- Provides up to 30 watts at 48 VDC per PoE port
- Isolated power with wide 24 to 110 VDC power supply range
- Essential compliance with EN 50155*
- -40 to 75°C operating temperature range
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), and STP/RSTP/MSTP for network redundancy

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

EN 50155 EN 50121

Introduction

The ToughNet TN-5500A series M12 managed Ethernet switches are designed for railway applications, such as rolling stock, and wayside installations. The TN series switches use M12 and other circular connectors to ensure tight, robust connections, and guarantee reliable operation against environmental disturbances, such as vibration and shock. The TN-5500A series Ethernet switches provide 8 or 16 Fast Ethernet M12 ports with or without 8 IEEE 802.3at/af compliant PoE (Power-over-Ethernet) ports, and 2 ports on the down side to provide the Gigabit Ethernet interface with an optional bypass relay function. The PoE switches are classified as power source equipment (PSE) and provide up to 30 watts of power per port, and can be used to power IEEE 802.3at/af compliant powered devices (PDs), such as IP surveillance, wireless access points, and IP phones. The TN-5500A series provides a wide power input range of 24/36/48/72/96/110 VDC that allows you to use the same type of power source at different sites around the globe. In addition, the 24 to 110 VDC wide power input range and isolated power increases the reliability of your communications system. In addition, the -40 to 75°C operating temperature and IP54 rated waterproof enclosure allow deployment in harsh environments. The TN-5500A series Ethernet switches are compliant with essential sections of EN 50155, covering operating temperature, power input voltage, surge, ESD, and vibration, as well as conformal coating and power insulation, making the switches suitable for a variety of industrial applications.

Features and Benefits

- Provides up to 30 watts per PoE port with a total power budget of 120 watts per switch
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Leading EN 50155-compliant PoE switches for rolling stock applications
- DHCP Option 82 for IP address assignment with different policies
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), and STP/RSTP/MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- EtherNet/IP and Modbus/TCP industrial Ethernet protocols supported
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q and ToS/DiffServ) allows real-time traffic classification and prioritization
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- SNMPv1/v2c/v3 for different levels of network management
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port allows access by only authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email, relay output
- Line-swap fast recovery
- LLDP for automatic topology discovery in network management software
- Configurable by web browser, Telnet/serial console, CLI, and Windows utility
- Loop protection prevents network loops
- Panel mounting or DIN-rail mounting installation capability

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid Spanning Tree Protocol
IEEE 802.1s for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, Telnet, LLDP, Port Mirror, Syslog, RMON, BootP, DHCP Server/Client, DHCP Option 66/67/82, TFTP, SMTP, RARP, HTTP, HTTPS, SNMP inform, Flow Control, Back pressure flow control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMPv1/v2, GMRP, Static Multicast
Redundancy Protocols: STP/RSTP, MSTP, Turbo Ring v1/v2, Turbo Ring v2 with DRC, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Port Lock, Broadcast Storm Protection, Rate Limit
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (SW-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet: Front cabling, M12 D-coded 4-pin female connector, 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Gigabit Ethernet: Down cabling, M12 X-coded 8-pin female connector, 10/100/1000BaseT(X) auto negotiation speed, F/H duplex mode, auto MDI/MDI-X connection, with or without bypass relay function
Console Port: M12 A-coding 5-pin male connector
Alarm Contact: 2 relay outputs in one M12 A-coding 5-pin male connector with current carrying capacity of 1 A @ 30 VDC

Power Requirements

Input Voltage: 24/36/48/72/96/110 VDC
Operating Voltage: 16.8 to 137.5 VDC
Overload Current Protection: Present
Connection: M23 connector
Reverse Polarity Protection: Present
Input Current:
TN-5510A non-PoE series: 0.56 A @ 24 VDC; 0.13 A @ 110 VDC
TN-5518A non-PoE series: 0.68 A @ 24 VDC; 0.16 A @ 110 VDC
TN-5510A-8PoE series: 7.90 A @ 24 VDC; 1.61 A @ 110 VDC
TN-5518A-8PoE series: 8.66 A @ 24 VDC; 1.69 A @ 110 VDC

Physical Characteristics

Housing: Aluminium alloy
IP Rating: IP54 protection (optional protective caps available for unused ports)
Dimensions:
TN-5510A non-PoE Series: 185 x 180.9 x 76.0 mm (7.28 x 7.12 x 2.99 in)
TN-5518A non-PoE Sseries: 250 x 180.9 x 76.0 mm (9.84 x 7.12 x 2.99 in)
TN-5510A-8PoE Series: 185 x 180.9 x 115 mm (7.28 x 7.12 x 4.53 in)
TN-5518A-8PoE Series: 250 x 180.9 x 115 mm (9.84 x 7.12 x 4.53 in)
Weight:
TN-5510A non-PoE Series: 1,711 g (3.77 lb)
TN-5518A non-PoE Series: 2,250 g (4.96 lb)
TN-5510A-8PoE: 2,551 g (5.62 lb)
TN-5518A-8PoE: 3,439 g (7.58 lb)
Installation: Panel mounting, DIN-Rail mounting (with optional kit: DK-DC50131)

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Altitude: 2000 m
Note: Please contact Moxa if you require products guaranteed to function at higher altitudes

Standards and Certifications

Safety: UL/cUL 508, EN 60950-1 (LVD)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 ESD: Contact 6 kV; Air 8 kV
IEC 61000-4-3 RS: 20 V/m (80 MHz to 1 GHz)
IEC 61000-4-4 EFT: Power 2 kV; Signal 2 kV
IEC 61000-4-5 Surge: Power 2 kV; Signal 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Rail Traffic: (for panel mounting installations)
EN 50155 (essential compliance*), EN 50121-4, EN 50121-3-2, EN 45545-2
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
Shock: EN 50155, IEC 61373
Freefall: IEC 60068-2-32
Vibration: EN 50155, IEC 61373
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time:
TN-5510A-2GTX series: 758,855 hrs
TN-5510A-2GTXBP series: 742,880 hrs
TN-5518A-2GTX series: 647,128 hrs
TN-5518A-2GTXBP series: 628,808 hrs
TN-5510A-8PoE-2GTX: 502,756 hrs
TN-5510A-8PoE-2GTXBP: 495,703 hrs
TN-5518A-8PoE-2GTX: 448,300 hrs
TN-5518A-8PoE-2GTXBP: 439,442 hrs
Standard: Telcordia SR332

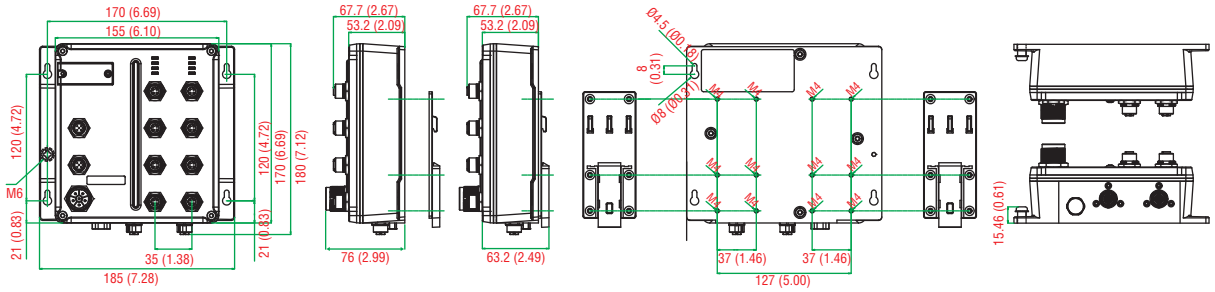
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

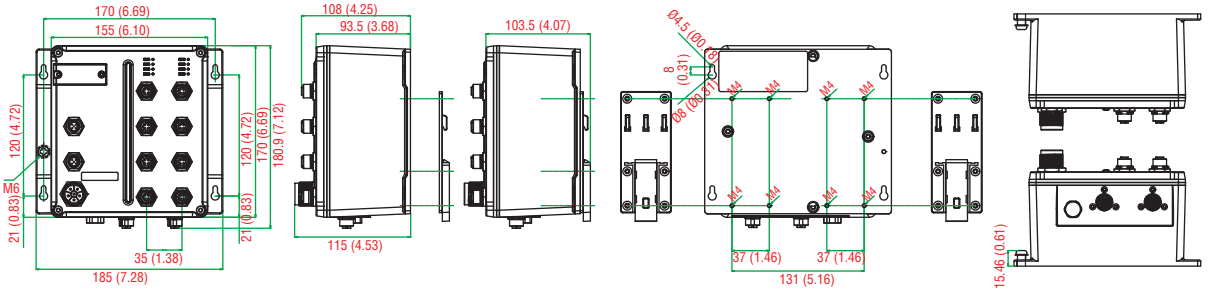
Unit: mm (inch)

TN-5510A non-PoE Series



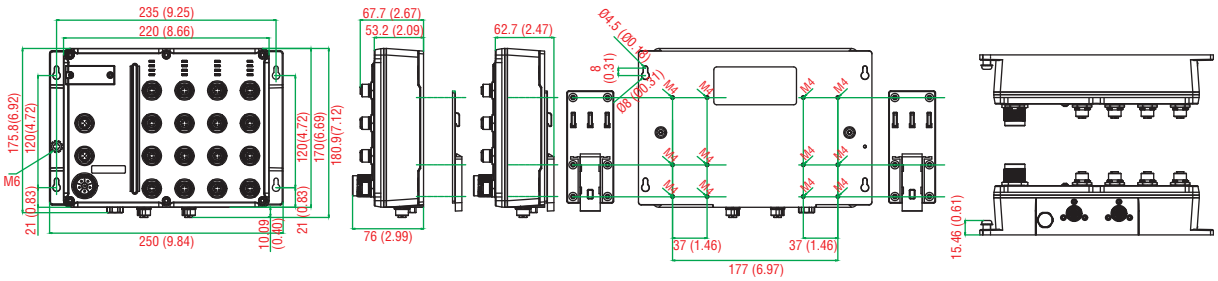
Front View | Side View (including DIN-Rail Mounting Kit) | DIN-Rail Mounting Kit | Rear View | Top & Bottom Views

TN-5510A-8PoE Series



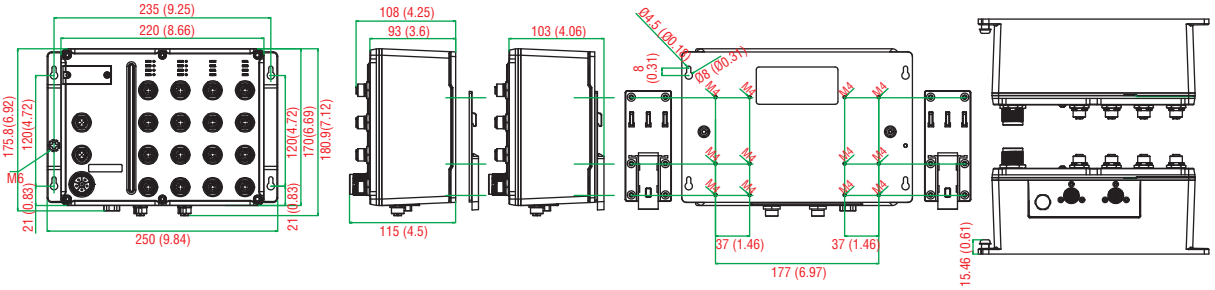
Front View | Side View (including DIN-Rail Mounting Kit) | DIN-Rail Mounting Kit | Rear View | Top & Bottom Views

TN-5518A non-PoE Series



Front View | Side View (including DIN-Rail Mounting Kit) | Rear View | DIN-Rail Mounting Kit | Top & Bottom Views

TN-5518A-8PoE Series



Front View | Side View (including DIN-Rail Mounting Kit) | DIN-Rail Mounting Kit | Rear View | Top & Bottom Views

Ordering Information

Available Models	Port Interface				Power Supply	Conformal Coating
	Front Cabling		Down Cabling			
Wide Temperature (-40 to 75°C)	PoE, 10/100BaseT(X), M12 connector	10/100BaseT(X), M12 connector	10/100/1000 BaseT(X), M12 connector	10/100/1000 BaseT(X), M12 connector with bypass relay	WV: 24 to 110 VDC (16.8 to 137.5 VDC)	
TN-5510A Series						
TN-5510A-2GTX-WV-T	–	8	2	–	Dual Input	–
TN-5510A-2GTX-WV-CT-T	–	8	2	–	Dual Input	✓
TN-5510A-2GTXBP-WV-T	–	8	–	2	Dual Input	–
TN-5510A-2GTXBP-WV-CT-T	–	8	–	2	Dual Input	✓
TN-5518A Series						
TN-5518A-2GTX-WV-T	–	16	2	–	Dual Input	–
TN-5518A-2GTX-WV-CT-T	–	16	2	–	Dual Input	✓
TN-5518A-2GTXBP-WV-T	–	16	–	2	Dual Input	–
TN-5518A-2GTXBP-WV-CT-T	–	16	–	2	Dual Input	✓
TN-5510A-8PoE Series						
TN-5510A-8PoE-2GTX-WV-T	8	–	2	–	1	–
TN-5510A-8PoE-2GTX-WV-CT-T	8	–	2	–	1	✓
TN-5510A-8PoE-2GTXBP-WV-T	8	–	–	2	1	–
TN-5510A-8PoE-2GTXBP-WV-CT-T	8	–	–	2	1	✓
TN-5518A-8PoE Series						
TN-5518A-8PoE-2GTX-WV-T	8	8	2	–	1	–
TN-5518A-8PoE-2GTX-WV-CT-T	8	8	2	–	1	✓
TN-5518A-8PoE-2GTXBP-WV-T	8	8	–	2	1	–
TN-5518A-8PoE-2GTXBP-WV-CT-T	8	8	–	2	1	✓

Optional Accessories (can be purchased separately)

Power Cords, M12 Connectors, Protective Caps: See the EN 50155 Switch Accessories datasheet for details

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01-M12: Configuration backup and restoration tool for TN series managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- TN-5500A switch
- 2 protective caps for console and relay output ports
- Panel mounting kit
- Hardware installation guide
- Warranty card

TN-5510A-2GLSX-ODC Series

EN 50155 8+2G-port Q-ODC® managed Ethernet switches with up to 8 PoE ports

- 2 Gigabit fiber ports with embedded multi-mode Q-ODC® interface
- Isolated power inputs with wide 24 to 110 VDC power supply range
- Essential compliance with EN 50155*
- -40 to 75°C operating temperature range
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), and STP/RSTP/MSTP for network redundancy
- 8 IEEE 802.3at/af compliant combo PoE and Ethernet ports
- Provides up to 30 watts per PoE port

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

EN 50155 EN 50121

Introduction

The ToughNet TN-5510A-2GLSX-ODC and TN-5510A-8PoE-2GLSX-ODC series M12 managed Ethernet switches are designed for railway applications, such as rolling stock and wayside installations. The TN series switches use M12 and other circular connectors to ensure tight, robust connections, and guarantee reliable operation against environmental disturbances, such as vibration and shock. In addition, the 24 to 110 VDC wide power input range and isolated power inputs not only allow you to use the same type of power source at different sites around the globe, but also increase the reliability of your communications system. The TN-5510A-2GLSX-ODC and TN-5510A-8PoE-2GLSX-ODC switches provide up to 8 Fast Ethernet M12 ports, and 2 ports on the down side to provide the Gigabit fiber interface with an embedded 2 km multimode fiber transceiver.

The TN-5510A-8PoE-2GLSX-ODC series Ethernet switches have 8 Fast Ethernet M12 ports with 8 IEEE 802.3at/af compliant PoE (Power-over-Ethernet) ports. The PoE switches are classified as power source equipment (PSE); they provide up to 30 watts of power per port, and can be used to power IEEE 802.3at/af compliant powered devices (PDs), such as IP cameras, wireless access points, and IP phones. Moreover, the -40 to 75°C operating temperature and IP54-rated waterproof and dustproof enclosure allow deployment in harsh environments. The TN-5500A series Ethernet switches are compliant with essential sections of EN 50155, covering operating temperature, power input voltage, surge, ESD, and vibration, as well as conformal coating and power insulation, making the switches suitable for a variety of industrial applications.

Features and Benefits

- Provides up to 30 watts per PoE port with a total power budget of 120 watts per switch
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Leading EN 50155-compliant Gigabit Ethernet switches for rolling stock applications
- DHCP Option 82 for IP address assignment with different policies
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), and STP/RSTP/MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- EtherNet/IP and Modbus/TCP industrial Ethernet protocols supported
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q and ToS/DiffServ) allows real-time traffic classification and prioritization
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- SNMPv1/v2c/v3 for different levels of network management
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port allows access by only authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email, relay output
- Line-swap fast recovery
- LLDP for automatic topology discovery in network management software
- Configurable by web browser, Telnet/serial console, CLI, and Windows utility
- Loop protection prevents network loops
- Panel mounting or DIN-rail mounting installation capability

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid Spanning Tree Protocol
IEEE 802.1s for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, Telnet, LLDP, Port Mirror, Syslog, RMON, BootP, DHCP Server/Client, DHCP Option 66/67/82, TFTP, SMTP, RARP, HTTP, HTTPS, SNMP inform, Flow Control, Back pressure flow control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMPv1/v2, GMRP, Static Multicast
Redundancy Protocols: STP/RSTP, MSTP, Turbo Ring v1/v2, Turbo Ring v2 with DRC, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Port Lock, Broadcast Storm Protection, Rate Limit
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet: Front cabling, M12 D-coded 4-pin female connector, 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Gigabit Ethernet: Down cabling, Q-ODC® connector, 1000M (Gigabit Ethernet port), PoE (for PoE models)
Console Port: M12 A-coded 5-pin male connector
Alarm Contact: 2 relay outputs in one M12 A-coded 5-pin male connector with current carrying capacity of 1 A @ 30 VDC

Power Requirements

Input Voltage: 24/36/48/72/96/110 VDC
Operating Voltage: 16.8 to 137.5 VDC
Input Current:
TN-5510A-2GLSX-ODC series: 0.45 A @ 24 VDC; 0.1 A @ 110 VDC
TN-5510A-8PoE-2GLSX-ODC series: 7.8 A @ 24 VDC; 1.58 A @110 VDC
Overload Current Protection: Yes
Connection: M23 connector
Reverse Polarity Protection: Yes

Physical Characteristics

Housing: Aluminium alloy
IP Rating: IP54 protection (optional protective caps available for unused ports)
Dimensions:
- TN-5510A-2GLSX-ODC series:
  185 x 204.3 x 76.0 mm (7.28 x 8.04 x 2.99 in)
- TN-5510A-8PoE-2GLSX-ODC series:
  185 x 219.3 x 115 mm (7.28 x 8.63 x 4.53 in)

Weight:
TN-5510A-2GLSX-ODC series: 1,805 g (3.97 lb)
TN-5510A-8PoE-2GLSX-ODC series: 2,690 g (5.93 lb)
Installation: Panel mounting, DIN-rail mounting (with optional kit: DK-DC50131)

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Altitude: Up to 2000 m
Note: Please contact Moxa if you require products guaranteed to function at higher altitudes

Standards and Certifications

Safety: UL/cUL 508, EN 60950-1 (LVD)
EMC: EN 55022, EN 55024
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Rail Traffic: (for panel-mounting installations)
EN 50155 (essential compliance*), EN 50121-4, EN 50121-3-2, EN 45545-2
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
Shock: EN 50155, IEC 61373
Freefall: IEC 60068-2-32
Vibration: EN 50155, IEC 61373
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time:
TN-5510A-2GLSX-ODC series: 722,049 hrs
TN-5510A-8PoE-2GLSX-ODC series: 486,560 hrs
Standard: Telcordia SR332
Note: Please check Moxa's website for the most up-to-date certification status.

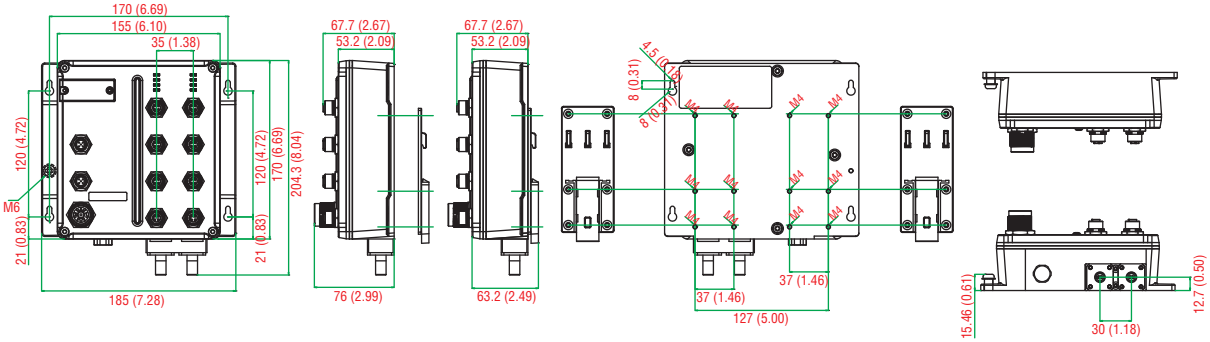
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

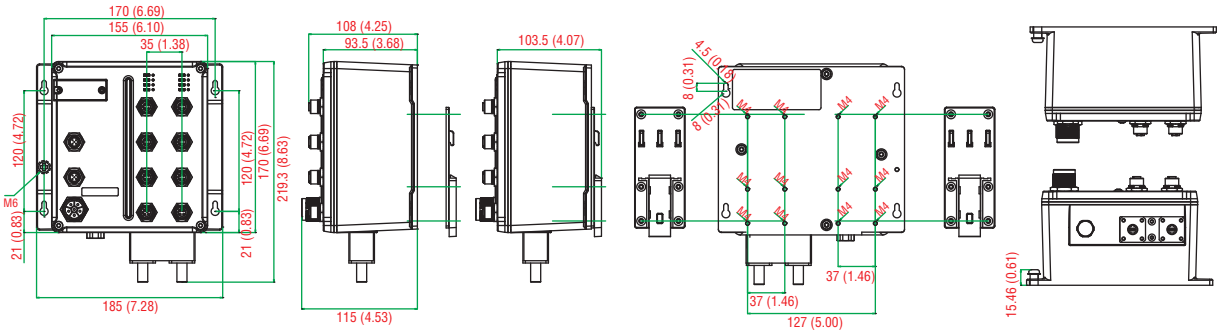
Unit: mm (inch)

TN-5510A-2GLSX-ODC Series



Front View | Side View (including DIN-Rail Mounting Kit) | DIN-Rail Mounting Kit | Rear View | Top & Bottom Views

TN-5510A-8PoE-2GLSX-ODC Series



Front View | Side View (including DIN-Rail Mounting Kit) | DIN-Rail Mounting Kit | Rear View | Top & Bottom Views

Ordering Information

Available Models	Port Interface			Power Supply	Conformal Coating
	Front Cabling	Down Cabling			
Wide Temperature (-40 to 75°C)	PoE, 10/100 BaseT(X), M12 connector	10/100baseT(X), M12 connector	1000BaseLSX fiber optic, Q-ODC® interface	WV: 24 to 110 VDC (16.8 to 137.5 VDC)	
TN-5510A-2GLSX-ODC Series					
TN-5510A-2GLSX-ODC-WV-T	–	8	2	1 (Dual Input)	–
TN-5510A-2GLSX-ODC-WV-CT-T	–	8	2	1 (Dual Input)	✓
TN-5510A-8PoE-2GLSX-ODC Series					
TN-5510A-8PoE-2GLSX-ODC-WV-T	8	–	2	1	–
TN-5510A-8PoE-2GLSX-ODC-WV-CT-T	8	–	2	1	✓

Definitions:
1. GLSX: Gigabit fiber with 2 km fiber transceiver
2. Q-ODC®: Quick-Outdoor Connector
3. CT: Conformal Coating
4. WV: Wide Voltage

Optional Accessories (can be purchased separately)

Power Cords, M12 Connectors, Protective Caps: See the EN 50155 Switch Accessories datasheet for details
MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01-M12: Configuration backup and restoration tool for TN series managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- 1 TN-5500A switch
- M12-to-DB9 console port cable
- 2 protective caps for console and relay output ports
- Panel-mounting kit
- Documentation and software CD
- Hardware installation guide
- Warranty card

TN-5508A/5516A Series

EN 50155 8/16-port managed Ethernet switches with up to 8 PoE ports

- 8 IEEE 802.3at/af compliant PoE and Ethernet combo ports
- Provides up to 30 watts at 48 VDC per PoE port
- Isolated power with wide 24 to 110 VDC power supply range
- Essential compliance with EN 50155*
- -40 to 75°C operating temperature range
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), and STP/RSTP/MSTP for network redundancy

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

EN 50155 EN 50121

Introduction

The ToughNet TN-5500A series M12 managed Ethernet switches are designed for railway applications, such as rolling stock, and wayside installations. The TN series switches use M12 and other circular connectors to ensure tight, robust connections, and guarantee reliable operation against environmental disturbances, such as vibration and shock. The TN-5500A series Ethernet switches provide 8 or 16 Fast Ethernet M12 ports with or without 8 IEEE 802.3at/af compliant PoE (Power-over-Ethernet) ports. The PoE switches are classified as power source equipment (PSE) and provide up to 30 watts of power per port, and can be used to power IEEE 802.3at/af compliant powered devices (PDs), such as IP cameras, wireless access points, and IP phones.

In addition, the 24 to 110 VDC wide power input range and isolated power inputs not only allow you to use the same type of power source at different sites around the globe, but also increase the reliability of your communications system. In addition, the -40 to 75°C operating temperature and IP54-rated waterproof and dustproof enclosure allow deployment in harsh environments. Moreover, the TN-5500A series Ethernet switches are compliant with essential sections of EN 50155, covering operating temperature, power input voltage, surge, ESD, and vibration, as well as conformal coating and power insulation, making the switches suitable for a variety of industrial applications.

Features and Benefits

- Provides up to 30 watts per PoE port with a total power budget of 120 watts per switch
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Leading EN 50155-compliant PoE switches for rolling stock applications
- DHCP Option 82 for IP address assignment with different policies
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), and STP/RSTP/MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- EtherNet/IP and Modbus/TCP industrial Ethernet protocols supported
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q and ToS/DiffServ) allows real-time traffic classification and prioritization
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- SNMPv1/v2c/v3 for different levels of network management
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port allows access by only authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email, relay output
- Line-swap fast recovery
- LLDP for automatic topology discovery in network management software
- Configurable by web browser, Telnet/serial console, CLI, and Windows utility
- Loop protection prevents network loops
- Panel mounting or DIN-rail mounting installation capability

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid Spanning Tree Protocol
IEEE 802.1s for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, Telnet, LLDP, Port Mirror, Syslog, RMON, BootP, DHCP Server/Client, DHCP Option 66/67/82, TFTP, SMTP, RARP, HTTP, HTTPS, SNMP inform, Flow Control, Back pressure flow control

Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMPv1/v2, GMRP, Static Multicast
Redundancy Protocols: STP/RSTP, MSTP, Turbo Ring v1/v2, Turbo Ring v2 with DRC, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Port Lock, Broadcast Storm Protection, Rate Limit
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (SW-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet: Front cabling, M12 D-coded 4-pin female connector, 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Console Port: M12 A-coded 5-pin male connector
Alarm Contact: 2 relay outputs in one M12 A-coded 5-pin male connector with current carrying capacity of 1 A @ 30 VDC

Power Requirements

Input Voltage: 24/36/48/72/96/110 VDC
Operating Voltage: 16.8 to 137.5 VDC
Input Current:
TN-5508A series: 0.28 A @ 24 VDC; 0.07 A @ 110 VDC
TN-5516A series: 0.39 A @ 24 VDC; 0.09 A @ 110 VDC
Overload Current Protection: Present
Connection: M23 connector
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Aluminium alloy
IP Rating: IP54 protection (optional protective caps available for unused ports)
Dimensions:
TN-5508A non-PoE Series: 185 x 175.8 x 76.0 mm (7.28 x 6.92 x 2.99 in)
TN-5516A non-PoE Series: 250 x 175.8 x 76.0 mm (9.84 x 6.92 x 2.99 in)
TN-5508A-8PoE Series: 185 x 175.8 x 115 mm (7.28 x 6.92 x 4.53 in)
TN-5516A-8PoE Series: 250 x 175.8 x 115 mm (9.84 x 6.92 x 4.53 in)
Weight:
TN-5508A non-PoE Series: 1,610 g (3.54 lb)
TN-5516A non-PoE Series: 2,138 g (4.71 lb)
TN-5508A-8PoE: 2,383 g (5.25 lb)
TN-5516A-8PoE: 3,286 g (7.24 lb)
Installation: Panel mounting, DIN-rail mounting (with optional kit: DK-DC50131)

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Altitude: 2,000 m
Note: Please contact Moxa if you require products guaranteed to function at higher altitudes

Standards and Certifications

Safety: UL/cUL 508, EN 60950-1 (LVD)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 ESD: Contact 6 kV; Air 8 kV
IEC 61000-4-3 RS: 20 V/m (80 MHz to 1 GHz)
IEC 61000-4-4 EFT: Power 2 kV; Signal 2 kV
IEC 61000-4-5 Surge: Power 2 kV; Signal 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Rail Traffic: (for panel mounting installations)
EN 50155 (essential compliance*), EN 50121-4, EN 50121-3-2, EN 45545-2
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
Shock: EN 50155, IEC 61373
Freefall: IEC 60068-2-32
Vibration: EN 50155, IEC 61373
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time:
TN-5508A non-PoE series: 814,964 hrs
TN-5516A non-PoE series: 722,721 hrs
TN-5508A-8PoE: 526,372 hrs
TN-5516A-8PoE: 483,246 hrs
Standard: Telcordia SR332

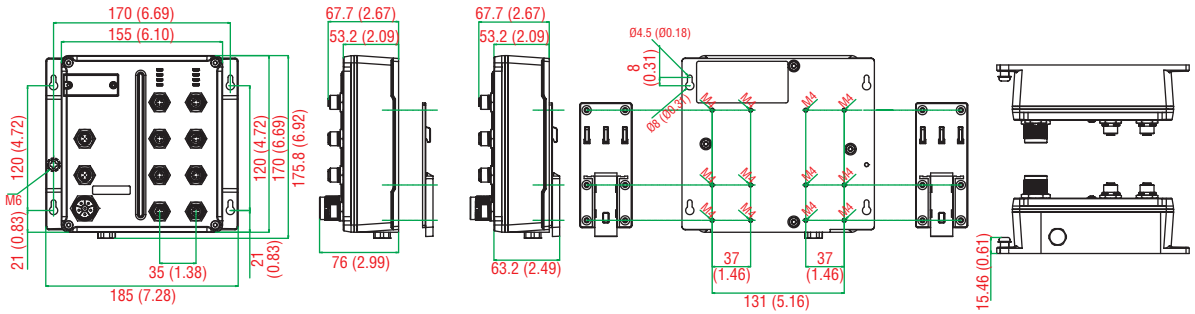
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

TN-5508A non-PoE Series

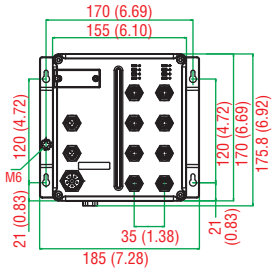


Front View | Side View (including DIN-Rail Mounting Kit) | DIN-Rail Mounting Kit | Rear View | Top & Bottom Views

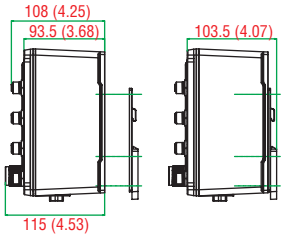
Dimensions

Unit: mm (inch)

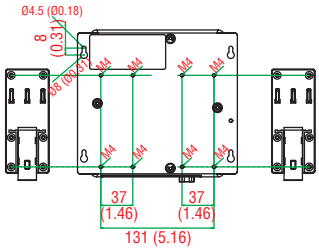
TN-5508A-8PoE Series



Front View

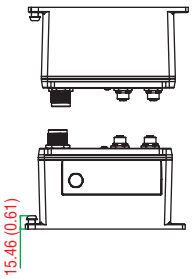


Side View (including DIN-Rail)



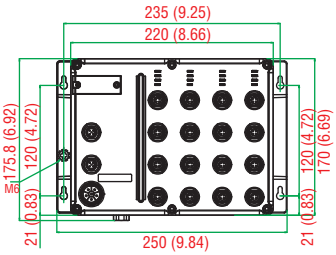
DIN-Rail Mounting Kit

Rear View

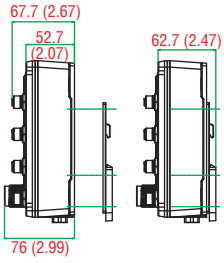


Top & Bottom Views

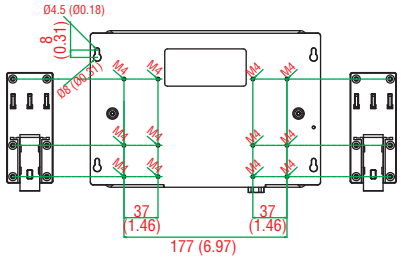
TN-5516A non-PoE Series



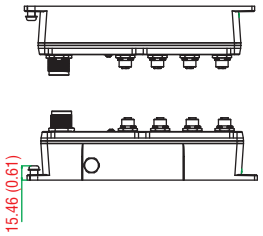
Front View



Side View (including DIN-Rail Mounting Kit)



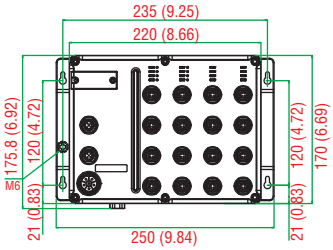
Rear View



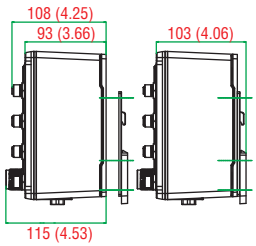
DIN-Rail Mounting Kit

Top & Bottom Views

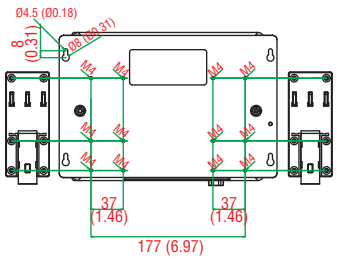
TN-5516A-8PoE Series



Front View

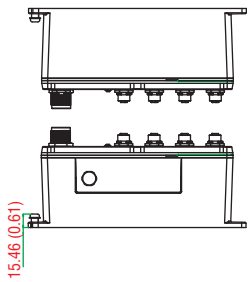


Side View (including DIN-Rail)



DIN-Rail Mounting Kit

Rear View



Top & Bottom Views

Ordering Information

Available Models	Port Interface		Power Supply	Conformal Coating
Wide Temperature (-40 to 75°C)	PoE, 10/100BaseT(X), M12 connector	10/100BaseT(X), M12 connector	WV: 24 to 110 VDC (16.8 to 137.5 VDC)	
TN-5508A Series				
TN-5508A-WV-T	–	8	Dual Input	–
TN-5508A-WV-CT-T	–	8	Dual Input	✓
TN-5516A Series				
TN-5516A-WV-T	–	16	Dual Input	–
TN-5516A-WV-CT-T	–	16	Dual Input	✓
TN-5508A-8PoE Series				
TN-5508A-8PoE-WV-T	8	–	1	–
TN-5508A-8PoE-WV-CT-T	8	–	1	✓
TN-5516A-8PoE Series				
TN-5516A-8PoE-WV-T	8	8	1	–
TN-5516A-8PoE-WV-CT-T	8	8	1	✓

Optional Accessories (can be purchased separately)

Power Cords, M12 Connectors, Protective Caps: See the EN 50155 Switch Accessories datasheet for details
MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01-M12: Configuration backup and restoration tool for TN series managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- TN-5500A switch
- 2 protective caps for console and relay output ports
- Panel mounting kit
- Hardware installation guide
- Warranty card

TN-5308 Series

EN 50155 8-port unmanaged Ethernet switches

- M12 connectors and IP40 metal housing
- Supports IEEE 802.3/802.3u/802.3x
- Essential compliance with EN 50155*
- -40 to 75°C operating temperature range (T models)

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

EN 50155 EN 50121

Introduction

The ToughNet TN-5308 series M12 unmanaged Ethernet switches are designed for industrial applications in harsh environments. The TN series switches use M12 connectors to ensure tight, robust connections, and guarantee reliable operation against environmental disturbances, such as vibration and shock. The TN-5308 series Ethernet switches provide 8 Fast Ethernet M12 ports, support IEEE 802.3/802.3u/802/3x with 10/100M, full/half-duplex, MDI/MDI-X auto-sensing, and provide an economical solution for your industrial Ethernet network. Models with an extended operating temperature range of -40 to 75°C are also available. The TN-5308 series Ethernet switches comply with those EN 50155 requirements that make products more suitable for rolling stock applications, including operating temperature, power input voltage, surge, ESD, and vibration, making the switches suitable for a variety of industrial applications.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control
Processing Type: Store and Forward

Interface

M12 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode and auto MDI/MDI-X connection

Power Requirements

Input Voltage:
• TN-5308-LV: 12/24/36/48 VDC
• TN-5308-MV: 72/96/110 VDC
Note: Compliant with EN 50155 on 24/48/72/96/110 VDC
Operating Voltage:
• TN-5308-LV: 8.4 to 60 VDC
• TN-5308-MV: 50.4 to 137.5 VDC
Input Current:
• TN-5308-LV: 0.19 A @ 12 VDC, 0.10 A @ 24 VDC, 0.054 A @ 48 VDC
• TN-5308-MV: 0.033 A @ 72 VDC, 0.024 A @ 96 VDC, 0.021 A @ 110 VDC
Connection:
• TN-5308-LV: M12 connector
• TN-5308-MV: M23 connector
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal
IP Rating: IP40 protection
Dimensions:
TN-5308-LV: 60 x 216.6 x 36.1 mm (2.36 x 8.53 x 1.42 in)
TN-5308-MV: 60 x 216.6 x 53.8 mm (2.36 x 8.53 x 2.12 in)
Weight:
TN-5308-LV: 485 g (1.07 lb)
TN-5308-MV: 685 g (1.51 lb)
Installation: Panel mounting, DIN-rail mounting (with optional kit: DK-TN-5308)

Environmental Limits

Operating Temperature:
Standard Models: -25 to 60°C (-13 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL/cUL 508, EN 60950-1 (LVD)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Rail Traffic: (for panel mounting installations)
EN 50155 (essential compliance*), EN 50121-4, EN 45545-2
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
Shock: EN 50155, IEC 61373
Freefall: IEC 60068-2-32
Vibration: EN 50155, IEC 61373
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time:
TN-5308-LV Series: 2,099,286 hrs
TN-5308-MV Series: 2.590.858 hrs
Standard: Telcordia SR332

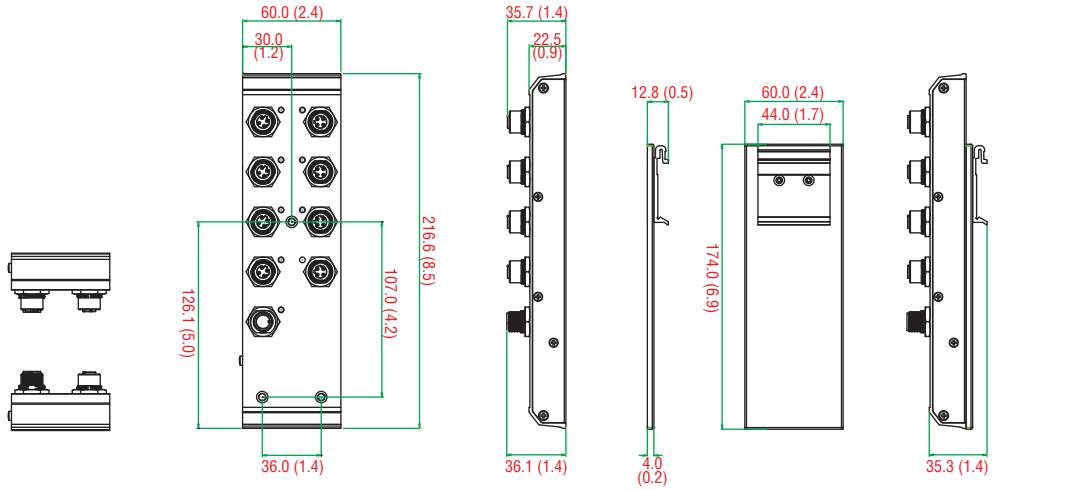
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

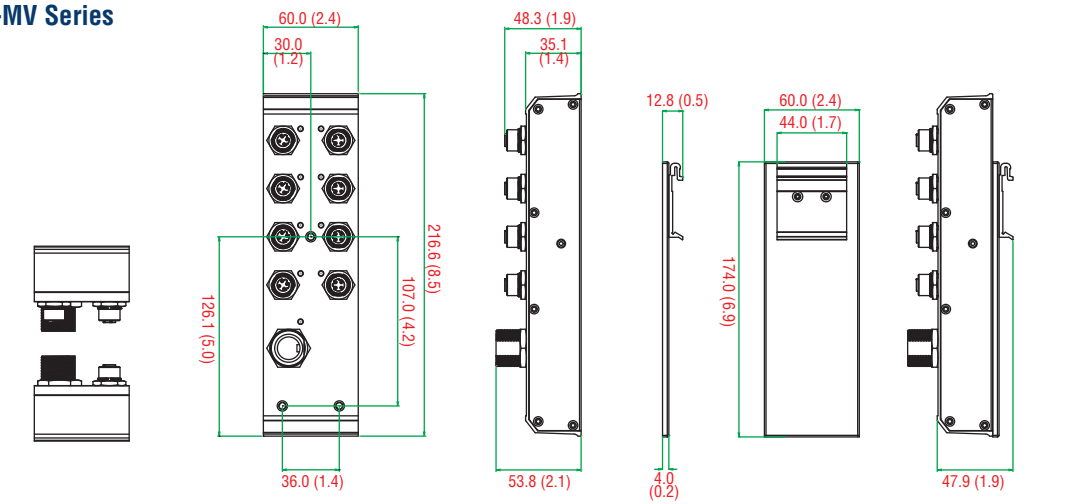
Unit: mm (inch)

TN-5308-LV Series



Top & Bottom Views | Front View | Side View | DIN-Rail Mounting Kit | Side View (including DIN-Rail)

TN-5308-MV Series



Top & Bottom Views | Front View | Side View | DIN-Rail Mounting Kit | Side View (including DIN-Rail)

Ordering Information

Available Models		Power Interface	Power Supply	
Standard Temperature (-25 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X), M12 connector	LV	MV
			12/24/36/48 VDC (8.4 to 60 V)	72/96/110 VDC (50.4 to 137.5 V)
TN-5308-LV	TN-5308-LV-T	8	1	–
TN-5308-MV	TN-5308-MV-T	8	–	1

Note: Conformal coating is available on request.

Package Checklist

- TN-5308 switch
- Panel-mounting kit
- Hardware installation guide
- Warranty card

Optional Accessories (can be purchased separately)

Power Cords, M12 Connectors, Protective Caps: See the EN 50155 Switch Accessories datasheet for details
DK-TN-5308: DIN-rail mounting kit

TN-5308-4/8PoE Series

EN 50155 8-port unmanaged Ethernet switches with 4/8 PoE ports

- 4 or 8 IEEE 802.3af compliant PoE and Ethernet combo ports
- Provides up to 15.4 watts at 48 VDC per PoE port
- Complies with a portion of EN 50155 specifications
- -40 to 75°C operating temperature range (T models)

EN 50121

Introduction

The ToughNet TN-5308-4/8PoE series M12 unmanaged Ethernet switches are designed for industrial applications in harsh environments. The M12 connectors ensure tight, robust connections, and guarantee reliable operation, even for applications that are subject to high vibration and shock. The TN-5308-4/8PoE series Ethernet switches provide 8 Fast Ethernet M12 ports with 4/8 IEEE 802.3af compliant PoE (Power-over-Ethernet) ports. The switches are classified as power source equipment (PSE) and provide up to 15.4 watts of power per port.

The TN-5308-4/8PoE switches can be used to power IEEE 802.3af compliant powered devices (PDs), eliminating the need for additional wiring. The switches support IEEE 802.3/802.3u/802/3x with 10/100M, full/half-duplex, MDI/MDI-X auto-sensing, and provide an economical solution for your industrial Ethernet network. Models with an extended operating temperature range of -40 to 75°C are also available. The TN-5308-4/8 PoE series Ethernet switches comply with a portion of EN 50155 specifications, covering operating temperature, power input voltage, surge, ESD, and vibration, making the switches suitable for a variety of industrial applications.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control
IEEE 802.3af for Power-over-Ethernet
Processing Type: Store and Forward

Interface

M12 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode and auto MDI/MDI-X connection

Power Requirements

Input Voltage: 48 VDC
Operating Voltage: 46 to 50 V
Input Current:
• TN-5308-4PoE: 1.6 A @ 48 VDC
• TN-5308-8PoE: 2.9 A @ 48 VDC
Overload Current Protection: 3 A @ 48 VDC
Connection: M12 connector
Reverse Polarity Protection: 3 A @ 48 VDC

PoE (per port)

Max. Output Power: 15.4 W
Output Voltage: 44 to 48.5 VDC
Max. Output Current: 350 mA
Max. Overload Protection: 400 mA

Physical Characteristics

Housing: Metal
IP Rating: IP40 protection
Dimensions:
TN-5308-4PoE: 60 x 216.6 x 48.7 mm (2.36 x 8.53 x 1.91 in)
TN-5308-8PoE: 80 x 216.6 x 52.9 mm (3.15 x 8.53 x 2.1 in)
Weight:
TN-5308-4PoE: 675 g (1.49 lb)
TN-5308-8PoE: 970 g (2.14 lb)
Installation: Panel mounting, DIN-rail mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: -25 to 60°C (-13 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL/cUL 508, EN 60950-1 (LVD)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 ESD: Contact 6 kV; Air 8 kV
IEC 61000-4-3 RS: 20 V/m (80 MHz to 1 GHz)
IEC 61000-4-4 EFT: Power 2 kV; Signal 2 kV
IEC 61000-4-5 Surge: Power 2 kV; Signal 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Rail Traffic: (for panel mounting installations)
EN 50155*, EN 50121-4, EN 45545-2
*Complies with a portion of EN 50155 specifications.
Shock: EN 50155, IEC 61373
Freefall: IEC 60068-2-32
Vibration: EN 50155, IEC 61373
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time:
TN-5308-4PoE-48 Series: 252,075 hrs
TN-5308-8PoE-48 Series: 308,392 hrs
Standard: Telcordia SR332

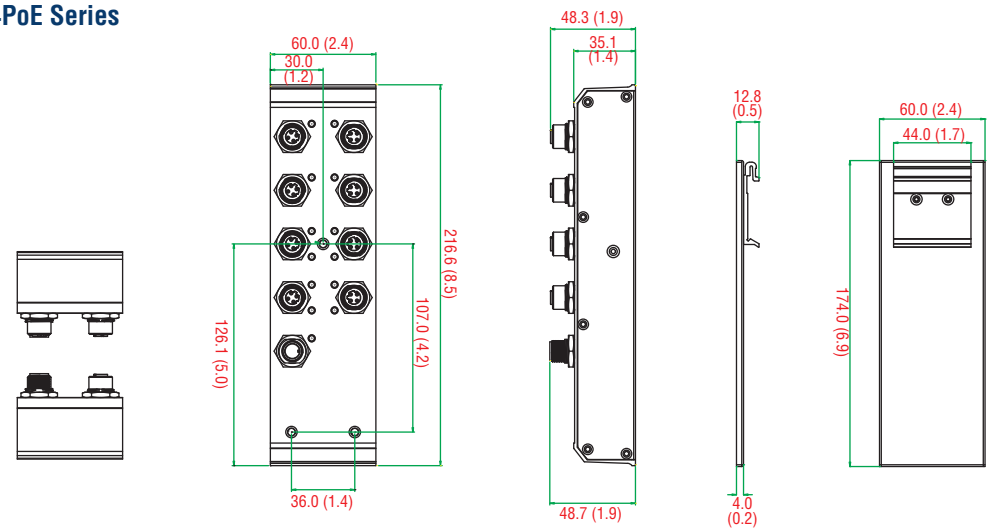
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

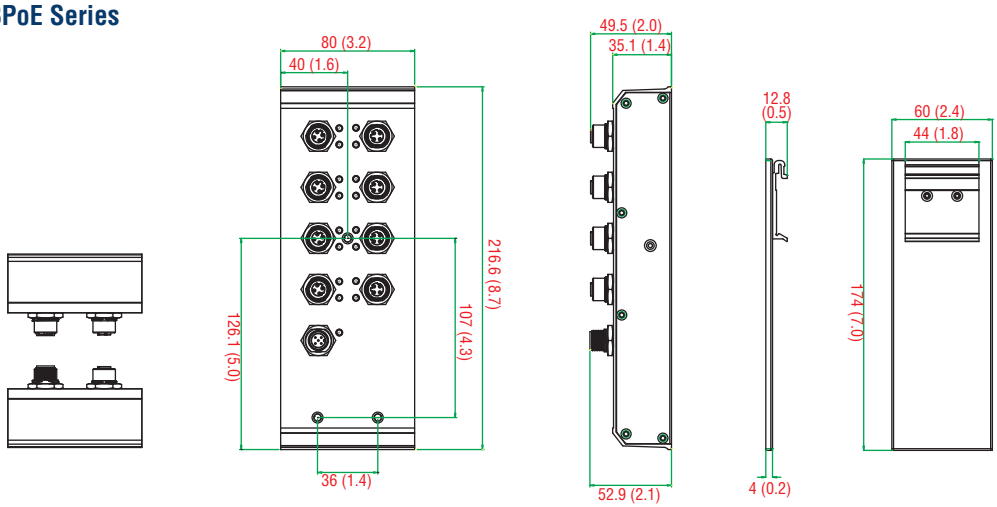
Unit: mm (inch)

TN-5308-4PoE Series



Top & Bottom Views | Front View | Side View | DIN-Rail Mounting Kit

TN-5308-8PoE Series



Top & Bottom Views | Front View | Side View | DIN-Rail Mounting Kit

Ordering Information

Available Models		Port Interface	
Standard Temperature (-25 to 60°C)	Wide Temperature (-40 to 75°C)	PoE, 10/100BaseT(X), M12 connector	10/100BaseT(X), M12 connector
TN-5308-4PoE-48	TN-5308-4PoE-48-T	4	4
TN-5308-8PoE-48	TN-5308-8PoE-48-T	8	0

Note: Conformal coating is available on request.

Package Checklist

- TN-5308-4/8PoE switch
- Hardware installation guide
- Warranty card

Optional Accessories (can be purchased separately)

Power Cords, M12 Connectors, Protective Caps: See the EN 50155 Switch Accessories datasheet for details
DR-75-48/120-48: 75/120 W DIN-rail 48 VDC power supplies

TN-5305 Series

EN 50155 5-port IP67 unmanaged Ethernet switches

- 10/100BaseT(X), 4-pin M12 (D-coded), F/H duplex mode, and auto MDI/MDI-X connection
- IP67 rated housing protection
- Power input: 12 to 45 VDC, 18 to 30 VAC
- Complies with a portion of EN 50155 specifications
- -40 to 75°C operating temperature range (T models)

Introduction

The TN-5305 series Ethernet switches are IP67-rated for tough industrial applications. By using M12 connectors, you can rest assured that Ethernet cables will connect tightly to the switch, and will be robust enough to protect your applications from external disturbances, such as the vibration and shock encountered in the transportation industry. The space-saving TN-5305 switches can be mounted virtually anywhere, and wide operating temperature (-40 to 75°C) models are also available for use in the most extreme weather conditions. The TN-5305 Series Ethernet switches comply with a portion of EN 50155 specifications, covering operating temperature, power input voltage, surge, ESD, and vibration, making the switches suitable for a variety of industrial applications.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control
Processing Type: Store and Forward

Software Features

Processing Type: Store and Forward

Interface

M12 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection

Power Requirements

Input Voltage:
• 24 VDC
• 18 to 30 VAC (47 to 63 Hz)
Note: Compliant with EN 50155 on 24 VDC
Operating Voltage:
• 12 to 45 V
• 18 to 30 VAC (47 to 63 Hz)
Input Current:
• 0.12 A @ 24 VDC
• 0.28 A @ 24 VAC
Overload Current Protection: 1.1 A (Limited Current)
Connection: 1 M12 socket (A-coded), single power input
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Plastic
IP Rating: IP67 protection
Dimensions: 60 x 125 x 29.6 mm (2.36 x 4.92 x 1.09 in)
Weight: 250 g (0.56 lb)
Installation: Field-style mounting, DIN-rail mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: -25 to 60°C (-13 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL/cUL 508
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Rail Traffic: EN 50155* (for panel-mounting installations)
*Complies with a portion of EN 50155 specifications.
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

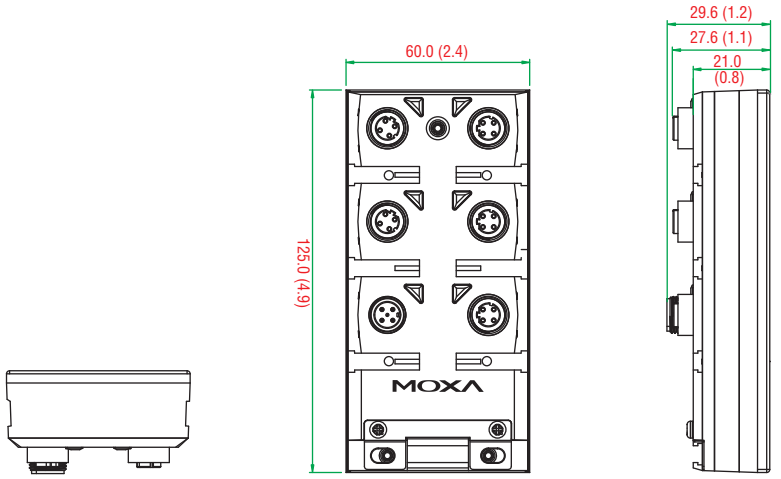
Time: 370,224 hrs
Standard: Telcordia SR332

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Top View | Front View | Side View

Ordering Information

Available Models		Port Interface
Standard Temperature (-25 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X), M12 connector
TN-5305	TN-5305-T	5

Note: Conformal coating is available on request.

Optional Accessories (can be purchased separately)

Power Cords, M12 Connectors, Protective Caps: See the EN 50155 Switch Accessories datasheet for details

DK-TN-5308: DIN-rail mounting kit

Package Checklist

- TN-5305 switch
- Panel-mounting kit
- 3 protective caps for unused ports and 8 port labels
- Hardware installation guide
- Warranty card

EN 50155 Switch Accessories

M12/M23 Cords

CBL-M12D(MM4P)/RJ45-100 IP67

1-meter M12-to-RJ45 Cat-5C UTP Ethernet cable with
IP67-rated 4-pin male D-coded M12 connector

CBL-M12(FF5P)/OPEN-100 IP67

1-meter M12-to-5-pin power cable with IP67-rated
5-pin female A-coded M12 connector

CBL-M23(FF6P)/Open-BK-100 IP67

1-meter M23-to-6-pin power cable with
IP67-rated 6-pin female M23 connector

CBL-M12XMM8PRJ45-Y-200-IP67

2-meter M12-to-RJ45 Cat-5 UTP Ethernet cable with
IP67-rated 8-pin male X-coded crimp type M12 connector

CBL-M12XMM8P-Y-300-IP67

3-meter M12-to-M12 Cat-5 UTP Ethernet cable with
IP67-rated 8-pin male X-coded crimp type M12 connector

CBL-M12XMM8P-Y-100-IP67

1-meter M12-to-M12 Cat-5 UTP Ethernet cable with
IP67-rated 8-pin male X-coded crimp type M12 connector

M12 Connectors

M12D-4P-IP68

Field-installable M12 D-coded screw-in
sensor connector, 4-pin male, IP68-rated

M12A-5P-IP68

Field-installable M12 A-coded screw-in
sensor connector, 5-pin female, IP68-rated

M12X-8PMM-IP67-HTG

Field-installable M12 X-coded crimp type,
slim design connector, 8-pin male, IP67-rated

M12 IP67 Protective Caps

A-CAP-M12F-M

Metal cap for M12 female connector

A-CAP-M12M-M

Metal cap for M12 male connector

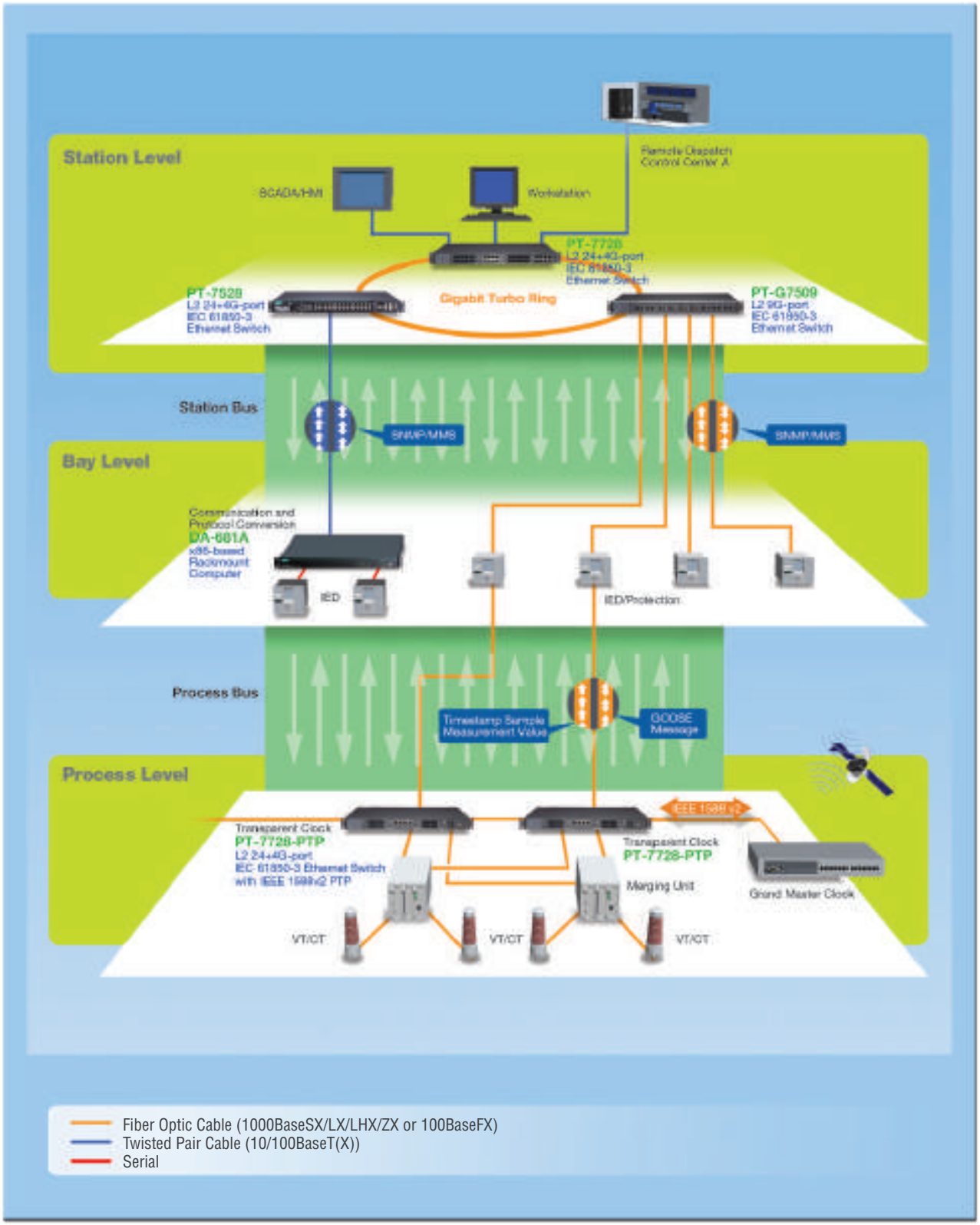
M23 Connectors

A-PLG-WPM23-01

M23 cable connector, 6-pin female, crimp type

Introduction to IEC 61850-3 Ethernet Switches

Suitable for All Demanding Power Utility Applications



IEC 61850 Makes Substations Smarter

The end goal of IEC 61850 is to transform the electricity distribution industry by building more intelligence and more complete automation into power substations. With intelligent electronic devices (IEDs), it's possible to extend new controls and automation deep into the substation's process layer, thus allowing for real-time monitoring and management from a centralized remote control hub.

According to IEC 61850, an intelligent substation is characterized by these three basic features:

- All primary substation machinery (switchgear, transformers) are engineered with a relatively high level of device intelligence.
- All secondary devices are networked.
- All routine operations and system management are fully automated.

To meet these objectives, the IEC 61850 standard stipulates that power substations will use Ethernet switches for data communications all throughout the station, bay, and process levels. Because commercial devices are far too frail for the demanding conditions of a power substation environment, devices specifically engineered to heavy industrial standards (e.g. IEC 61850-3 and IEEE 1613 requirements) which are optimized for use in power substations will be required.

Certifications to Ensure Reliable Operation

IEC 61850-3

IEC 61850-3 specifically addresses the device's electromagnetic immunity from certain environmental conditions and electromagnetic interference (EMI) for communication networks and systems in substations. The EMI immunity requirements are based on IEC 61000-6-5, which establishes performance criteria for key functions within the substation. To be compliant with the standard, critical functions, such as protection relay and control functions, on-line processing and regulation, as well as metering and network communication, cannot experience delays or data loss when exposed to various EMI phenomena.

IEEE 1613

IEEE 1613 is another industry standard that establishes EMI immunity requirements for networking devices in electric power substations. Included in this standard are ratings, environmental performance requirements, and testing requirements for compliant communication devices.

According to the IEEE 1613 standard, compliant devices may not experience permanent damage under EMI stress. Two different classes of devices are defined in the standard according to how EMI stress affects performance.

Class 1

Compliant devices in this class may experience some data errors, losses, or delays under EMI stress conditions.

Class 2

Compliant devices in this class must not experience any data errors, delays, or losses under EMI stress conditions.

The PowerTrans (PT) series is compliant with IEC 61850-3 and IEEE 1613 certifications specifying a high level of EMC, shock, and vibration in power substations.

Maximizing Substation System Availability

Maximizing a power substation's availability and safety is the ultimate goal for both transmission grid operators and Substation Automation System (SAS) integrators. A properly optimized SAS will help ensure that the substation's operation is always well within what are considered safe conditions.

Overall, a power substation's daily operation can be classified into three states:

State 1: When the system is healthy and working properly.

State 2: When the system encounters errors that reduce availability and/or make it unsafe.

State 3: When a State 2 error has been detected and measures are being taken to make the system available again, by returning it to State 1.

The foremost concern for electricity suppliers is substation availability, that is, keeping the operation in State 1 as much as possible. The following guidelines address every aspect of the design and operation substation networks:

- Minimize Error Probability: Cut the possibility for errors in any way possible.
- Detect Errors Faster: Increase the speed at which errors are detected, thereby minimizing interruptions to the smallest possible window.
- Optimize Error Repairability: Increase the efficiency and effectiveness of fixing substation failures.

Minimize Error Probability

PRP/HSR Standardized Protocols for Zero Recovery Time

IEC 62439-3 Clause 4 defines "Parallel Redundancy Protocol" (PRP) and IEC 62439-3 Clause 5 defines "High-availability Seamless Redundancy" (HSR). PRP and HSR are the newest standardized redundancy protocols for industrial automation networks where zero recovery time is needed. These protocols are suitable for electrical substation automation or mission-critical applications that cannot tolerate any system downtime.

Moxa's integrated PRP/HSR technology provides the following benefits:

- Full compliance with the latest international IEC 62439-3 standard for highest stability and interoperability
- PRP and HSR in a single box to give you a choice for improving reliability
- 100/1000 Mbps transmission speed across a combination of PRP/HSR/InterLink ports
- Support for hardware-based IEEE 1588v2 PTP

Noise Guard™: Wire-Speed Zero Packet Loss Technology

To meet IEEE 1613 Class 2 requirements, network devices must have a level 4 EMC rating to guarantee that they will reliably tolerate high EMI conditions.

- Mechanical Design: Integrated housing for better conduction
- Customized Component: Newly redesigned fiber transceiver
- Enhanced Power Supply Unit: Optimized circuit design, upgraded components

IEC 61850 QoS

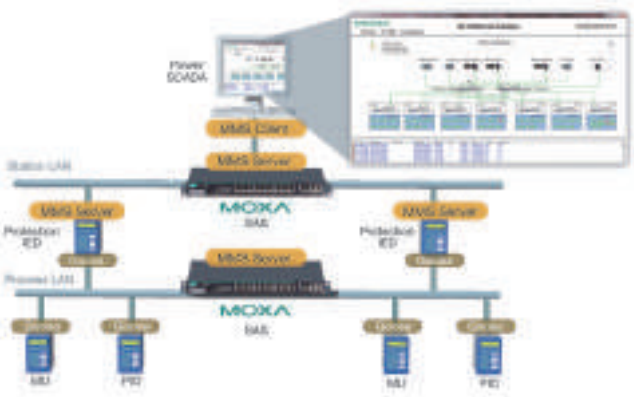
Substation automation devices must communicate critical, low-level IEC 61850 multicasts (GOOSE/SMV) with the highest priority, without fail. Prioritizing the transmission of GOOSE/SMV packets guarantees that these messages are clearly received without distortion throughout the entire network, regardless of what other communications may be currently congesting the lines. Ping-based solutions are not sufficient to achieve this. To fully satisfy IEEE 1613 Class 2 requirements, substation switches must support strong QoS traffic shaping.

- Communications packets may be assigned different priorities, depending on their importance
- Packet types: GOOSE, SMV, PTP
- Packet priorities: High, medium, normal, low

Detect Errors Faster

IEC 61850-90-4 Modeling Switch for Power SCADA

Moxa's PowerTrans PT-7528 substation Ethernet switches come with fully integrated MMS support. PT-7528 IEC 61850-90-4 switches give substation engineers the option of bringing their IT devices into the same SCADA overview as the IEDs, or any other IEC 61850 device that uses MMS as its device-to-device messaging model.



Fiber Check™: A Fiber Digital Diagnostic Monitoring (DDM) Tool

Using Fiber Check™, a fiber Digital Diagnostic Monitoring (DDM) tool, Moxa's IEC 61850 certified substation switches can monitor ST/SC (as well as SFP) connectors, and notify power SCADA systems via SNMP trap or MMS when abnormalities are detected, allowing operators to initiate maintenance procedures. Fiber Check™ reports and alarms may be communicated via web, CLI, or serial console; via MMS reporting or SNMP traps; by a digital relay; or in the system log. Preferably, several methods will be used to provide redundancy. This arrangement further allows system operators real time monitoring of things like transmission and reception power, temperature, and voltage/current along optical fiber connections.

- Fiber status monitoring: Fiber temperature, working voltage, Tx/Rx power
- Auto-warning: SNMP trap, relay, email, MMS, event log

Optimize Error Repairability

Substation Configuration Wizard

Because substations are such a specialized environment, IT setups will only require a few key features. Thus, simplifying and streamlining the configuration process makes a lot of sense: by reducing the configuration interface to only the relevant network features, setup and maintenance becomes much more efficient. Using Moxa's browser-based configuration wizard, effectively deploying one of our network devices can take as few as 7 steps.

PT-7828 Series

IEC 61850-3 / EN 50155 24+4G-port Layer 3 Gigabit modular managed rackmount Ethernet switches

- IEC 61850-3, IEEE 1613 (power substations) and EN 50121-4 (railway applications) compliant
- Complies with a portion of EN 50155 specifications
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- Up to 12 ports with M12 connectors
- Isolated redundant power supplies with universal 24 VDC, 48 VDC, or 110/220 VDC/VAC power supply range
- Supports multicast routing protocols PIM-DM/DVMRP
- -40 to 85°C operating temperature range

Introduction

The PowerTrans PT-7828 switches are high performance Layer 3 Ethernet switches that support Layer 3 routing functionality to facilitate the deployment of applications across networks. The PT-7828 switches are also designed to meet the strict demands of power substation automation systems (IEC 61850-3, IEEE 1613), and railway applications (EN 50121-4). The PT-7828 series also features critical packet prioritization (GOOSE, SMVs, and PTP).

The PT-7828's Gigabit and Fast Ethernet backbone, redundant ring, and 24 VDC, 48 VDC, or 110/220 VDC/VAC dual isolated redundant power supplies increase the reliability of your communications and save on cabling and wiring costs. The modular design of the PT-7828 makes network planning easy, and allows greater flexibility by letting you install up to 4 Gigabit ports and 24 Fast Ethernet ports. Optional front or rear wiring makes the PT-7828 switches suitable for a variety of applications.

General Features and Benefits

- Layer 3 switching functionality to divide a large network into hierarchical subnets and allow data and information to communicate across networks
- Command Line Interface (CLI) for quickly configuring major managed functions
- Software-based IEEE 1588v2 PTP (Precision Time Protocol) for time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- EtherNet/IP and Modbus/TCP industrial Ethernet protocols supported
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- Supports multicast routing protocols PIM-DM/DVMRP
- Supports advanced VLAN capability with Q-in-Q tagging
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- Bandwidth management prevents unpredictable network status
- Multi-port mirroring for online debugging
- Automatic warning by exception through email, relay output
- RMON for efficient network monitoring and proactive capability
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by web browser, Telnet/serial console, CLI Windows utility, and ABC-01 automatic backup configurator

Cybersecurity Features

- User passwords with multiple levels of security protect against unauthorized configuration
- SSH/HTTPS is used to encrypt passwords and data
- Lock switch ports with 802.1X port-based network access control so that only authorized clients can access the port
- Disable one or more ports to block network traffic
- 802.1Q VLAN allows you to logically partition traffic transmitted between selected switch ports
- Secure switch ports so that only specific devices and/or MAC addresses can access the ports
- RADIUS/TACACS+ allows you to manage passwords from a central location
- SNMPv3 provides encrypted authentication and access security

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1s for Multiple Spanning Tree Protocol

Layer 3 Modular Rackmount Ethernet Switch System, PT-7828

IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Software Features

Management: IPv4/IPv6, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, DHCP Option 66/67/82, LLDP, Flow Control, Back Pressure Flow Control, SNMP Inform, Port Mirror, Syslog
Filter: IGMPv1/v2/v3, GMRP, GVRP, 802.1Q, Q-in-Q VLAN
Redundancy Protocols: STP/RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation, VRRP
Security: RADIUS, TACACS+, SSL, SSH, Port Lock, Broadcast Storm Protection
Unicast Routing: Static routing, RIP V1/V2, OSPF
Multicast Routing: DVMRP and PIM-DM
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Groups 1, 2, 3, 9
Power Substation: IEC 61850 QoS

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet: Slots 1, 2, and 3 for combinations of 2, 4, 6, or 8-port PM-7200 Fast Ethernet modules with 10/100BaseT(X) (TP/M12 interface), 100BaseFX (SC/ST/MTRJ connector), or 100BaseSFP
Gigabit Ethernet: Slot 4 for 2 or 4-port PM-7200 Gigabit Ethernet combo module, 10/100/1000BaseT(X) or 1000BaseSFP
Console Port: RS-232 (RJ45)
Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Power Requirements

Input Voltage:
• 24 VDC
• 48 VDC
• 110/220 VDC/VAC
Operating Voltage:
• 18 to 36 V (24 VDC)
• 36 to 72 V (48 VDC)
• 88 to 300 VDC, 85 to 264 VAC (110/220 VDC/VAC)
Input Current: (all ports are equipped with fiber)
• Max. 2.38 A @ 24 VDC
• Max. 1.12 A @ 48 VDC
• Max. 0.59/0.30 A @ 110/220 VDC
• Max. 0.49/0.26 A @ 110/220 VAC
Overload Current Protection: Present
Connection: 10-pin terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Aluminum alloy
IP Rating: IP30 protection
Dimensions: 440 x 44 x 325 mm (17.32 x 1.73 x 12.80 in)
Weight: 5900 g (13.11 lb)
Installation: 19-inch rack mounting

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F), cold start requires min. of 100 VAC at -40°C
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 60950-1
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 35 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
IEC 61000-4-11
Rail Traffic: EN 50155*, EN 50121-4
Note: Please check Moxa's website for the most up-to-date certification status.
Transportation: NEMA TS2
Electrical Substation: IEC 61850-3, IEEE 1613

MTBF (mean time between failures)

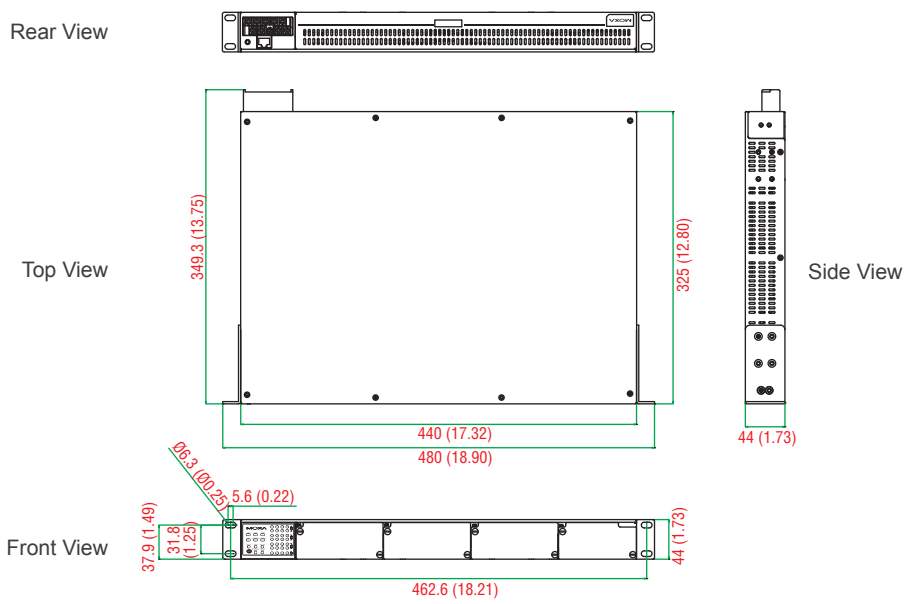
Time: 393,828 hrs
Standard: Telcordia SR332

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Step 1: Select Ethernet switch system

PT-7828 with power supply

Step 2: Select interface modules

PM-7200 module (Gigabit or Fast Ethernet)

Note: The PT-7828 Ethernet switch system is delivered without interface modules. See the PM-7200/7500 Series datasheet to choose PM-7200 interface modules.

PT-7828 Layer 3 Modular Rackmount Ethernet Switch System

The PT-7828 switch system consists of 16 Layer 3 modular managed rackmount Ethernet switch systems, each with 3 slots for Fast Ethernet modules, and 1 slot for a Gigabit Ethernet module. A total of 28 or 24+4G ports can be installed, and the switch can be used in temperatures ranging from -40 to 85°C.

Available Models		Power Supply					
		Isolated Power Supply 1			Isolated Power Supply 2		
Front Cabling, Front Display	Rear Cabling, Front Display	24 VDC	48 VDC	HV: 110/220 VDC/VAC	24 VDC	48 VDC	HV: 110/220 VDC/VAC
PT-7828-F-24	PT-7828-R-24	1	–	–	–	–	–
PT-7828-F-24-24	PT-7828-R-24-24	1	–	–	1	–	–
PT-7828-F-24-HV	PT-7828-R-24-HV	1	–	–	–	–	1
PT-7828-F-48	PT-7828-R-48	–	1	–	–	–	–
PT-7828-F-48-48	PT-7828-R-48-48	–	1	–	–	1	–
PT-7828-F-48-HV	PT-7828-R-48-HV	–	1	–	–	–	1
PT-7828-F-HV	PT-7828-R-HV	–	–	1	–	–	–
PT-7828-F-HV-HV	PT-7828-R-HV-HV	–	–	1	–	–	1

Note: The PT-7828 Layer 3 Ethernet switch systems provide combinations of 1 slot for a Gigabit Ethernet interface module, 3 slots for Fast Ethernet interface modules. See the PM-7200/7500 Series datasheet to select PM-7200 Gigabit Ethernet and Fast Ethernet interface modules for your own application.

PT-7828-F series
(Front Cabling, Front Display)

PT-7828-R series
(Rear Cabling, Front Display)

Gigabit/Fast Ethernet Modules for the PT-7828

	Interface Modules																						
	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-2MSC	PM-7200-2MST	PM-7200-2SSC	PM-7200-8TX	PM-7200-2MSC4TX	PM-7200-2MST4TX	PM-7200-2SSC4TX	PM-7200-4MSC2TX	PM-7200-4MST2TX	PM-7200-4SSC2TX	PM-7200-6MSC	PM-7200-6MST	PM-7200-6SSC	PM-7200-8SFP	PM-7200-4M12	PM-7200-8MTRJ	PM-7200-4TX-PTP	PM-7200-4MST-PTP	PM-7200-4MSC-PTP	PM-7200-1BNO2MST-PTP
Slot 1	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–
Slot 2	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–
Slot 3	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–
Slot 4	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01 Series: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- PT-7828 switch
- Serial Cable: CN20070
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide
- Warranty card

PT-7728-PTP Series

IEC 61850-3 Layer 2 IEEE 1588v2 PTP rackmount (PRP/HSR) Ethernet switches

- IEEE 1588v2 PTP with hardware time stamping for precise time synchronization of networks
- IEC 61850-3 and IEEE 1613 (power substations) compliant
- IEC 62439-3 Clause 4 (PRP) and Clause 5 (HSR) compliant*
- Isolated redundant power supplies with universal 24 VDC, or 48 VDC, or 110/220 VDC/VAC power supply range
- -40 to 85°C operating temperature range
- Built-in MMS server based on IEC 61850-90-4 switch data modeling for Power SCADA

*Only available with PM-7200-4GTX-PHR-PTP and PM-7200-4GSFP-PHR-PTP modules

Introduction

The PowerTrans PT-7728-PTP switches are designed to meet the demands of power substation automation systems (IEC 61850-3, IEEE 1613). The PT-7728-PTP's redundant ring, and dual isolated redundant power supplies increase the reliability of your communications and save on cabling/wiring costs.

Moxa's PT-7728-PTP IEC 61850-3 Ethernet switches support the latest version of IEEE 1588 technology (IEEE 1588v2 PTP) to fulfill precision time synchronization requirements for protection and control applications. These Ethernet switches guarantee time-stamping accuracy within 1 μs for the IEC 61850 process layer. They can be configured for 1588 v2 Master, Boundary Clock, and Transparent Clock functionality.

When used with specific PM-7200 PRP/HSR series modules, the PT-7728-PTP series switches are compliant with the latest standardized redundancy protocols for industrial automation networks. IEC 62439-3 Clause 4 (Parallel Redundancy Protocol, PRP) and IEC 62439-3 Clause 5 (High-availability Seamless Redundancy, HSR) ensure the highest system availability and data integrity for mission-critical applications in electrical substations and/or process automation systems that require zero recovery time redundancy.

The modular design of the PT-7728-PTP also makes network planning easy, and allows greater flexibility by letting you install up to 14 IEEE 1588 Fast Ethernet ports or up to 24 non-IEEE 1588 Ethernet ports and 4 Gigabit (PRP/HSR)*ports. Along with a choice of either front or rear wiring, these features together make the PT-7728-PTP suitable for a variety of industrial applications.

* Only available with PM-7200 PRP/HSR series module

IEEE 1588 PTP Features

- IEEE 1588v2 PTP (Precision Time Protocol) with hardware time stamping for precise time synchronization of networks
- Support for both IEEE 1588 Boundary Clock and Transparent Clock
- Support for both End-to-End (2-step) and Peer-to-Peer (2-step) modes in Transparent Clock*
- High precision time accuracy (under 1 μs)

*Only available with PM-7200 PRP/HSR series modules.

General Features and Benefits

- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), and RSTP/STP for network redundancy
- PRP (Parallel Redundancy Protocol): Transmit or receive two independent active paths to/from different LANs simultaneously on a zero recovery time network.
- HSR (High-availability Seamless Redundancy): Every frame is duplicated and then transmitted in both directions of the HSR ring for zero switchover time.
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- Bandwidth management prevents unpredictable network status
- Multi-port mirroring for online debugging
- Automatic warning by exception through email, relay output
- RMON for efficient network monitoring and proactive capability
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by Web browser, Telnet/Serial console, CLI, Windows utility, and ABC-01 automatic backup configurator
- Built-in MMS server based on IEC 61850-90-4 switch data modeling for Power SCADA
- PRP (Parallel Redundancy Protocol)*: Transmit or receive two independent active paths to/from different LANs simultaneously on a zero recovery time network.
- HSR (High-availability Seamless Redundancy)*: Every frame is duplicated and then transmitted in both directions of the HSR ring to deliver zero switchover time.

*Only available with PM-7200 PRP/HSR series modules

Cybersecurity Features

- User passwords with multiple levels of security protect against unauthorized configuration
- SSH/HTTPS is used to encrypt passwords and data
- Lock switch ports with 802.1X port-based network access control so that only authorized clients can access the port
- Disable one or more ports to block network traffic
- 802.1Q VLAN allows you to logically partition traffic transmitted between selected switch ports
- Secure switch ports so that only specific devices and/or MAC addresses can access the ports
- SNMPv3 provides encrypted authentication and access security

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Software Features

Management: IPv4/IPv6, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SNMP Inform, LLDP, Flow Control, Back Pressure Flow Control, Port Mirror, Fiber Check, Syslog
Filter: IGMPv1/v2, GMRP, GVRP, 802.1Q, Q-in-Q VLAN
Redundancy Protocols: STP/RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation, PRP, HSR
Security: RADIUS, TACACS+, SSL, SSH, Port Lock, Broadcast Storm Protection
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (hardware-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9, IEC 62439-3 MIB
Power Substation: MMS, IEC 61850 QoS

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

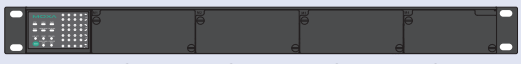
Interface

IEEE 1588 PTP: Up to 12 x 10/100BaseT(X), 12 x 100BaseFX (multi-mode, SC connector), or 14 x 100BaseFX (multi-mode, ST connector) and 4 x 10/100/1000BaseT(X) or 4 x 100/1000BaseSFP IEEE 1588 ports with hardware time stamping
Fast Ethernet:
• Slots 1, 2, and 3 for combinations of 2, 4, 6, or 8-port PM-7200 Fast Ethernet modules with 10/100BaseT(X) (TP/M12 interface), 100BaseFX (SC/ST/MTRJ connector), or 100BaseSFP
• Slot 4 for BNC port and 100BaseFX (ST connector)
Gigabit Ethernet: Slot 4 for 2 or 4-port PM-7200 Gigabit Ethernet combo module or 4-port PM-7200 Gigabit Ethernet PRP/HSR module, 10/100/1000BaseT(X) or 1000BaseSFP
Console Port: RS-232 (RJ45)
Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Power Requirements

Input Voltage:
• 24 VDC
• 48 VDC
• 110/220 VDC/VAC

Modular Rackmount Ethernet Switch System, PT-7728-PTP



Operating Voltage:
• 18 to 36 V (24 VDC)
• 36 to 72 V (48 VDC)
• 88 to 300 VDC, 85 to 264 VAC (110/220 VDC/VAC)
Input Current: (all ports are equipped with fiber)
• Max. 2.38 A @ 24 VDC
• Max. 1.12 A @ 48 VDC
• Max. 0.59/0.30 A @ 110/220 VDC
• Max. 0.49/0.26 A @ 110/220 VAC
Overload Current Protection: Present
Connection: 10-pin terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Aluminum alloy
IP Rating: IP30 protection
Dimensions: 440 x 44 x 325 mm (17.32 x 1.73 x 12.80 in)
Weight: 5900 g (13.11 lb)
Installation: 19-inch rack mounting

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F), cold start requires min. of 100 VAC at -40°C
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 60950-1, CSA C22.2 No. 60950-1, EN 60950-1
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 35 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
IEC 61000-4-11
Electrical Substation: IEC 61850-3, IEEE 1613
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

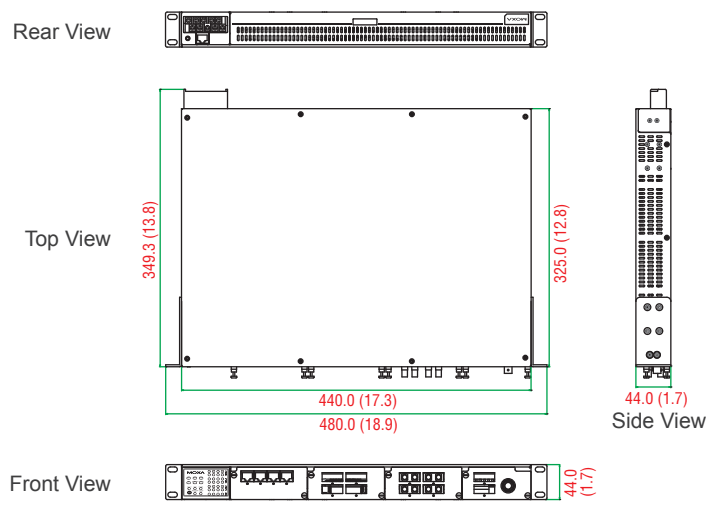
Time: 340,365 hrs
Standard: Telcordia SR332

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Step 1: Select Ethernet switch system

PT-7728-PTP with power supply

Step 2: Select interface modules

PM-7200 modules (Gigabit or Fast Ethernet)

Note: The PT-7728-PTP Ethernet switch system is delivered without interface module. See the PM-7200/7500 Series datasheet to choose PM-7200 interface modules.

PT-7728-PTP Modular Rackmount Ethernet Switch System

The PT-7728-PTP switch system consists of 14 modular managed rackmount Ethernet switch systems. A total of up to 14 IEEE 1588 Fast Ethernet ports or up to 24 non-IEEE 1588 Ethernet ports and 4 Gigabit ports can be installed, and the switch can be used in temperatures ranging from -40 to 85°C.

Available Models		Power Supply					
		Isolated Power Supply 1			Isolated Power Supply 2		
Front Cabling, Front Display	Rear Cabling, Front Display	24 VDC	48 VDC	HV: 110/220 VDC/VAC	24 VDC	48 VDC	HV: 110/220 VDC/VAC
PT-7728-PTP-F-24	PT-7728-PTP-R-24	1	–	–	–	–	–
PT-7728-PTP-F-24-24	PT-7728-PTP-R-24-24	1	–	–	1	–	–
PT-7728-PTP-F-24-HV	PT-7728-PTP-R-24-HV	1	–	–	–	–	1
PT-7728-PTP-F-48	PT-7728-PTP-R-48	–	1	–	–	–	–
PT-7728-PTP-F-48-48	PT-7728-PTP-R-48-48	–	1	–	–	1	–
PT-7728-PTP-F-HV	PT-7728-PTP-R-HV	–	–	1	–	–	–
PT-7728-PTP-F-HV-HV	PT-7728-PTP-R-HV-HV	–	–	1	–	–	1

Note: The PT-7728-PTP Ethernet switch systems provide combinations of 1 slot for a Gigabit Ethernet interface module, 3 slots for Fast Ethernet interface modules. See the PM-7200/7500 Series datasheet to select the PM-7200 Gigabit Ethernet and Fast Ethernet interface modules that you need for your own application.

PT-7728-PTP-F series
(Front Cabling, Front Display)

PT-7728-PTP-R series
(Rear Cabling, Front Display)

Gigabit/Fast Ethernet Modules for the PT-7728-PTP

	IEEE 1588 Interface Modules						non-IEEE 1588 Interface Modules																	
	PM-7200-4TX-PTP	PM-7200-4MST-PTP	PM-7200-4MSC-PTP	PM-7200-1BNC2MST-PTP	PM-7200-4GTX-PHR-PTP	PM-7200-4GSFP-PHR-PTP	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-2MSC	PM-7200-2MST	PM-7200-2SSC	PM-7200-8TX	PM-7200-2MSC4TX	PM-7200-2MST4TX	PM-7200-2SSC4TX	PM-7200-4MSC2TX	PM-7200-4MST2TX	PM-7200-4SSC2TX	PM-7200-6MSC	PM-7200-6MST	PM-7200-6SSC	PM-7200-8SFP	PM-7200-4M12	PM-7200-8MTRJ
Slot 1	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Slot 2	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Slot 3	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Slot 4	–	–	–	✓	✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01 Series: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- PT-7728-PTP switch
- Serial Cable: CN20070
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide
- Warranty card

PT-7528 Series

IEC 61850-3 28-port Layer 2 managed rackmount Ethernet switches

- IEC 61850-3, IEEE 1613 (power substations) compliant
- Built-in MMS server based on IEC 61850-90-4 switch data modeling for Power SCADA
- Noise Guard™ wire speed zero packet loss technology
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- Isolated redundant power supplies with universal 24/48 VDC or 110/220 VDC/VAC power supply range
- -40 to 85°C operating temperature range

Introduction

The PowerTrans PT-7528 series is designed for power substation automation applications that operate in extremely harsh environments. The PT-7528 series supports Moxa's Noise Guard technology, is compliant with IEC 61850-3, and its EMC immunity exceeds IEEE 1613 Class 2 standards to ensure zero packet loss while transmitting at wire speed. The PT-7528 series also features critical packet prioritization (GOOSE, SMVs, and PTP), a built-in MMS server, and a configuration wizard designed specifically for substation automation. With Gigabit Ethernet, redundant ring, and 110/220 VDC/VAC isolated redundant power supplies, the PT-7528 series further increases the reliability of your communications and saves cabling/wiring costs. The wide range of PT-7528 models available support multiple types of port configuration, with up to 28 copper or 24 fiber ports, and with up to 4 Gigabit ports. Taken together, these features allow greater flexibility, making the PT-7528 suitable for a variety of industrial applications.

General Features and Benefits

- Built-in MMS server for integration with power SCADA systems
- Switch data modeling based on the IEC 61850-90-4 standard
- Fiber Check™ provides monitoring and diagnosis functions on MST/MSC/SSC/SFP fiber ports
- Noise Guard™ provides a high level of EMC immunity for critical applications, exceeding IEEE 1613 Class 2
- Software-based IEEE 1588v2 PTP (Precision Time Protocol) for time synchronization of networks
- VLAN Unaware: Supports priority-tagged frames to be received by specific IEDs
- DHCP Option 82 for IP address assignment with different policies
- EtherNet/IP and Modbus/TCP industrial Ethernet protocols supported
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- Bandwidth management prevents unpredictable network status
- Multiport mirroring for online debugging
- Automatic warning by exception through email, relay output
- RMON for efficient network monitoring and proactive capability
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by web browser, Telnet/Serial console, CLI, Windows utility, and ABC-02 automatic backup configurator

Cybersecurity Features

- User passwords with multiple levels of security to protect against unauthorized configuration
- SSH/HTTPS is used to encrypt passwords and data
- Lock switch ports with 802.1X port-based network access control so that only authorized clients can access the port
- Disable one or more ports to block network traffic
- 802.1Q VLAN allows you to logically partition traffic transmitted between selected switch ports
- Secure switch ports so that only specific devices and/or MAC addresses can access the ports
- RADIUS/TACACS+ allows you to manage passwords from a central location
- SNMPv3 provides encrypted authentication and access security

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid Spanning Tree Protocol
IEEE 802.1s for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Software Features

Management: IPv4/IPv6, SNMPv1/v2c/v3, DHCP Server/ Client, BootP, TFTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, DHCP Option 66/67/82, LLDP, Flow Control, Back Pressure, SNMP Inform, Port Mirror, Fiber Check, Syslog
Filter: IGMPv1/v2, GMRP, GVRP, 802.1Q VLAN, VLAN Unaware, Port-Based VLAN, GVRP
Redundancy Protocols: STP/RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Port Lock, Broadcast Storm Protection, Rate Limit
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Power Substation: MMS, IEC 61850 QoS, Configuration Wizard

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 256
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
Jumbo Frame Size: 9728 bytes

Interface

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed
Fiber Ports: 100/1000BaseSFP slot, 100BaseFX Multi-mode ST/SC Connector
Console Port: USB console port (Type B connector)
Storage Port: USB storage port (Type A connector)
Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Optical Fiber

	100BaseFX		
	Multi-mode	Single-mode	Single-mode, 80 km
Wavelength	1300 nm	1310 nm	1550 nm
Max. TX	-10 dBm	0 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm	34 dBm
Link Budget	12 dB	29 dB	29 dB
Typical Distance	5 km[a] 4 km[b]	40 km[c]	80 km[d]
Saturation	-6 dBm	-3 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm single-mode fiber optic cable
d. 9/125 µm single-mode fiber optic cable (80 km)

Power Requirements

Input Voltage:
• WV: 24/48 VDC
• HV: 110/220 VDC/VAC
Operating Voltage:
• WV: 18 to 72 V
• HV: 88 to 300 VDC and 85 to 264 VAC
Input Current: For models with fewer than 8 fiber ports:
• Max. 0.741 A @ 24 VDC
• Max. 0.364 A @ 48 VDC
• Max. 0.147/0.077 A @ 110/220 VDC
• Max. 0.283/0.19 A @ 110/220 VAC
For models with 8 or more fiber ports:
• Max. 1.428 A @ 24 VDC
• Max. 0.735 A @ 48 VDC
• Max. 0.313/0.167 A @ 110/220 VDC
• Max. 0.586/0.382 A @ 110/220 VAC
Overload Current Protection: Present
Connection: 10-pin terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Aluminum alloy
IP Rating: IP40 protection
Dimensions: 440 x 44 x 325 mm (17.32 x 1.73 x 12.80 in)
Weight: 4900 g (10.89 lb)
Installation: 19-inch rack mounting

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F), cold start requires min. of 100 VAC at -40°C
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 35 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
IEC 61000-4-11
Rail Traffic: EN 50121-4
Transportation: NEMA TS2
Electrical Substation: IE C61850-3, IEEE 1613 Class 2 (models with MCS and SSC fiber ports are compliant with IEEE 1613 Class 1)

MTBF (mean time between failures)

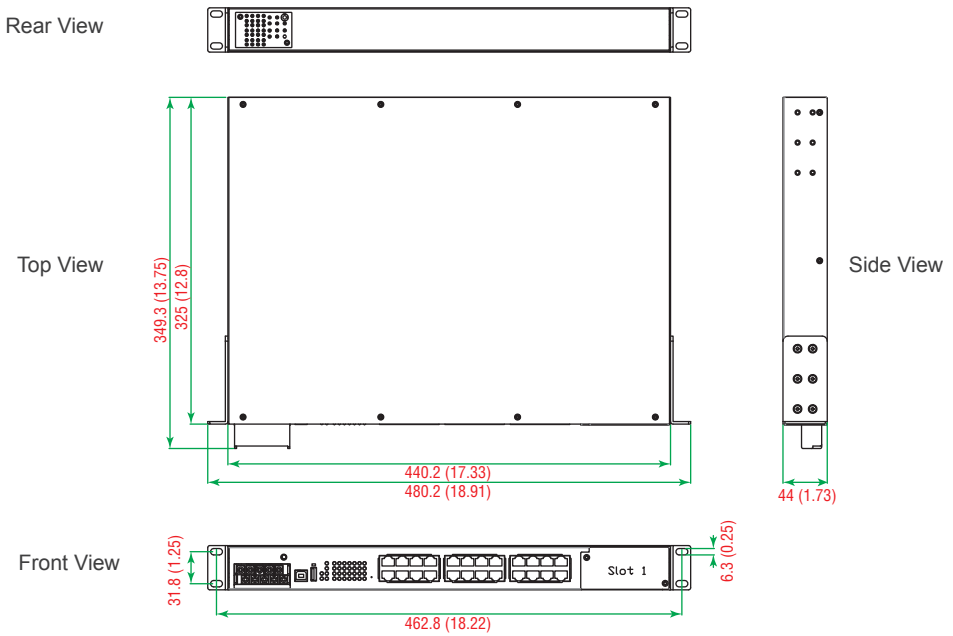
Time: 422,912 hrs
Standard: Telcordia TR/SR

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models	Port Interface						Power Supply			
Rackmount, Front Cabling, Front & Rear Display	Gigabit Ethernet	Fast Ethernet				Slot for PM-7500 Series	Isolated Power Supply 1		Isolated Power Supply 2	
	1000BaseX SFP Slot	100BaseFX Multi-mode, ST Connector	100BaseFX Multi-mode, SC Connector	100BaseFX Single-mode, SC Connector	10/100BaseT(X) RJ45		WV: 24/48 VDC	HV: 110/220 VDC/VAC	WV: 24/48 VDC	HV: 110/220 VDC/VAC
PT-7528-24TX-WV	–	–	–	–	24	1	✓	–	–	–
PT-7528-24TX-HV	–	–	–	–	24	1	–	✓	–	–
PT-7528-24TX-WV-WV	–	–	–	–	24	1	✓	–	✓	–
PT-7528-24TX-WV-HV	–	–	–	–	24	1	✓	–	–	✓
PT-7528-24TX-HV-HV	–	–	–	–	24	1		✓	–	✓
PT-7528-8MST-16TX-4GSFP-WV	4	8	–	–	16	–	✓	–	–	–
PT-7528-8MST-16TX-4GSFP-WV-WV	4	8	–	–	16	–	✓	–	✓	–
PT-7528-8MST-16TX-4GSFP-HV	4	8	–	–	16	–	–	✓	–	–
PT-7528-8MST-16TX-4GSFP-HV-HV	4	8	–	–	16	–	–	✓	–	✓
PT-7528-12MST-12TX-4GSFP-WV	4	12	–	–	12	–	✓	–	–	–
PT-7528-12MST-12TX-4GSFP-WV-WV	4	12	–	–	12	–	✓	–	✓	–
PT-7528-12MST-12TX-4GSFP-HV	4	12	–	–	12	–	–	✓	–	–
PT-7528-12MST-12TX-4GSFP-HV-HV	4	12	–	–	12	–	–	✓	–	✓
PT-7528-16MST-8TX-4GSFP-WV	4	16	–	–	8	–	✓	–	–	–
PT-7528-16MST-8TX-4GSFP-WV-WV	4	16	–	–	8	–	✓	–	✓	–
PT-7528-16MST-8TX-4GSFP-HV	4	16	–	–	8	–	–	✓	–	–
PT-7528-16MST-8TX-4GSFP-HV-HV	4	16	–	–	8	–	–	–	–	✓
PT-7528-20MST-4TX-4GSFP-WV	4	20	–	–	4	–	✓	–	–	–
PT-7528-20MST-4TX-4GSFP-WV-WV	4	20	–	–	4	–	✓	–	✓	–
PT-7528-20MST-4TX-4GSFP-HV	4	20	–	–	4	–	–	✓	–	–
PT-7528-20MST-4TX-4GSFP-HV-HV	4	20	–	–	4	–	–	✓	–	✓
PT-7528-8MSC-16TX-4GSFP-WV	4	–	8	–	16	–	✓	–	–	–
PT-7528-8MSC-16TX-4GSFP-WV-WV	4	–	8	–	16	–	✓	–	✓	–

Available Models	Port Interface						Power Supply			
Rackmount, Front Cabling, Front & Rear Display	Gigabit Ethernet	Fast Ethernet				Slot for PM-7500 Series	Isolated Power Supply 1		Isolated Power Supply 2	
	1000BaseX SFP Slot	100BaseFX Multi-mode, ST Connector	100BaseFX Multi-mode, SC Connector	100BaseFX Single-mode, SC Connector	10/100BaseT(X) RJ45		WV: 24/48 VDC	HV: 110/220 VDC/VAC	WV: 24/48 VDC	HV: 110/220 VDC/VAC
PT-7528-8MSC-16TX-4GSFP-HV	4	–	8	–	16	–	–	✓	–	–
PT-7528-8MSC-16TX-4GSFP-HV-HV	4	–	8	–	16	–	–	✓	–	✓
PT-7528-12MSC-12TX-4GSFP-WV	4	–	12	–	12	–	✓	–	–	–
PT-7528-12MSC-12TX-4GSFP-WV-WV	4	–	12	–	12	–	✓	–	✓	–
PT-7528-12MSC-12TX-4GSFP-HV	4	–	12	–	12	–	–	✓	–	–
PT-7528-12MSC-12TX-4GSFP-HV-HV	4	–	12	–	12	–	–	✓	–	✓
PT-7528-16MSC-8TX-4GSFP-WV	4	–	16	–	8	–	✓	–	–	–
PT-7528-16MSC-8TX-4GSFP-WV-WV	4	–	16	–	8	–	✓	–	✓	–
PT-7528-16MSC-8TX-4GSFP-HV	4	–	16	–	8	–	–	✓	–	–
PT-7528-16MSC-8TX-4GSFP-HV-HV	4	–	16	–	8	–	–	✓	–	✓
PT-7528-20MSC-4TX-4GSFP-WV	4	–	20	–	4	–	✓	–	–	–
PT-7528-20MSC-4TX-4GSFP-WV-WV	4	–	20	–	4	–	✓	–	✓	–
PT-7528-20MSC-4TX-4GSFP-HV	4	–	20	–	4	–	–	✓	–	–
PT-7528-20MSC-4TX-4GSFP-HV-HV	4	–	20	–	4	–	–	✓	–	✓
PT-7528-8SSC-16TX-4GSFP-WV-WV	4	–	–	8	16	–	✓	–	✓	–
PT-7528-8SSC-16TX-4GSFP-HV-HV	4	–	–	8	16	–	–	✓	–	✓

Note:
PT-7528-24TX high density copper port models have a slot reserved for PM-7500 series modules for fiber and gigabit extension. A selection table of PM-7500 interface modules is included towards the end of this datasheet.
Models with mixed WV and HV power and models with mixed Multi-mode and Single-mode fiber are available by request on a project basis.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-02 Series: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- PT-7528 switch
- USB Cable: CBL-USBA/B-100
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide
- Warranty card

PT-7728 Series

IEC 61850-3 24+4G-port Layer 2 Gigabit modular managed rackmount Ethernet switches

- IEC 61850-3, IEEE 1613 (power substations), and EN 50121-4 (railway applications) compliant
- Built-in MMS server based on IEC 61850-90-4 switch data modeling for power SCADA
- Complies with a portion of EN 50155 specifications
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- VLAN Unaware: Supports priority-tagged frames to be received by specific IEDs
- Up to 12 ports with M12 connectors
- Isolated redundant power supplies with universal 24 VDC, 48 VDC, or 110/220 VDC/VAC power supply range
- -40 to 85°C operating temperature range

Introduction

The PowerTrans PT-7728 is designed to meet the demands of power substation automation systems (IEC 61850-3, IEEE 1613), and railway applications (EN 50121-4), and also features critical packet prioritization (GOOSE, SMVs, and PTP) and a built-in MMS server. The PT-7728's Gigabit and Fast Ethernet backbone, redundant ring, and 24 VDC, 48 VDC, or 110/220 VDC/VAC dual isolated redundant power supplies increase the reliability of your communications and save on cabling/wiring costs. The modular design of the PT-7728 also makes network planning easy, and allows greater flexibility by letting you install up to 4 Gigabit ports and 24 Fast Ethernet ports. Along with the optional front or rear wiring, these features together make the PT-7728 suitable for a variety of industrial applications.

General Features and Benefits

- Built-in MMS server for integration with power SCADA systems
- Switch data modeling based on the IEC 61850-90-4 standard
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Software-based IEEE 1588v2 PTP (Precision Time Protocol) for time synchronization of networks
- VLAN Unaware: Supports priority-tagged frames to be received by specific IEDs
- DHCP Option 82 for IP address assignment with different policies
- EtherNet/IP and Modbus/TCP industrial Ethernet protocols supported
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- Supports advanced VLAN capability with Q-in-Q tagging
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- Bandwidth management prevents unpredictable network status
- Multi-port mirroring for online debugging
- Automatic warning by exception through email, relay output
- RMON for efficient network monitoring and proactive capability
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by web browser, Telnet/serial console, CLI, Windows utility, and ABC-01 automatic backup configurator

Cybersecurity Features

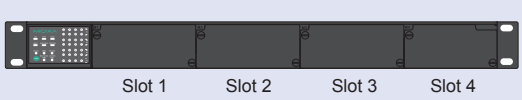
- User passwords with multiple levels of security protect against unauthorized configuration
- SSH/HTTPS is used to encrypt passwords and data
- Lock switch ports with 802.1X port-based network access control so that only authorized clients can access the port
- Disable one or more ports to block network traffic
- 802.1Q VLAN allows you to logically partition traffic transmitted between selected switch ports
- Secure switch ports so that only specific devices and/or MAC addresses can access the ports
- RADIUS/TACACS+ allows you to manage passwords from a central location
- SNMPv3 provides encrypted authentication and access security

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control

Modular Rackmount Ethernet Switch System, PT-7728



IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid Spanning Tree Protocol
IEEE 802.1s for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Software Features

Management: IPv4/IPv6, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SMTP, RARP, HTTP, HTTPS, Telnet, DHCP Option 66/67/82, LLDP, Flow Control, Back Pressure Flow Control, SNMP Inform, Port Mirror, Fiber Check, Syslog, RMON
Filter: IGMPv1/v2, GMRP, GVRP, 802.1Q VLAN, VLAN Unaware, Q-in-Q VLAN, GVRP
Redundancy Protocols: STP/RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Port Lock, Broadcast Storm Protection
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Power Substation: MMS, IEC 61850 QoS

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet: Slots 1, 2, and 3 for combinations of 2, 4, 6, or 8-port PM-7200 Fast Ethernet modules with 10/100BaseT(X) (TP/M12 interface), 100BaseFX (SC/ST/MTRJ connector), or 100BaseSFP.
Gigabit Ethernet: Slot 4 for 2 or 4-port PM-7200 Gigabit Ethernet combo module, 10/100/1000BaseT(X) or 1000BaseSFP
Console Port: RS-232 (RJ45)
Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Power Requirements

Input Voltage:
• 24 VDC
• 48 VDC
• 110/220 VDC/VAC
Note: Compliant with EN 50155 on 24/48/110 VDC

Operating Voltage:
• 18 to 36 V (24 VDC)
• 36 to 72 V (48 VDC)
• 88 to 300 VDC, 85 to 264 VAC (110/220 VDC/VAC)
Input Current: (all ports are equipped with fiber)
• Max. 2.38 A @ 24 VDC
• Max. 1.12 A @ 48 VDC
• Max. 0.59/0.30 A @ 110/220 VDC
• Max. 0.49/0.26 A @ 110/220 VAC
Overload Current Protection: Present
Connection: 10-pin terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Aluminum alloy
IP Rating: IP30 protection
Dimensions: 440 x 44 x 325 mm (17.32 x 1.73 x 12.80 in)
Weight: 5900 g (13.11 lb)
Installation: 19-inch rack mounting

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F), cold start requires min. of 100 VAC at -40°C
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 60950-1
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 35 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
IEC 61000-4-11
Rail Traffic: EN 50155*, EN 50121-4
*Complies with a portion of EN 50155 specifications.
Note: Please check Moxa's website for the most up-to-date certification status.
Transportation: NEMA TS2
Electrical Substation: IEC 61850-3, IEEE 1613

MTBF (mean time between failures)

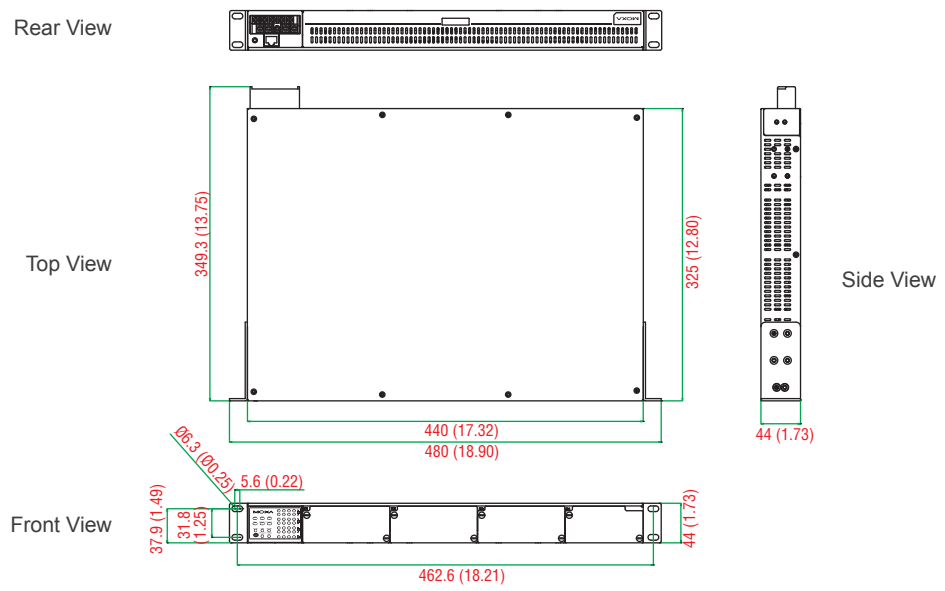
Time: 393,828 hrs
Standard: Telcordia SR332

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Step 1: Select Ethernet switch system

PT-7728 with power supply

Step 2: Select interface modules

PM-7200 modules (Gigabit or Fast Ethernet)

Note: The PT-7728 Ethernet switch system is delivered without interface module. See the PM-7200/7500 Series datasheet to choose PM-7200 interface modules.

PT-7728 Modular Rackmount Ethernet Switch System

The PT-7728 switch system consists of 16 modular managed rackmount Ethernet switch systems with 3 slots for Fast Ethernet modules, and 1 slot for a Gigabit Ethernet module. A total of 28 or 24+4G ports can be installed, and the switch can be used in a temperature range from -40 to 85°C.

Available Models		Power Supply					
		Isolated Power Supply 1			Isolated Power Supply 2		
Front Cabling, Front Display	Rear Cabling, Front Display	24 VDC	48 VDC	HV: 110/220 VDC/VAC	24 VDC	48 VDC	HV: 110/220 VDC/VAC
PT-7728-F-24	PT-7728-R-24	1	–	–	–	–	–
PT-7728-F-24-24	PT-7728-R-24-24	1	–	–	1	–	–
PT-7728-F-24-HV	PT-7728-R-24-HV	1	–	–	–	–	1
PT-7728-F-48	PT-7728-R-48	–	1	–	–	–	–
PT-7728-F-48-48	PT-7728-R-48-48	–	1	–	–	1	–
PT-7728-F-48-HV	PT-7728-R-48-HV	–	1	–	–	–	1
PT-7728-F-HV	PT-7728-R-HV	–	–	1	–	–	–
PT-7728-F-HV-HV	PT-7728-R-HV-HV	–	–	1	–	–	1

Note: The PT-7728 Ethernet switch systems provide combinations of 1 slot for a Gigabit Ethernet interface module, 3 slots for Fast Ethernet interface modules. See the PM-7200/7500 Series datasheet to select the PM-7200 Gigabit Ethernet and Fast Ethernet interface modules that you need for your own application.

PT-7728-F series
(Front Cabling, Front Display)

PT-7728-R series
(Rear Cabling, Front Display)

Gigabit/Fast Ethernet Modules for the PT-7728

	Interface Modules																						
	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-2MSC	PM-7200-2MST	PM-7200-2SSC	PM-7200-8TX	PM-7200-2MSC4TX	PM-7200-2MST4TX	PM-7200-2SSC4TX	PM-7200-4MSC2TX	PM-7200-4MST2TX	PM-7200-4SSC2TX	PM-7200-6MSC	PM-7200-6MST	PM-7200-6SSC	PM-7200-8SFP	PM-7200-4M12	PM-7200-8MTRJ	PM-7200-4TX-PTP	PM-7200-4MST-PTP	PM-7200-4MSC-PTP	PM-7200-1BNC2MST-PTP
Slot 1	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–
Slot 2	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–
Slot 3	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–
Slot 4	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01 Series: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- PT-7728 switch
- Serial Cable: CN20070
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide
- Warranty card

PT-G7509 Series

IEC 61850-3 9G-port Layer 2 full Gigabit managed rackmount Ethernet switches

- IEC 61850-3, IEEE 1613 (power substations) compliant
- VLAN Unaware: Supports priority-tagged frames to be received by specific IEDs
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP for network redundancy
- Isolated redundant power supplies with universal 24 VDC, 48 VDC, or 110/220 VDC/VAC power supply range
- -40 to 85°C operating temperature range

Introduction

The PowerTrans PT-G7509 is equipped with 9 combo Gigabit Ethernet ports, making it ideal for upgrading an existing network to Gigabit speeds and building a new full Gigabit backbone. The PT-G7509 is designed to meet the demands of power substation automation systems (IEC 61850-3, IEEE 1613). Gigabit transmission increases bandwidth to provide higher performance and transfer large amounts of video, voice, and data across a network quickly. The redundant Ethernet Turbo Ring, Turbo Chain, and RSTP/STP/MSTP (IEEE 802.1w/D/s) functions increase system reliability and the availability of your network backbone. The choice of either front or rear wiring makes the PT-G7509 suitable for different types of application.

General Features and Benefits

- Command line interface (CLI) for quickly configuring major managed functions
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Software-based IEEE 1588v2 PTP (Precision Time Protocol) for time synchronization of networks
- VLAN Unaware: Supports priority-tagged frames to be received by specific devices
- DHCP Option 82 for IP address assignment with different policies
- EtherNet/IP and Modbus/TCP industrial Ethernet protocols supported
- Turbo Ring and Turbo Chain (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- Bandwidth management prevents unpredictable network status
- Automatic warning by exception through email, relay output
- RMON for efficient network monitoring and proactive capability
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by web browser, Telnet/serial console, CLI, Windows utility, and ABC-01 automatic backup configurator

Cybersecurity Features

- User passwords with multiple levels of security to protect against unauthorized configuration
- SSH/HTTPS is used to encrypt passwords and data
- Lock switch ports with 802.1X port-based network access control so that only authorized clients can access the port
- Disable one or more ports to block network traffic
- 802.1Q VLAN allows you to logically partition traffic transmitted between selected switch ports
- Secure switch ports so that only specific devices and/or MAC addresses can access the ports
- RADIUS/TACACS+ allows you to manage passwords from a central location
- SNMPv3 provides encrypted authentication and access security

Specifications

Technology

Standards:

IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Software Features

Management: IPv4/IPv6, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SMTP, RARP, HTTP, HTTPS, Telnet, DHCP Option 66/67/82, LLDP, Flow Control, Back Pressure Flow Control, SNMP Inform, Port Mirror, Syslog
Filter: IGMPv1/v2, GMRP, GVRP, 802.1Q VLAN, VLAN Unaware, Port-Based VLAN, GVRP
Redundancy Protocols: STP/RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Port Lock
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed
Fiber Ports: 100/1000BaseSFP slot
Console Port: RS-232 (RJ45)
Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Power Requirements

Input Voltage:
• 24 VDC
• 48 VDC
• 110/220 VDC/VAC
Operating Voltage:
• 18 to 36 V (24 VDC)
• 36 to 72 V (48 VDC)
• 88 to 300 VDC, 85 to 264 VAC (110/220 VAC/VDC)
Input Current: (all ports are equipped with fiber)
• Max. 1.08 A @ 24 VDC
• Max. 0.55 A @ 48 VDC
• Max. 0.25/0.15 A @ 110/220 VDC
• Max. 0.57/0.33 A @ 110/220 VAC
Overload Current Protection: Present
Connection: 10-pin terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Aluminum alloy
IP Rating: IP30 protection
Dimensions: 440 x 44 x 254 mm (17.32 x 1.73 x 10.00 in)
Weight: 3300 g (7.33 lb)
Installation: 19-inch rack mounting

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F), cold start requires min. of 100 VAC at -40°C
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 60950-1, CSA C22.2 No. 60950-1, EN 60950-1
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 35 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
IEC 61000-4-11
Electrical Substation: IEC 61850-3, IEEE 1613
*Complies with a portion of EN 50155 specifications.
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

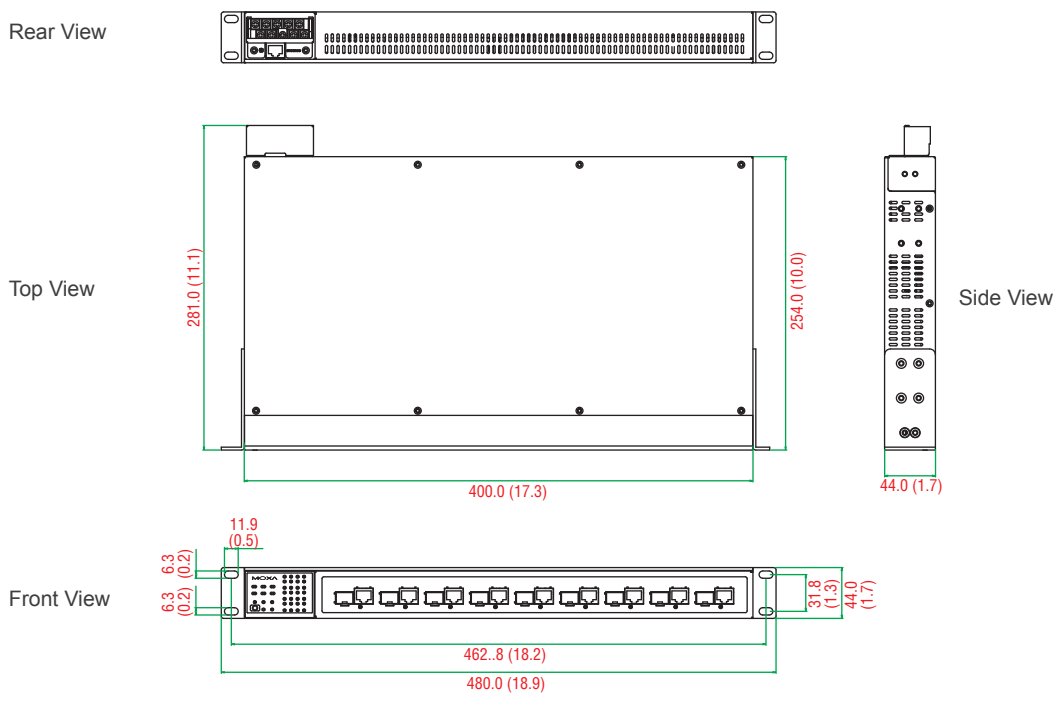
Time: 258,058 hrs
Standard: Telcordia SR332

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

PT-G7509 Full Gigabit Managed Rackmount Ethernet Switch System

The PT-G7509 switch system consists of 9 combo 10/100/1000BaseT(X) or 100/1000BaseSFP slot Gigabit ports and the switch can be used in a temperature range from -40 to 85°C.

Note: See the SFP-1G and SFP-1FE datasheets for SFP-1G/1FE series Gigabit/Fast Ethernet SFP module product information.

Available Models		Power Supply					
		Isolated Power Supply 1			Isolated Power Supply 2		
Front Cabling, Front Display	Rear Cabling, Front Display	24 VDC	48 VDC	HV: 110/220 VDC/VAC	24 VDC	48 VDC	HV: 110/220 VDC/VAC
PT-G7509-F-24	PT-G7509-R-24	1	–	–	–	–	–
PT-G7509-F-24-24	PT-G7509-R-24-24	1	–	–	1	–	–
PT-G7509-F-24-HV	PT-G7509-R-24-HV	1	–	–	–	–	1
PT-G7509-F-48	PT-G7509-R-48	–	1	–	–	–	–
PT-G7509-F-48-48	PT-G7509-R-48-48	–	1	–	–	1	–
PT-G7509-F-HV	PT-G7509-R-HV	–	–	1	–	–	–
PT-G7509-F-HV-HV	PT-G7509-R-HV-HV	–	–	1	–	–	1

PT-G7509-F series
(Front Cabling, Front Display)

PT-G7509-R series
(Rear Cabling, Front Display)

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- PT-G7509 switch
- Serial Cable: CN20070
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide
- Warranty card

PT-7710 Series

IEC 61850-3 8+2G-port Layer 2 Gigabit modular managed rackmount Ethernet switches

- IEC 61850-3, IEEE 1613 (power substations), and EN50121-4 (railway applications) compliant
- Complies with a portion of EN 50155 specifications
- VLAN Unaware: Supports priority-tagged frames to be received by specific IEDs
- Up to 4 ports with M12 connectors
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- Universal power supply range, 12/24/48 VDC or 110/220 VDC/VAC
- -40 to 85°C operating temperature range

Introduction

The PowerTrans PT-7710 is designed to meet the demands of power substation automation systems (IEC 61850-3, IEEE 1613), and railway applications (EN 50121-4). The PT-7710's Gigabit and Fast Ethernet backbone, redundant ring, and 12/24/48 VDC redundant power inputs increase the reliability of the communications and reduce cabling and wiring costs. The modular design of the PT-7710 makes network planning easy, and allows greater flexibility by letting you install up to 2 Gigabit ports and 8 Fast Ethernet ports, or 10 Fast Ethernet ports.

General Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Software-based IEEE 1588v2 PTP (Precision Time Protocol) for time synchronization of networks
- VLAN Unaware: Supports priority-tagged frames to be received by specific IEDs
- DHCP Option 82 for IP address assignment with different policies
- EtherNet/IP and Modbus/TCP industrial Ethernet protocols supported
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- Bandwidth management prevents unpredictable network status
- Multi-port mirroring for online debugging
- Automatic warning by exception through email, relay output
- RMON for efficient network monitoring and proactive capability
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by Web browser, Telnet/Serial console, CLI, Windows utility, and ABC-01 automatic backup configurator

Cybersecurity Features

- User passwords with multiple levels of security to protect against unauthorized configuration
- SSH/HTTPS is used to encrypt passwords and data
- Lock switch ports with 802.1X port-based network access control so that only authorized clients can access the port
- Disable one or more ports to block network traffic
- 802.1Q VLAN allows you to logically partition traffic transmitted between selected switch ports
- Secure switch ports so that only specific devices and/or MAC addresses can access the ports
- RADIUS/TACACS+ allows you to manage passwords from a central location
- SNMPv3 provides encrypted authentication and access security

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP

Modular Rackmount Ethernet Switch System, PT-7710

IEEE 802.1s for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Software Features

Management: IPv4/IPv6, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, DHCP Option 66/67/82, LLDP, Flow Control, Back Pressure Flow Control, SNMP Inform, Port Mirror, Syslog
Filter: IGMPv1/v2, GMRP, GVRP, 802.1Q, VLAN Unaware, Port-Based VLAN, GVRP
Redundancy Protocols: STP/RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Port Lock, Rate Limit
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet: Slot 1 for any combination of 2, 4, 6, or 8-port PM-7200 Fast Ethernet modules with 10/100BaseT(X) (TP/M12 interface), 100BaseFX (SC/ST/MTRJ connector), or 100BaseSFP; Slot 2 for 1 or 2-port interface modules with 100BaseFX (SC/ST connector)
Gigabit Ethernet: Slot 2 for 2-port PM-7200 Gigabit Ethernet combo module, 100/1000BaseT(X) or 1000BaseSFP
Console Port: RS-232 (RJ45)
Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Power Requirements

Input Voltage:
• LV: 12/24/48 VDC
• HV: 110/220 VDC/VAC
Note: Compliant with EN 50155 on 12/24/48/110 VDC
Operating Voltage:
• LV: 9 to 60 V
• HV: 88 to 300 VDC, 85 to 264 VAC
Input Current: (all ports are equipped with fiber)
• Max. 0.75 A @ 24 VDC
• Max. 0.39 A @ 48 VDC
• Max. 0.16/0.10 A @ 110/220 VDC
• Max. 0.19/0.11 A @ 110/220 VAC
Overload Current Protection: Present
Connection: 10-pin terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Aluminum alloy
IP Rating: IP30 protection
Dimensions: 266.5 x 44 x 195 mm (10.5 x 1.7 x 7.7 in)
Weight: 2200 g (4.89 lb)
Installation: 19-inch rack mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F); cold start requires min. of 100 VAC at -40°C
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 60950-1, CSA C22.2 No. 60950-1, EN 60950-1
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 35 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
IEC 61000-4-11
Rail Traffic: EN 50155*, EN 50121-4
*Complies with a portion of EN 50155 specifications. Please contact Moxa or a Moxa distributor for details.
Note: Please check Moxa's website for the most up-to-date certification status.
Transportation: NEMA TS2
Electrical Substation: IEC 61850-3, IEEE 1613

MTBF (mean time between failures)

Time: 416,1008 hrs
Standard: Telcordia SR332

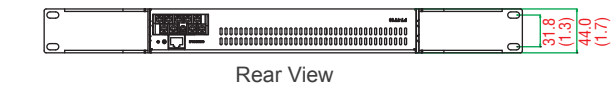
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

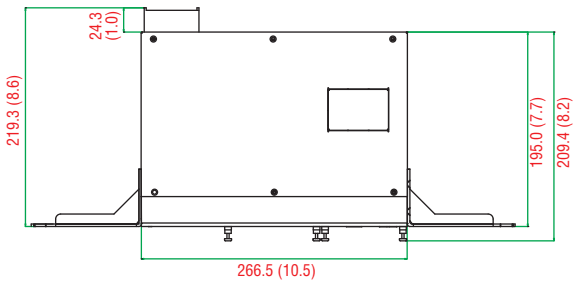
Dimensions

Unit: mm (inch)

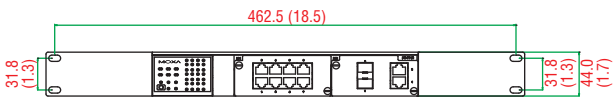
Rack Mounting



Rear View

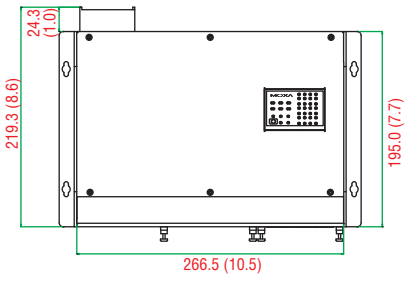


Top View

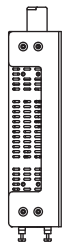


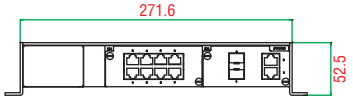
Front View

Wall Mounting



Top View


Side View



Front View

Ordering Information

Step 1: Select Ethernet switch system

PT-7710 with power supply

Step 2: Select interface modules

PM-7200 modules (Gigabit or Fast Ethernet)

Note: The PT-7710 Ethernet switch system is delivered without interface module.
See page 2-52 to choose PM-7200 interface modules.

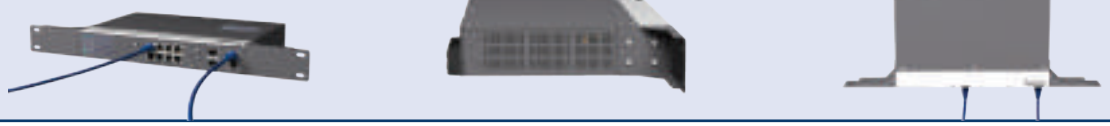
PT-7710 Modular Rackmount Ethernet Switch System

The PT-7710 switch system consists of 4 modular managed rackmount Ethernet switch systems with 1 slot for a Fast Ethernet module, and 1 slot for a Fast Ethernet or Gigabit Ethernet module. A total of 10 or 8+2G ports can be installed, and the switch can be used in temperatures ranging from -40 to 85°C.

Available Models		Power Supply	
Rack Mounting, Front Cabling, Front Display	Wall Mounting, Down Cabling, Front Display	LV: 12/24/48 VDC (9 to 60 V) (Dual power inputs)	HV: 88 to 300 VDC and 85 to 264 VAC, isolated
PT-7710-F-LV	PT-7710-D-LV	1	–
PT-7710-F-HV	PT-7710-D-HV	–	1

Note: The PT-7710 Ethernet switch systems provide 1 slot for a Gigabit Ethernet or Fast Ethernet interface module and 1 slot for a Fast Ethernet interface module.
See page 2-52 to select the PM-7200 Gigabit Ethernet and Fast Ethernet interface modules that you need for your own application.

PT-7710-F series
(Rack Mounting, Front Cabling, Front Display)



PT-7710-D series
(Wall Mounting, Down Cabling, Front Display)

Gigabit/Fast Ethernet Modules for the PT-7710

	Interface Modules																						
	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-2MSC	PM-7200-2MST	PM-7200-2SSC	PM-7200-8TX	PM-7200-2MSC4TX	PM-7200-2MST4TX	PM-7200-2SSC4TX	PM-7200-4MSC2TX	PM-7200-4MST2TX	PM-7200-4SSC2TX	PM-7200-6MSC	PM-7200-6MST	PM-7200-6SSC	PM-7200-8SFP	PM-7200-4M12	PM-7200-8MTRJ	PM-7200-4TX-PTP	PM-7200-4MST-PTP	PM-7200-4MSC-PTP	PM-7200-1BNC2MST-PTP
Slot 1	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–
Slot 2	–	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01 Series: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
WK-195: Wall-mounting kit

Package Checklist

- PT-7710 switch
- Serial Cable: CN20070
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide
- Warranty card

PM-7200/7500 Series

Gigabit and Fast Ethernet modules for PT and IKS series rackmount Ethernet switches

Specifications

Gigabit Ethernet Interface Modules, PM-7200/7500-2G/4G Series

PM-7200-4GTXSFP

PM-7200-2GTXSFP

PM-7200-4GTX-PHR-PTP

PM-7200-4GSFP-PHR-PTP

PM-7500-4GTXSFP

PM-7500-2GTXSFP

Interface

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed, and auto MDI/MDI-X connection

Fiber Ports: 1000BaseSFP slots

Note: The PM-7200/7500-2G/4G series Gigabit Ethernet combo modules support 2 or 4 SFP slots. See the SFP-1G datasheet to select the SFP-1G series Gigabit Ethernet modules for your application.

Fast Ethernet Interface Modules, PM-7200/7500 Series

PM-7200-8TX

PM-7200-6MSC
PM-7200-6SSC

PM-7200-6MST

PM-7200-4MSC2TX
PM-7200-4SSC2TX

PM-7200-4MST2TX

PM-7200-2MSC4TX
PM-7200-2SSC4TX

PM-7200-2MST4TX

PM-7200-2MSC
PM-7200-2SSC

PM-7200-2MST

PM-7200-1MSC

PM-7200-1MST

PM-7200-8SFP*

PM-7200-4M12

PM-7200-8MTRJ

PM-7200-4TX-PTP

PM-7200-4MSC-PTP

PM-7200-4MST-PTP

PM-7200-1BNC2MST-PTP

PM-7500-4MSC
PM-7500-4SSC

PM-7500-2MSC
PM-7500-2SSC

PM-7500-2MST

PM-7500-4MST

*Note: See the SFP-1FE datasheet to select SFP-1FE series Fast Ethernet modules for your application.

Interface

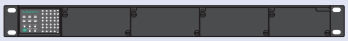
RJ45 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100BaseFX ports (SC/ST/MTRJ or SFP LC connector)
M12 Ports: 10/100BaseT(X) auto negotiation speed, and auto MDI/MDI-X connection
BNC Ports: Time clock signal PPS (pulses per second) output for IEEE 1588 time synchronization

Ordering Information

Rackmount Ethernet Switch System and Interface Module Compatibility Chart

Modular Rackmount Ethernet Switch System:

PT-7828/PT-7728-PTP/ PT-7728



PT-7528-24TX

PT-7710

		IEEE 1588 Interface Modules						Interface Modules																						
		PM-7200-4TX-PTP	PM-7200-4MSC-PTP	PM-7200-4MST-PTP	PM-7200-1BNC2MST-PTP	PM-7200-4GTX-PHR-PTP	PM-7200-4GSFP-PHR-PTP	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7500-2GTXSFP	PM-7500-4GTXSFP	PM-7200-1MSC/2MSC	PM-7200-1MST/2MST	PM-7200-2SSC	PM-7200-8TX	PM-7200-2MSC4TX	PM-7200-2MST4TX	PM-7200-2SSC4TX	PM-7200-4MSC2TX	PM-7200-4MST2TX	PM-7200-4SSC2TX	PM-7200-6MSC	PM-7200-6MST	PM-7200-6SSC	PM-7200-8SFP*	PM-7200-4M12	PM-7200-8MTRJ	PM-7500-2MSC/4MSC	PM-7500-2MST/4MST	PM-7500-2SSC/4SSC
PT-7828 PT-7728	Slots 1 to 3	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–
	Slot 4	–	–	–	–	–	–	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PT-7728-PTP	Slots 1 to 3	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–
	Slot 4	–	–	–	✓	✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PT-7528-24TX	Slot 1	–	–	–	–	–	–	–	–	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	✓
PT-7710	Slot 1	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–
	Slot 2	–	–	–	–	–	–	–	✓	–	–	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

*Note: See the SFP-1FE datasheet to select SFP-1FE series Fast Ethernet modules for your application.

Gigabit Ethernet Modules, PM-7200/7500-2G/4G Series

Available Models	Port Interface
	Combo Port, 10/100/1000BaseT(X) or 1000BaseSFP*
PM-7200-2GTXSFP	2
PM-7200-4GTXSFP	4
PM-7500-2GTXSFP	2
PM-7500-4GTXSFP	4

*The PM-7200/7500-2G/4G series Gigabit Ethernet combo modules support 2 or 4 SFP slots.

Gigabit PRP/HSR Ethernet Modules, PM-7200-PHR-PTP Series:

Available Mode	Port Interface	
	10/100/1000BaseT(X)	100/1000BaseSFP
PM-7200-4GTX-PHR-PTP	4	–
PM-7200-4GSFP-PHR-PTP	–	4

Fast Ethernet Modules, PM-7200/7500 Series

Available Models	Port Interface									
	10/100BaseT(X)		10BaseFX	100BaseFX					100BaseSFP	PPS output, BNC connector
	TP	M12	Multi-mode, ST Connector	Multi-mode, SC Connector	Multi-mode, ST Connector	Multi-mode, MTRJ Connector	Single-mode, SC Connector	Single-mode, SC Connector, 80 km		
PM-7200-8TX	8	–	–	–	–	–	–	–	–	–
PM-7200-6MSC	–	–	–	6	–	–	–	–	–	–
PM-7200-6MST	–	–	–	–	6	–	–	–	–	–
PM-7200-6SSC	–	–	–	–	–	–	6	–	–	–
PM-7200-4MSC2TX	2	–	–	4	–	–	–	–	–	–
PM-7200-4MST2TX	2	–	–	–	4	–	–	–	–	–
PM-7200-4SSC2TX	2	–	–	–	–	–	4	–	–	–
PM-7200-2MSC4TX	4	–	–	2	–	–	–	–	–	–
PM-7200-2MST4TX	4	–	–	–	2	–	–	–	–	–
PM-7200-2SSC4TX	4	–	–	–	–	–	2	–	–	–
PM-7200-2MSC	–	–	–	2	–	–	–	–	–	–
PM-7200-2MST	–	–	–	–	2	–	–	–	–	–
PM-7200-2SSC	–	–	–	–	–	–	2	–	–	–
PM-7200-1MSC	–	–	–	1	–	–	–	–	–	–
PM-7200-1MST	–	–	–	–	1	–	–	–	–	–
PM-7200-8SFP*	–	–	–	–	–	–	–	–	8	–
PM-7200-4M12	–	4	–	–	–	–	–	–	–	–
PM-7200-8MTRJ	–	–	–	–	–	8	–	–	–	–
PM-7200-4TX-PTP	4	–	–	–	–	–	–	–	–	–
PM-7200-4MSC-PTP	–	–	–	4	–	–	–	–	–	–
PM-7200-4MST-PTP	–	–	–	–	4	–	–	–	–	–
PM-7200-1BNC2MST-PTP	–	–	–	–	2	–	–	–	–	1
PM-7500-2MSC	–	–	–	2	–	–	–	–	–	–
PM-7500-2MST	–	–	–	–	2	–	–	–	–	–
PM-7500-2SSC	–	–	–	–	–	–	2	–	–	–
PM-7500-4MSC	–	–	–	4	–	–	–	–	–	–
PM-7500-4MST	–	–	–	–	4	–	–	–	–	–
PM-7500-4SSC	–	–	–	–	–	–	4	–	–	–

*Note: See the SFP-1FE datasheet to select SFP-1FE series Fast Ethernet modules for your application.

Package Checklist

- PM-7200/7500 interface modules
- Warranty card

PT-508/510 Series

IEC 61850-3 8/10-port Layer 2 DIN-rail managed Ethernet switches

- IEC 61850-3 and IEEE 1613 (power substations) compliant
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- Easy network management by web browser, CLI, Telnet/serial console, windows utility, and ABC-01
- Isolated universal 24 VDC or 48 VDC redundant power inputs
- Wide 110/220 VDC/VAC power supply range
- Modbus/TCP, LLDP, SNMP Inform, QoS, IGMP snooping, VLAN, IEEE 802.1X, HTTPS, SNMPv3, and SSH supported
- -40 to 85°C operating temperature range

Introduction

The PowerTrans PT-508/510 is designed to meet the demands of power substation automation systems (IEC 61850-3, IEEE 1613). The PT-508/510's optical fiber Fast Ethernet backbone, redundant ring, redundant power inputs (24 VDC or 48 VDC), and isolated power inputs (24 VDC, 48 VDC, or 110/220 VDC/VAC) increase the reliability of your communications and save on cabling/wiring costs. In addition, the DIN-rail and wall-mounting design of the PT-508/510 makes network planning easy, and allows greater flexibility by letting you install up to 8/10 Fast Ethernet ports for power distribution applications.

General Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Software-based IEEE 1588v2 PTP (Precision Time Protocol) for time synchronization of networks
- VLAN Unaware: Supports priority-tagged frames to be received by specific IEDs
- DHCP Option 82 for IP address assignment with different policies
- EtherNet/IP and Modbus/TCP industrial Ethernet protocols supported
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- Bandwidth management prevents unpredictable network status
- Multi-port mirroring for online debugging
- Automatic warning by exception through email, relay output
- RMON for efficient network monitoring and proactive capability
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by Web browser, Telnet/Serial console, CLI, Windows utility, and ABC-01 automatic backup configurator

Cybersecurity Features

- User passwords with multiple levels of security protect against unauthorized configuration
- SSH/HTTPS is used to encrypt passwords and data
- Lock switch ports with 802.1X port-based network access control so that only authorized clients can access the port
- Disable one or more ports to block network traffic
- 802.1Q VLAN allows you to logically partition traffic transmitted between selected switch ports
- Secure switch ports so that only specific devices and/or MAC addresses can access the ports
- RADIUS/TACACS+ allows you to manage passwords from a central location
- SNMPv3 provides encrypted authentication and access security

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid Spanning Tree Protocol
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP
IEEE 802.1s for Multiple Spanning Tree Protocol

Software Features

Management: IPv4/IPv6, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, HTTP, HTTPS, Telnet, SNMP Inform, LLDP, Flow Control, Back Pressure Flow Control, Port Mirror, Syslog, RMON
Filter: IGMPv1/v2, GMRP, GVRP, 802.1Q VLAN, VLAN Unaware, Port-Based VLAN, GVRP
Redundancy Protocols: STP/RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Port Lock
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100BaseFX ports (SC/ST/LC/MTRJ connector)
Console Port: RS-232 (RJ45)
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC

Power Requirements

Input Voltage:
• 24 VDC
• 48 VDC
• 110/220 VDC/VAC
Operating Voltage:
• 18 to 36 V (24 VDC)
• 36 to 72 V (48 VDC)
• 88 to 300 VDC, 85 to 264 VAC (110/220 VDC/VAC)
Input Current: (all ports are equipped with fiber)
PT-508:
• Max. 0.27 A @ 24 VDC
• Max. 0.12 A @ 48 VDC
• Max. 0.084/0.043 A @ 110/220 VDC
• Max. 0.18/0.11 A @ 110/220 VAC
PT-510:
• Max. 0.39 A @ 24 VDC
• Max. 0.18 A @ 48 VDC
• Max. 0.10/0.052 A @ 110/220 VDC
• Max. 0.234/0.148 A @ 110/220 VAC
Overload Current Protection: Present
Connection: 5-pin terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Aluminum alloy
IP Rating: IP40 protection
Dimensions:
PT-508: 60 x 160 x 110 mm (2.36 x 6.30 x 4.33 in)
PT-510: 80 x 160 x 110 mm (3.15 x 6.30 x 4.33 in)
Weight:
PT-508: 995 g (2.21 lb)
PT-510: 1210 g (2.69 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F), cold start requires min. of 100 VAC at -40°C
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS: IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz:
PT-508: 20 V/m
PT-510: 35 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power; 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
IEC 61000-4-11
Electrical Substation: IEC 61850-3, IEEE 1613
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time:
PT-508: 394,238 hrs
PT-510: 372,276 hrs
Standard: Telcordia SR332

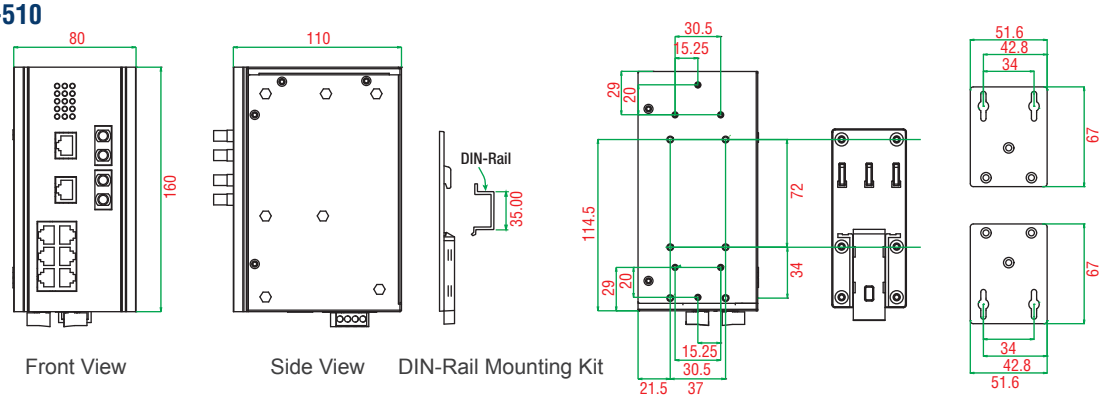
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

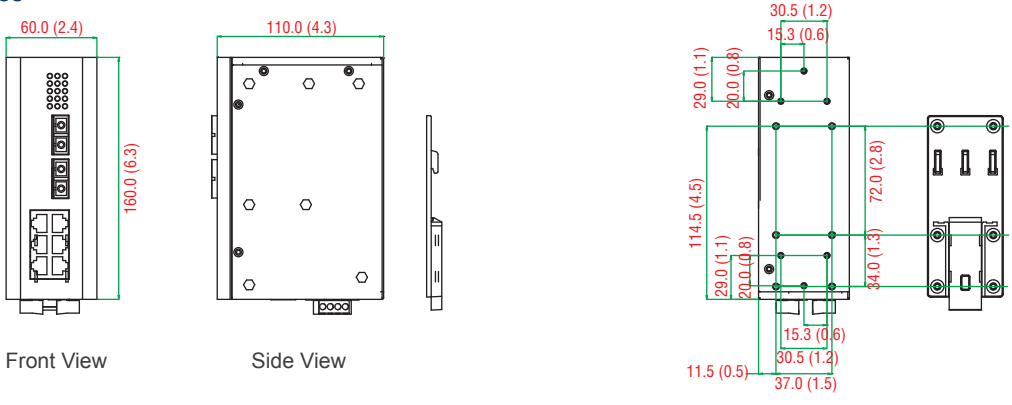
Dimensions

Unit: mm (inch)

PT-510



PT-508



Ordering Information

Available Models				Port Interface						
DIN-Rail, Front Cabling, Front Display	Power Supply			10/100 BaseT(X)	100BaseFX					
	24 VDC	48 VDC	HV: 110/220 VDC/VAC		Multi-mode, SC Connector	Multi-mode, ST Connector	Multi-mode, LC Connector	Multi-mode, MTRJ Connector	Single-mode, SC Connector	Single-mode, LC Connector
PT-508-MM-SC-24	1	–	–	6	2	–	–	–	–	–
PT-508-MM-SC-48	–	1	–	6	2	–	–	–	–	–
PT-508-MM-SC-HV	–	–	1	6	2	–	–	–	–	–
PT-508-MM-ST-24	1	–	–	6	–	2	–	–	–	–
PT-508-MM-ST-48	–	1	–	6	–	2	–	–	–	–
PT-508-MM-ST-HV	–	–	1	6	–	2	–	–	–	–
PT-508-MM-LC-24	1	–	–	6	–	–	2	–	–	–
PT-508-MM-LC-48	–	1	–	6	–	–	2	–	–	–
PT-508-MM-LC-HV	–	–	1	6	–	–	2	–	–	–
PT-508-SS-SC-24	1	–	–	6	–	–	–	–	2	–
PT-508-SS-SC-48	–	1	–	6	–	–	–	–	2	–
PT-508-SS-SC-HV	–	–	1	6	–	–	–	–	2	–
PT-508-SS-LC-24	1	–	–	6	–	–	–	–	–	2
PT-508-SS-LC-48	–	1	–	6	–	–	–	–	–	2
PT-508-SS-LC-HV	–	–	1	6	–	–	–	–	–	2
PT-510-4M-ST-24	1	–	–	6	–	4	–	–	–	–
PT-510-4M-ST-48	–	1	–	6	–	4	–	–	–	–
PT-510-4M-ST-HV	–	–	1	6	–	4	–	–	–	–
PT-510-MM-SC-24	1	–	–	8	2	–	–	–	–	–
PT-510-MM-SC-48	–	1	–	8	2	–	–	–	–	–
PT-510-MM-SC-HV	–	–	1	8	2	–	–	–	–	–
PT-510-MM-ST-24	1	–	–	8	–	2	–	–	–	–
PT-510-MM-ST-48	–	1	–	8	–	2	–	–	–	–
PT-510-MM-ST-HV	–	–	1	8	–	2	–	–	–	–
PT-510-MM-LC-24	1	–	–	8	–	–	2	–	–	–
PT-510-MM-LC-48	–	1	–	8	–	–	2	–	–	–
PT-510-MM-LC-HV	–	–	1	8	–	–	2	–	–	–
PT-510-SS-SC-24	1	–	–	8	–	–	–	–	2	–
PT-510-SS-SC-48	–	1	–	8	–	–	–	–	2	–
PT-510-SS-SC-HV	–	–	1	8	–	–	–	–	2	–
PT-510-3S-SC-HV	–	–	1	7	–	–	–	–	3	–
PT-510-3S-SC-24	1	–	–	7	–	–	–	–	3	–
PT-510-3S-SC-48	–	1	–	7	–	–	–	–	3	–
PT-510-SS-LC-24	1	–	–	8	–	–	–	–	–	2
PT-510-SS-LC-48	–	1	–	8	–	–	–	–	–	2
PT-510-SS-LC-HV	–	–	1	8	–	–	–	–	–	2

Note:
Additional switch configurations with 2 Gigabit ports or 3 or 4 fiber ports are available by special request.
24 VDC, 48 VDC, and HV models support isolated power; only 24 VDC and 48 VDC models support redundant power inputs.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- PT-508/510 switch
- Serial Cable: CN20070
- DIN-rail kit or wall-mounting ears (optional)
- 1 grounding cable
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide
- Warranty card

PT-G503-PHR-PTP Series

IEC 61850-3/62439-3 3-port full Gigabit managed redundancy boxes

- IEC 61850-3, IEEE 1613 (power substations) compliant
- IEC 62439-3 Clause 4 (PRP) and Clause 5 (HSR) compliant
- PRP/HSR Coupling and QuadBox functions supported
- Ethernet console reserved for local access
- Built-in MMS server, based on IEC 61850-90-4 switch modeling for power SCADA
- Hardware-based IEEE 1588v2 PTP supported
- Design ready for NERC CIP compliance system development
- Isolated redundant power inputs with universal 24/48 VDC or 110/220 VDC/VAC power supply range
- -40 to 85°C operating temperature range

Introduction

The PT-G503-PHR-PTP series redundancy boxes (RedBoxes) are compliant with the latest standardized redundancy protocols for industrial automation networks, IEC 62439-3 Clause 4 (Parallel Redundancy Protocol, PRP) and IEC 62439-3 Clause 5 (High-availability Seamless Redundancy, HSR). PRP/HSR ensures the highest system availability and data integrity for mission-critical applications in electrical substation and/or process automation systems that require zero recovery time redundancy. The redundant protocols Coupling and QuadBox are also supported. With Coupling and QuadBox, HSR rings can be connected to make the redundant network more versatile. The PT-G503-PHR-PTP series comes with three 10/100/1000BaseT(X) and 100/1000BaseSFP slot combo ports.

One slot (INTERLINK port) is for an internal link for connecting with a SAN (Singly Attached Node). The other two ports (LAN A and LAN B ports) are for PRP/HSR redundant protocol communications. With this full Gigabit Ethernet port design, the PT-G503-PHR-PTP series provides high performance for PRP/HSR systems.

The PT-G503-PHR-PTP series also provides IEEE 1588v2 PTP in end-to-end one-step transparent clock mode for timing-critical applications and isolated redundant power inputs with 24/48 VDC or 110/220 VDC/VAC power supply ranges to increase the reliability of the power supply.

General Features and Benefits

- PRP (Parallel Redundancy Protocol): Transmit or receive two independent active paths to/from different LANs simultaneously on a zero recovery time network.
- HSR (High-availability Seamless Redundancy): Every frame is duplicated and then transmitted in both directions of the HSR ring to deliver zero switchover time.
- PRP/HSR coupling: Supports coupling from an HSR ring node to redundant PRP LANs (Up to 7 PRP LANs).
- QuadBox function: Supports peer coupling of rings via interconnecting two INTERLINK ports on two separate RedBoxes.
- Fiber Check™ provides monitoring and diagnosis functionality on SFP fiber ports.
- Hardware-based IEEE 1588v2 PTP (Precision Time Protocol) end-to-end one-step transparent clock for precise time synchronization of networks.
- Built-in MMS server for integration with power SCADA systems.
- Switch data modeling based on the IEC 61850-90-4 standard.
- Automatic warning by exception through email, relay output.
- Configurable via web browser, CLI, Windows utility, and ABC-02 automatic backup configurator.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX

Software Features

Management: IPv4/IPv6, PRP/HSR, SNMPv1/v2c/v3, DHCP Client, BootP, SMTP, RARP, HTTP, Telnet, LLDP, Flow Control, Back Pressure Flow Control, SNMP Inform, Port Mirror, Fiber Check, Syslog, RMON
Filter: Multicast Filter Behavior
Redundancy Protocols: PRP/HSR, RSTP Transparent
Security: RADIUS, TACACS+, Trusted Access Control, Authentication Certificate (SSL Certificate, SSH Key Regenerate)
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP
Industrial Protocols: Modbus/TCP
MIB: IEC 62439-3 MIB
Power Substation: MMS

Interface

Gigabit Ethernet: 3 x 10/100/1000BaseT(X) ports or 100/1000BaseSFP combo ports
Console Port: Ethernet console (10/100/1000 Mbps RJ45), USB-serial console (Type B connector)
Storage Port: USB storage (Type A connector for ABC-02-USB)
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 1 input with the same ground, but electrically isolated from the electronics
• +13 to +30 V for state “1”
• -30 to +3 V for state “0”
• Max. input current: 8 mA

Power Requirements

Input Voltage:
• WV: 24/48 VDC
• HV: 110/220 VDC/VAC
Operating Voltage:
• WV: 18 to 72 VDC
• HV: 88 to 300 VDC, 85 to 264 VAC
Input Current:
• Max. 0.660/0.360 A @ 24/48 VDC
• Max. 0.150/0.080 A @ 110/220 VDC
• Max. 0.260/0.170 A @ 110/220 VAC
Overload Current Protection: Present
Connection: 5-pin terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Aluminum alloy
IP Rating: IP40 protection
Dimensions: 80 x 160 x 110 mm (3.15 x 6.30 x 4.33 in)
Weight: 1210 g (2.69 lb)
Installation: DIN-rail mounting

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

High Availability Automation Networks: IEC 62439-3
Safety: UL 508
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 35 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
IEC 61000-4-11
Rail Traffic: EN 50121-4
Electrical Substation: IEC 61850-3, IEEE 1613

MTBF (mean time between failures)

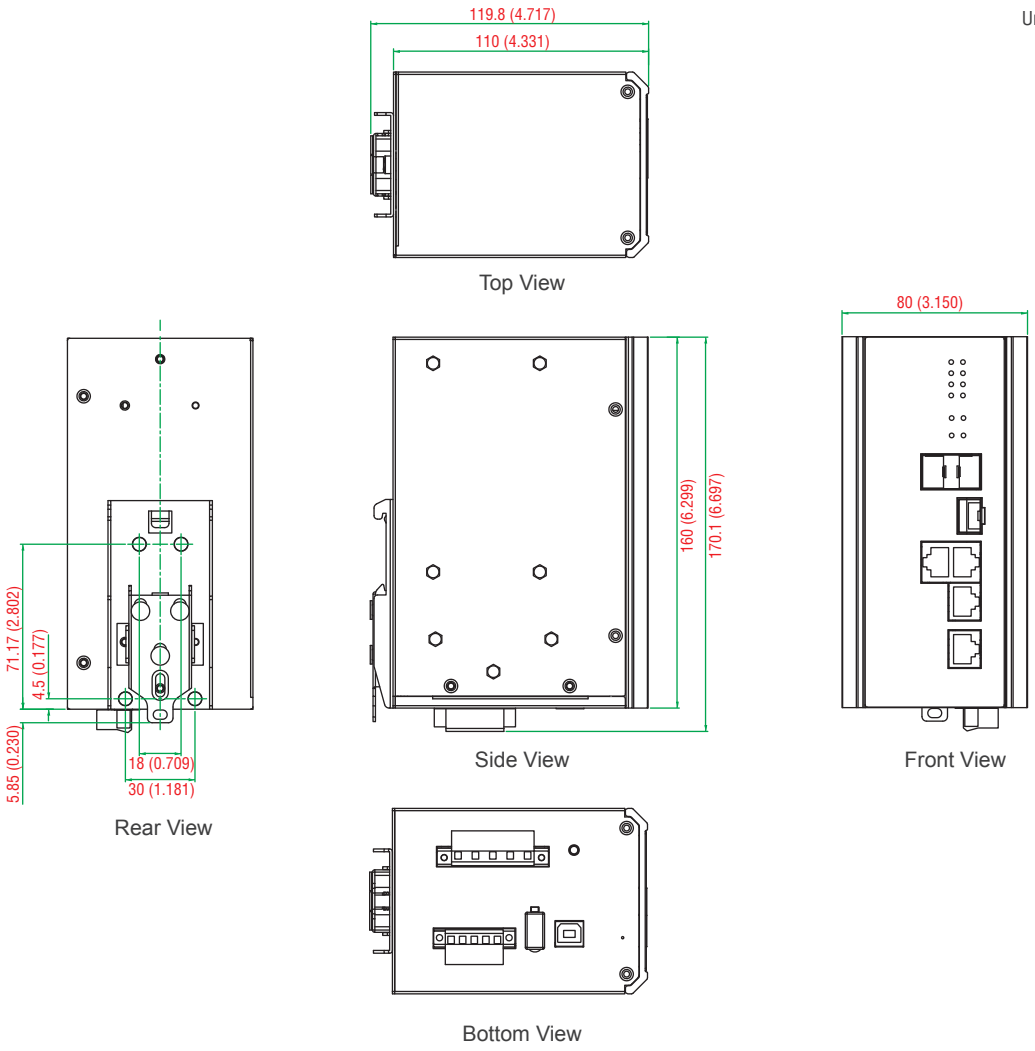
Time:
PT-G503-PHR-PTP-WV:440,857 hrs
PT-G503-PHR-PTP-HV:566,844 hrs
Standard: Telcordia TR/SR

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models		
DIN Rail, Front Cabling, Front Display	Power Supply	
	WV: 24/48 VDC (18 to 72 VDC), isolated (dual power inputs)	HV: 110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC), isolated (dual power inputs)
PT-G503-PHR-PTP-WV	1	–
PT-G503-PHR-PTP-HV	–	1

Optional Accessories (can be purchased separately)

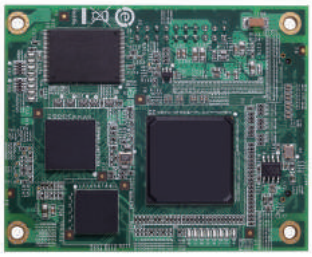
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-02 Series: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- PT-G503-PHR-PTP redundancy box
- USB Cable: CBL-USBA/B-100
- DIN-rail kit or wall-mounting ears (optional)
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide
- Warranty card

EOM-G103-PHR-PTP Series

IEC 62439-3 3-port full Gigabit embedded managed redundancy modules



- **IEC 62439-3 Clause 4 (PRP) and Clause 5 (HSR) compliant**
- **3 SGMII pinouts reserved for PRP/HSR (LAN A/LAN B/Inter Link) and an extra 1 SGMII reserved for Ethernet console connection**

Introduction

The EOM-G103-PHR-PTP series full Gigabit managed redundancy modules are designed for device manufacturers who would like to embed and integrate the advanced IEC 62439-3 supported modules with minimum effort into their products to enhance performance and reliability of certain mission-critical applications.

IEC 62439-3 Clause 4 (PRP) and IEC 62439-3 Clause 5 (HSR) are the newest standardized redundancy protocols for industrial automation networks where zero recovery time is needed. PRP and HSR are suitable for electrical substation automation and other mission-critical applications that cannot tolerate any system downtime.

The EOM-G103-PHR-PTP series modules are compliant with the latest IEC 62439-3 standards and provide an easy and cost-effective integrated solution for adding a redundancy module to a non-IEC 62439-3 supported product. The modules support two IEC 62439-3 Ethernet ports for constructing PRP or HSR networks: SGMII (MAC mode) / SERDES (1000BaseX). It also includes one standard Ethernet port SGMII (MAC mode) / SERDES (1000BaseX) for connecting with standard IEEE 802.3 Ethernet devices. Additionally, the EOM-G103-PHR-PTP series provides an extra SGMII (MAC mode) / SERDES (1000BaseX) for building up a local access Ethernet console port to easily maintain, control, and manage devices at the local site.

General Features and Benefits

- PRP (Parallel Redundancy Protocol): Transmit or receive two independent active paths to/from different LANs simultaneously in a zero recovery time network.
- HSR (High-availability Seamless Redundancy): Every frame is duplicated and then transmitted in both directions of the HSR ring to deliver zero switchover time.
- Hardware-based IEEE 1588v2 PTP (Precision Time Protocol) end-to-end one-step transparent clock for precise time synchronization of networks.
- Configurable via CLI.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX

Software Features

Management: IPv4 / IPv6, SNMP v1/v2c/v3, Telnet/SSH, LLDP, Flow Control, Back Pressure Flow Control, Port Mirror, Fiber Check, Syslog, RMON
Filter: Multicast Filter Behavior
Redundancy Protocols: PRP/HSR, RSTP Transparent
Security: RADIUS, TACACS+, Trusted Access Control, Authentication Certificate (SSL Certificate, SSH Key Regenerate)
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP
Industrial Protocols: Modbus/TCP
Power Substation: MMS

Interface

Ethernet Ports: 3, SGMII (MAC mode) / SERDES (1000BaseX) (PRP/HSR LAN A/LAN B/INTERLINK)
Connectors: 1 connector with 2 x 40 pins, and 1 connector with 2 x 10 pins
Console Port: Ethernet console (SGMII (MAC mode) / SERDES (1000BaseX))
GPIO: 3 programmable I/O pins

Power Requirements

Input Current: Max. 1.625 W @ 3.3 V

Physical Characteristics

Dimensions: 80 x 1.6 x 65 mm (3.15 x 0.06 x 2.56 in)
Weight: 28.6 g (0.06 lb)

Environmental Limits

Operating Temperature: -40 to 60°C (-40 to 140°F)
Note: Products with a higher operating temperature are available by special request.
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

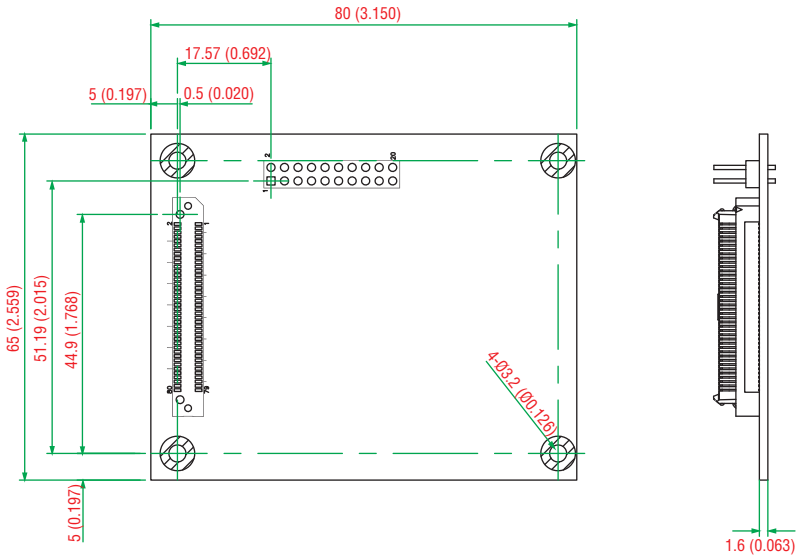
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A, CE Class A
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Pin Assignment

Pin assignment table for JP1 (2 x 40)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	GND	41	PRP_LED	42	DI
3	DTR(UART)	4	DCD(UART)	43	FAULT_LED	44	Reserved
5	RTS(UART)	6	DSR(UART)	45	STAT_R_LED	46	Reserved
7	TXD(UART)	8	CTS(UART)	47	STAT_G_LED	48	Reserved
9	GND	10	RXD(UART)	49	TX_DIS_G3(SFP)	50	GND
11	GXB_RX_P_0(SGMII)	12	GND	51	PRESENT_G3(SFP)	52	Reserved
13	GXB_RX_N_0(SGMII)	14	GXB_TX_P0(SGMII)	53	LOS_G3(SFP)	54	Reserved
15	GND	16	GXB_TX_N0(SGMII)	55	TX_DIS_G2(SFP)	56	GND
17	GXB_RX_P_1(SGMII)	18	GND	57	PRESENT_G2(SFP)	58	SDA-(I2C)
19	GXB_RX_N_1(SGMII)	20	GXB_TX_P1(SGMII)	59	LOS_G2(SFP)	60	SCK-(I2C)
21	GND	22	GXB_TX_N1(SGMII)	61	TX_DIS_G1(SFP)	62	GND
23	GXB_RX_P_2(SGMII)	24	GND	63	PRESENT_G1(SFP)	64	MDIO-PHY(SMI)
25	GXB_RX_N_2(SGMII)	26	GXB_TX_P2(SGMII)	65	LOS_G1(SFP)	66	MDC-PHY(SMI)
27	GND	28	GXB_TX_N2(SGMII)	67	TX_DIS_G0(SFP)	68	GND
29	GXB_RX_P_3(SGMII)	30	GND	69	PRESENT_G0(SFP)	70	Reserved
31	GXB_RX_N_3(SGMII)	32	GXB_TX_P3(SGMII)	71	LOS_G0(SFP)	72	Reserved
33	GND	34	GXB_TX_N3(SGMII)	73	Reserved	74	GND
35	COUP_LED	36	GND	75	Reserved	76	USB-HOST-DP
37	QB_LED	38	DO(1)	77	Reserved	78	USB-HOST-DM
39	HSR_LED	40	DO(0)	79	Reserved	80	GND

Pin assignment table for JP2 (2 x 10)

Pin	Signal	Pin	Signal
1	Reserved	2	Reserved
3	Reserved	4	Reserved
5	Reserved	6	Reserved
7	3.3V	8	3.3V
9	3.3V	10	3.3V
11	3.3V	12	GND
13	GND	14	GND
15	GND	16	GND
17	Reset_PHY	18	Reset
19	Reserved	20	Reset to Default

Starter Kit

The EOM Starter Kit includes an evaluation board, power adapter, software CD, and USB-IF certified cable to allow quick and easy evaluation of all embedded redundancy module functions. The evaluation board is equipped with 3 10/100/1000BaseT(X) and 100/1000BaseSFP slot combo ports.

Ordering Information

Available Modules

EOM-G103-PHR-PTP: IEC 62439-3 managed redundancy module with 3 SGMII pinouts reserved for 2 IEC 62439-3 ports and 1 standard Ethernet port, with an extra 1 SGMII reserved for Ethernet console connection, 3.3 V operating power input voltage, -40 to 85°C operating temperature

Optional Starter Kits (must be purchased separately)

EOM-G103-PHR-PTP-ST: Includes an EOM-G103-PHR-PTP managed redundancy module and an evaluation board with 3 10/100/1000BaseT(X) and 100/1000BaseSFP slot combo ports for testing and application development

Package Checklist (modules)

- EOM-G103-PHR-PTP module
- Developer's guide

Package Checklist (starter kits)

- EOM-G103-PHR-PTP module
- EOM-G103-PHR-PTP evaluation board
- USB Cable: CBL-USBA/B-100
- Universal power adapter
- 2 power cords (US or Euro plug)
- Developer's guide

Ethernet Media Converters and Extenders

Product Selection Guide

Chassis Media Converters 3-2
Ethernet-to-Fiber Media Converters 3-3
Managed DSL Ethernet Extenders 3-4

Chassis Media Converters

TRC-190 Series: Rackmount chassis for the NRack System™ 3-5
CSM-200 Series: 10/100BaseT(X) to 100BaseFX slide-in modules for the NRack System™ 3-7

Ethernet-to-Fiber Media Converters

PTC-101 Series: IEC 61850-3 and railway Ethernet-to-fiber media converters 3-9
IMC-P101 Series: IEEE 802.3af PoE Ethernet-to-fiber media converters 3-12
IMC-101G Series: Industrial gigabit Ethernet-to-fiber media converter 3-14
IMC-101 Series: Industrial Ethernet-to-fiber media converters 3-16
IMC-21A Series: Industrial 10/100BaseT(X) to 100BaseFX media converters 3-18
IMC-21 Series: Entry-level industrial 10/100BaseT(X) to 100BaseFX media converters 3-20
IMC-21GA Series: Industrial gigabit Ethernet-to-fiber media converter 3-22

Managed DSL Ethernet Extenders

IEX-402 Series: Managed DSL Ethernet extenders 3-24
IEX-408E-2VDSL2 Series: Industrial managed 6 FE + 2 VDSL2 Ethernet extender 3-26

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Ethernet Media Converters and Extenders

Chassis Media Converters

	TRC-190-AC TRC-190-DC-48	CSM-200-1213 CSM-200-1214	CSM-200-1218
Optical Fiber Interface			
Fiber Connector	–	SC or ST	SC
Cable Requirements	–	Multi-mode: 50/125, 62.5/125, or 100/140 µm	Single-mode: 8.3/125, 8.7/125, 9/125, or 10/125 µm
Transmission Distance	–	5 km	40 km
Wavelength	–	1300 nm	1310 nm
Tx Output	–	-10 to -20 dBm	0 to -5 dBm
Rx Sensitivity	–	-32 dBm	-34 dBm
Point-to-Point Transmission	–	Point-to-Point Transmission: Half-duplex or full-duplex	Point-to-Point Transmission: Half-duplex or full-duplex
Fast Ethernet Interface			
Connector	–	RJ45	
Speed	–	10/100BaseT(X)	
Physical Characteristics			
Housing	SECC (1.2 mm)	–	
Dimensions (mm)	440 x 260 x 77 mm (18.6 x 11 x 3.3 in)	86.8 x 136.5 x 21 mm (3.42 x 4.89 x 0.83 in)	
Weight	5.2 kg (11.4 lb), with one power module installed	CSM-200-1213: 115 g (0.25 lb) CSM-200-1214: 125 g (0.28 lb)	125 g (0.28 lb)
Number of Slots	19 slots in the front for slide-in modules, 2 slots in the back for power supply modules	–	
Environmental Limits			
Operating Temperature	0 to 60°C (32 to 140°F)	0 to 60°C (32 to 140°F)	
Ambient Relative Humidity	5 to 95% (non-condensing)		
Storage Temperature	-40 to 85°C (-40 to 185°F)		
Power Requirements			
Input Voltage	100 to 240 VAC or 36 to 72 VDC	12 VDC	
Input Current	3.2 A @ 36 VDC	180 mA @ 12 VDC	
Standards and Certifications			
Safety	UL 60950-1		
EMC	EN 55022/24		
EMI	CISPR 22, FCC Part 15B Class A		
EMS	EN 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m EN 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV EN 61000-4-5 Surge: Power: 1 kV; Signal: 0.5 kV EN 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m EN 61000-4-8 PFMF EN 61000-4-11	EN 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m EN 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV EN 61000-4-5 Surge: Power: 1 kV; Signal: 0.5 kV EN 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m EN 61000-4-8 PFMF EN 61000-4-11	
Freefall	–	IEC 60068-2-32	
MTBF	Time: 1,055,112 hrs Standard: Telcordia (Bellcore), GB	Time: 1,454,560 hrs Standard: Telcordia (Bellcore), GB	
Reliability			
Warranty	5 years (see www.moxa.com/warranty)		
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Ethernet-to-Fiber Media Converters

	PTC-101 Series (LV models)	PTC-101 Series (HV models)	IMC-P101 Series	IMC-101G Series	IMC-21GA Series	IMC-101 Series	IMC-21A Series	IMC-21 Series
IEEE Standards								
IEEE 802.3af	–	–	✓	–	–	–	–	–
Interface								
RJ45 Ports	10/100BaseT(X)			10/100/1000BaseT(X)	10/100/1000BaseT(X), auto MDI/MDI-X	10/100BaseT(X)		
M12 Port	✓	–	–	–	–	–	–	–
Fiber Modes	Multi-mode Fiber / Single-mode Fiber			Multi-mode Fiber / Single-mode Fiber				
Fiber Ports	100BaseFX (SC, ST, or LC connectors)		100BaseFX (SC or ST connectors)	Optional 1000BaseSX/ LSX/LX/LH/LHX/ZX/EZX (LC connector)	100/1000BaseSX/LX or 100/1000BaseSFP slot	100BaseFX (SC or ST connectors)	100BaseFX (SC or ST)	
LED Indicators	PWR1, PWR2, Fiber Link/ Act, 10/100M (TP port)	PWR, Fiber Link/Act, 10/100M (TP port)	PWR1, PWR2, Fiber Link/ Act, PSE Indicator, 10/100M (TP port)	PWR1, PWR2, FAULT, 10/100M (TP port), 1000M (TP and Fiber port)	PWR1, PWR2, G1 (copper port 10M/100M/1000M), G2 (fiber port 100M/1000M), 10/100M (TP port), 1000M (TP and Fiber port)	PWR1, PWR2, FAULT, 10/100M (TP port), 100M (Fiber port), FDX/ COL (Fiber port)	Power, 10/100M (TP port), 100M (fiber port), FDX/ COL (fiber port)	
DIP Switches	Auto Negotiation, Force TP Speed, Force TP Duplex, Link Fault Pass Through, Operating Mode		Auto Negotiation, Force TP Speed, Force TP Duplex, Link Fault Pass Through, Operating Mode, PSE, P.R.R. (PD Remote Reset)	Port break alarm, Fault Pass-Through, Fiber AN/ Force	Fiber speed 100M/1000M, Link Fault Pass-through, Energy Efficient Ethernet	100BaseFX Full/Half duplex selection, Port break alarm	TP port's 10/100M, Half/Full modes, and Force/Auto modes, fiber connection's Full/Half mode, Link Fault Pass-Through (LFP)	
Alarm Contact	Relay output: 1 A @ 24 VDC						–	
Multi-mode Transmission Distance								
1000BaseSX	–			See SFP-1G series datasheet	See SFP-1G series datasheet (IMC-21GA-SX-SC) 100/1000BaseSX: 0 to 500 m, 850 nm (50/125 µm, 400 MHz*km)	–		
1000BaseLX	–			See SFP-1G series datasheet	See SFP-1G series datasheet	–		
Single-mode Transmission Distance								
1000BaseLX	–			See SFP-1G series datasheet	See SFP-1G series datasheet (IMC-21GA-LX-SC) 100/1000BaseLX: 0 to 10 km, 1310 nm (9/125 µm, 3.5 PS/(nm*km)	–		
1000BaseLHX	–			See SFP-1G series datasheet	See SFP-1G series datasheet	–		
1000BaseZX	–			See SFP-1G series datasheet	See SFP-1G series datasheet	–		
Physical Characteristics								
Housing	Metal (IP30)							Plastic (IP30)
Dimensions (mm)	66.65 x 135.1 x 101.4 mm (5.99 x 4.86 x 2.62 in)	66.65 x 135.1 x 101.4 mm (5.99 x 4.86 x 2.62 in)	51.65 x 144.45 x 110.2 mm (2.03 x 5.69 x 4.34 in)	53.6 x 135 x 105 mm (2.11 x 5.32 x 4.13 in)	30 x 125 x 79 mm (1.19 x 4.92 x 3.11 in)	53.6 x 135 x 105 mm (2.11 x 5.32 x 4.13 in)	30 x 125 x 79 mm (1.19 x 4.92 x 3.11 in)	25 x 109 x 97 mm (0.98 x 4.29 x 3.82 in)
Weight	690 g (1.52 lb)	690 g (1.52 lb)	525 g (1.16 lb)	630 g (1.39 lb)	170 g (0.37 lb)	630 g (1.39 lb)	170 g (0.37 lb)	125 g (0.27 lb)
Installation	DIN-rail mounting, wall mounting (with optional kit)						DIN-rail mounting	
Environmental Limits								
Operating Temperature	-40 to 85°C (-40 to 185°F)		Standard Models: 0 to 60°C (32 to 140°F) Wide Temp. Models: -40 to 75°C (-40 to 167°F)					-10 to 60°C (14 to 140°F)
Operating Humidity	5 to 95% (non-condensing)							
Storage Temperature	-40 to 85°C (-40 to 185°F)						-40 to 75°C (-40 to 167°F)	-40 to 70°C (-40 to 158°F)
Power Requirements								
Input Voltage	20 to 72 VDC	85 to 264 VAC 88 to 300 VDC	48 VDC (46 to 57 VDC), redundant inputs	12 to 45 VDC redundant inputs	12 to 48 VDC redundant inputs	12 to 45 VDC redundant inputs	12 to 48 VDC	
Input Current	170 mA @ 20 VDC	73 mA @ 85 VAC 47 mA @ 88 VDC	130 mA @ 46 VDC	220 mA @ 12 VDC	285 mA @ 12 VDC	320 mA @ 12 VDC	265 mA @ 12 VDC	300 mA @ 12 VDC
Connection	Removable terminal block							
Overload Current Protection	1.6 A	1.6 A	1.6 A	2.5 A	1.5 A	1.1 A	1.1 A	1.1 A
Reverse Polarity Protection	✓	✓	✓	✓	✓	✓	✓	✓
PoE	–	–	PSE, provides up to 15.4 W for PD	–	–	–	–	–
Standards and Certifications								
Safety	UL 60950-1	UL 60950-1	UL 508	UL 508	UL 60950-1	UL 508, UL 60950-1	UL 60950-1	UL 508
EMI	CISPR 22, FCC Part 15B Class A			CISPR 22, FCC Part 15B Class A				
EMS	EN 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m EN 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV EN 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV EN 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m EN 61000-4-8 PFMF EN 61000-4-11		EN 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m EN 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV EN 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV EN 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m EN 61000-4-8 PFMF EN 61000-4-11	EN 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m EN 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV EN 61000-4-5 Surge: Power: 1 kV; Signal: 1 kV EN 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m EN 61000-4-8 PFMF EN 61000-4-11	EN 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m EN 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV EN 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV EN 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m EN 61000-4-8 PFMF EN 61000-4-11	EN 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m EN 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV EN 61000-4-5 Surge: Power: 1 kV; Signal: 1 kV EN 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m EN 61000-4-8 PFMF EN 61000-4-11	EN 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 1 V/m EN 61000-4-4 EFT: Power: 1 kV; Signal: 1 kV EN 61000-4-5 Surge: Power: 1 kV; Signal: 1 kV EN 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m EN 61000-4-8 PFMF EN 61000-4-11	EN 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 1 V/m EN 61000-4-4 EFT: Power: 1 kV; Signal: 1 kV EN 61000-4-5 Surge: Power: 1 kV; Signal: 1 kV EN 61000-4-6 CS: 150 kHz to 80MHz: 3 V/m EN 61000-4-8 PFMF EN 61000-4-11
Hazardous Location	–	–	–	UL/cUL Class1, Division 2, Groups A, B, C, and D, ATEX Class1, Zone 2, Ex nC IIC	–	UL/cUL Class1, Division 2, Groups A, B, C, and D, ATEX Class1, Zone 2, Ex nC IIC	–	–
Electrical Substation	IEC 61850-3, IEEE 1613	IEC 61850-3, IEEE 1613	–	–	–	–	–	–
Rail Traffc	EN 50121-4	EN 50121-4	–	–	–	–	–	–
Freefall	IEC 60068-2-32							
Shock	IEC 60068-2-27							
Vibration	IEC 60068-2-6							
Maritime	–	–	–	–	–	DNV, GL	–	–
MTBF	Time: 1,211,613 hrs Standard: Telcordia (Bellcore), GB	Time: 1,211,613 hrs Standard: Telcordia (Bellcore), GB	Time: 435,210 hrs Standard: Telcordia (Bellcore), GB	Time: 500,540 hrs Standard: Telcordia (Bellcore), GB	Time: 2,573,203 hrs Standard: Telcordia (Bellcore), GB	Time: 401,000 hrs Standard: MIL-HDBK-217F	Time: 353,000 hrs Standard: MIL-HDBK-217F	Time: 353,000 hrs Standard: MIL-HDBK-217F
Reliability								
Warranty	5 years (see http://www.moxa.com/warranty)							
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Managed DSL Ethernet Extenders

Preliminary

	IEX-408E-2VDSL2	IEX-402-SHDSL	IEX-402-VDSL2
Number of Ports			
Fast Ethernet, 10/100 Mbps	6	1	1
DSL Port	2	1	1
Available Power Input			
12/24/48 VDC	✓	✓	✓
110/220 VDC/VAC	✓	–	–
Installation Options			
DIN-Rail Mounting	✓	✓	✓
Panel Mounting	w/ optional kit	w/ optional kit	w/ optional kit
Rack Mounting	w/ optional kit	w/ optional kit	w/ optional kit
Supported Operating Temperatures			
-10 to 60°C	✓	✓	✓
-40 to 75°C	✓	✓	✓
Redundancy and Backup Options			
Turbo Ring	✓	–	–
Turbo Chain	✓	–	–
STP/RSTP	✓	–	–
MSTP	✓	–	–
Automatic Backup Configurator (ABC-01)	–	✓	✓
Automatic Backup Configurator (ABC-02)	✓	–	–
Network Management and Control			
SNMP v1/v2c/v3	✓	✓	✓
LLDP	✓	✓	✓
IPv6	✓	✓	✓
Layer 3 Switching	–	–	–
Port Trunking	✓	–	–
Modbus/TCP	✓	–	–
Ethernet/IP	✓	–	–
PROFINET	✓	–	–
SNMP/RMON	✓	–	–
DHCP Option 66/67/82	✓	–	–
IGMP Snooping/GMRP	✓	–	–
QoS	✓	–	–
IEEE 802.1Q VLAN	✓	–	–
Port-based VLAN	✓	–	–
IEEE 802.1X	✓	–	–
Port Lock	✓	–	–
Relay Warning	✓	–	–
Maximum Support Speed / Distance over Twisted-Pair Copper Wire			
100 Mbps / 3 km	✓	–	✓
15.3 Mbps / 8 km	–	✓	–
Standards and Certifications			
CE/FCC	✓	✓	✓
UL 61010-2-201	✓	–	–
EN 60950-1 (LVD)	✓	–	–
UL 508	–	✓	✓
NEMA TS2	✓	–	✓
EN 50121-4	✓	✓	✓
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TRC-190 Series

Rackmount chassis for the NRack System™

- 19-inch chassis for rackmount use
- 19 slots for high density applications
- Supports hot-swap and dual power input with redundancy
- Fanless chassis design reduces servicing costs

Introduction

The TRC-190 series provides 19 slots for media converter modules from the CSM-200 series of Ethernet-to-fiber modules and TCF-142-RM series of serial-to-fiber modules. A TRC-190 chassis comes with one AC or DC power input, with an optional redundant power expansion module available for greater reliability. The TRC-190 series' power input module supports the hot-swap feature.

Specifications

Physical Characteristics

Housing: SECC (1.2 mm)
Dimensions: 440 x 260 x 77 mm (18.6 x 11 x 3.3 in)
Weight: 5.2 kg (11.4 lb), with one power module installed
Number of Slots: 19 slots on the front for slide-in modules, 2 slots at the back for power supply modules

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -20 to 75°C (-4 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: Universal 100 to 240 VAC (47 to 63 Hz) or ±48 VDC (36 to 72 VDC and -36 to -72 VDC) or 220 VDC
Input Current:
3.2 A @ 36 VDC max.

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: CE, FCC
EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS:
EN 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
EN 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
EN 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
EN 61000-4-5 Surge: Power: 1 kV; Signal: 0.5 kV
EN 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m
EN 61000-4-8 PFMF
EN 61000-4-11
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

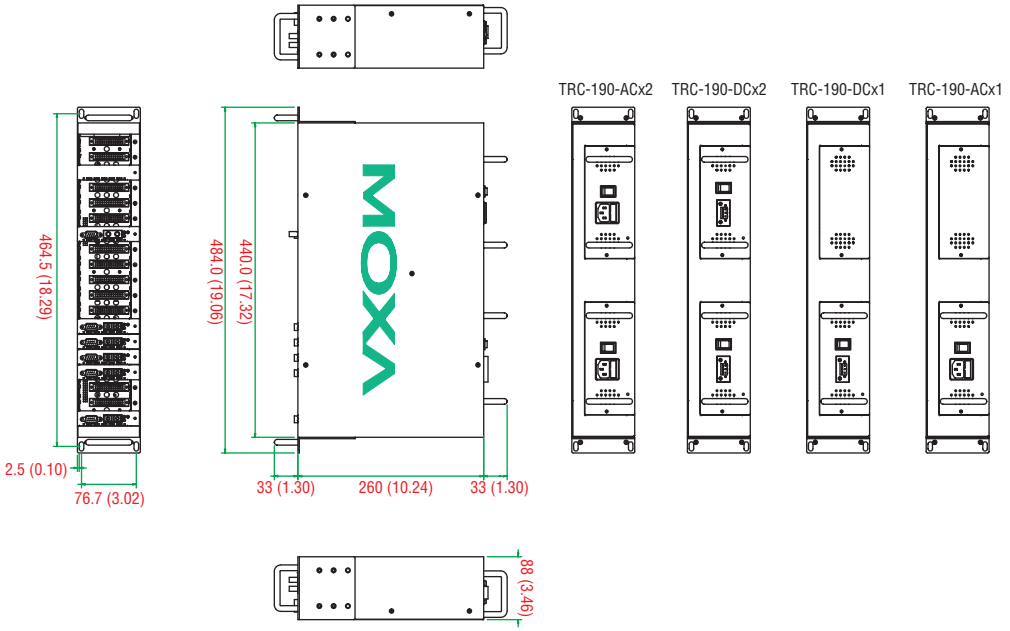
Time: 1,055,112 hrs
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

TRC-190-AC: Rack chassis, 2U, single 110 to 240 VAC input, with 19 slots on front panel
TRC-190-DC-48: Rack chassis, 2U, single 36 to 72 VDC input, with 19 slots on front panel

Available Slide-in Modules

CSM-200-1213: 10/100BaseT(X) to 100BaseFX slide-in module media converter, multi-mode ST connector
CSM-200-1214: 10/100BaseT(X) to 100BaseFX slide-in module media converter, multi-mode SC connector
CSM-200-1218: 10/100BaseT(X) to 100BaseFX slide-in module media converter, single-mode SC connector
TCF-142-M-SC-RM: RS-232/422/485 to multi-mode fiber slide-in module converter, SC connector
TCF-142-M-ST-RM: RS-232/422/485 to multi-mode fiber slide-in module converter, ST connector
TCF-142-S-SC-RM: RS-232/422/485 to single-mode fiber slide-in module converter, SC connector
TCF-142-S-ST-RM: RS-232/422/485 to single-mode fiber slide-in module converter, ST connector

Optional Accessories (can be purchased separately)

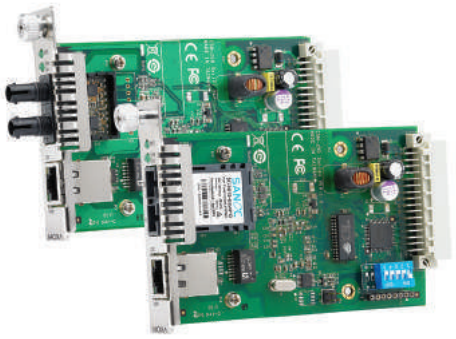
PWR-190-AC: 110 to 240 VAC power supply for the TRC-190-AC
PWR-190-DC-48: 36 to 72 VDC power supply for the TRC-190-DC-48
Plate-1: Face plate to cover unused front panel slots (required for all unused slots)

Package Checklist

- 1 TRC-190 with single power input
- Power cord (for the TRC-190-AC only)
- 17 face plates
- User's manual (printed)
- Warranty card

CSM-200 Series

10/100BaseT(X) to 100BaseFX slide-in modules for the NRack System™



- LFP (Link Fault Pass-through) and FEF (Far End Fault)
- Two different operation modes
  - Store-and-Forward
  - Pass Through
- Auto Negotiation
- Plug and Play
- Hot-swap

Introduction

The CSM-200/400 modules are slide-in Ethernet-to-fiber media converters for the NRack System™. The modules provide media conversion from 10/100BaseT(X) to 100BaseFX (SC/ST connectors), and can be installed in any NRack System™ chassis.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT,
IEEE 802.3u for 100BaseT(X), 100BaseFX

Interface

RJ45 Ports: 10/100BaseT(X)
Fiber Ports: 100BaseFX (SC/ST connectors)
LED Indicators: PWR, Fiber Link, 10/100M (TP port)
DIP Switches:

DIP	Function	ON	OFF
1	Auto Negotiation	Enable	Disable
2	Force TP Speed	100 Mbps	10 Mbps
3	Force TP Duplex	Full Duplex	Half Duplex
4	Link Fault Pass Through	Enable	Disable
5	Operating Mode	Store-and-Forward	Pass Through

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Physical Characteristics

Dimensions: 86.8 x 124.3 x 21 mm (3.42 x 4.89 x 0.83 in)
Weight:
Product only:
CSM-200-1213: 115 g (0.25 lb)
CSM-200-1214/1218: 125 g (0.28 lb)
Packaged:
CSM-200-1213: 170 g (0.37 lb)
CSM-200-1214/1218: 180 g (0.40 lb)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 75°C (-4 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 VDC
Input Current: 180 mA @ 12 VDC max.

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
EN 61000-4-2 (ESD): Contact: 4 kV; Air: 8 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 3 V/m
EN 61000-4-4 (EFT): Power: 1 kV; Signal: 0.5 kV
EN 61000-4-5 (Surge): Power: 1 kV; Signal: 0.5 kV
EN 61000-4-6 (CS): 150 kHz to 80 MHz: 3 V/m
EN 61000-4-8 (PFMF)
EN 61000-4-11
Freefall: IEC 60068-2-32

MTBF (mean time between failures)

Time: 1,454,560 hrs
Standard: Telcordia (Bellcore), GB

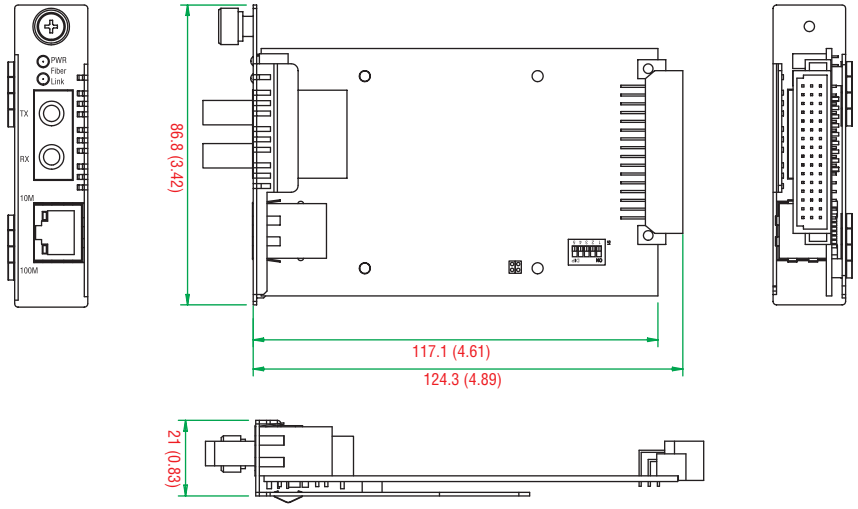
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

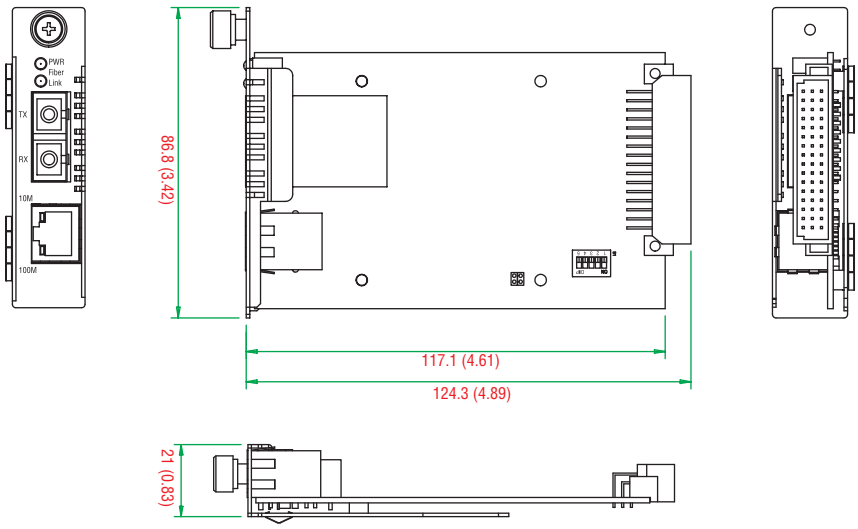
Dimensions

Unit: mm (inch)

CSM-200-1213



CSM-200-1214/CSM-200-1218



Ordering Information

Available Models

CSM-200-1213: 10/100BaseT(X) to 100BaseFX slide-in module media converter, multi-mode ST connector
CSM-200-1214: 10/100BaseT(X) to 100BaseFX slide-in module media converter, multi-mode SC connector
CSM-200-1218: 10/100BaseT(X) to 100BaseFX slide-in module media converter, single-mode SC connector

Package Checklist

- 1 CSM-200 media converter
- Quick installation guide (printed)
- Warranty card

PTC-101 Series

IEC 61850-3 and railway Ethernet-to-fiber media converters

- 10/100BaseT(X) auto-negotiation and auto-MDI/MDI-X
- Link Fault Pass-Through (LFP)
- Power failure alarm by relay output (LV model only)
- -40 to 85°C operating temperature range
- Redundant dual DC power inputs (LV model only)
- Integrated high-reliability power supply eliminates the need for external power transformer
- Compliant with EN 50121-4
- Essential compliance with EN 50155*

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

EN 50121 EN 50155 IEC 61850-3 IEEE 1613 RoHS c UL us LISTED CE FC

Introduction

The PTC-101 Ethernet-to-fiber media converters convert from 10/100BaseT(X) to 100BaseFX. Models are available with either SC, ST, or LC connectors. The PTC-101 converters eliminate the need for additional wiring, and support IEEE 802.3 and IEEE 802.3u/x protocols with 10/100M, full/half-duplex, and MDI/MDI-X auto-sensing to provide a total solution for your industrial Ethernet networks. The PTC-101 is compliant with essential sections of EN 50155, covering operating temperature, power input voltage, surge, ESD, and vibration, as well as conformal coating and power insulation, making the switches suitable for a variety of industrial applications.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X), 100BaseFX

Interface

RJ45/M12 Ports: 10/100BaseT(X)
Fiber Ports: 100BaseFX (SC/ST/LC connectors)
LED Indicators: PWR1, PWR2, Fiber Link, 10/100M (TP port)
DIP Switches:

DIP No.	Function	ON	OFF
1	Auto Negotiation	Enable	Disable
2	Force TP Speed	100 Mbps	10 Mbps
3	Force TP Duplex	Full Duplex	Half Duplex
4	Link Fault Pass Throuth	Enable	Disable
5	Operating Mode	Store-and-Forward	Pass Through

The default setting for all DIP switches is ON.

Alarm Contact: One relay output with current carrying capacity of 1 A @ 24 VDC (LV model only)

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 152.15 x 123.46 x 66.65 mm (5.99 x 4.86 x 2.62 in)
Weight:
Product only: 690 g (1.52 lb)
Packaged: 875 g (1.92 lb)

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Conformal Coating: Available upon request

Power Requirements

Input Voltage:

Power Supply Type		Power Consumption	Fuse Rating
LV-DC	20 to 72 VDC	170 mA @ 20 VDC	3.15A(T) 2
HV-AC	85 to 264 VAC	73 mA @ 85 VAC	3.15A(T) 2
HV-DC	88 to 300 VDC	47 mA @ 88 VDC	3.15A(T) 2
V-DC compliant with EN 50155 on 48 VDC HV-DC compliant with EN 50155 on 110 VDC			

Input Current:
LV-DC: 170 mA @ 20 VDC max.
HV-AC: 73 mA @ 85 VDC max.
HV-DC: 47 mA @ 88 VDC max.
Connection: Removable terminal block
Overload Current Protection: 1.6 A (protects against two signals shorted together)
Reverse Polarity Protection: Protects against V+/V- reversal

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A

EMS:
EN 61000-4-2 (ESD): Contact: 8 kV; Air: 15 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 3 V/m
EN 61000-4-4 (EFT): Power: 4 kV; Signal: 4 kV
EN 61000-4-5 (Surge): Power: 4 kV; Signal: 4 kV
EN 61000-4-6 (CS): 150 kHz to 80 MHz: 3 V/m
EN 61000-4-8 (PFMF)
EN 61000-4-11
Green Product: RoHS, CRoHS, WEEE
Note: Refer to the "Environmental Type Tests" table below for more detailed information.
Freefall: IEC 60068-2-32
Power Automation: IEC 61850-3, IEEE 1613
Rail Traffic: EN 50121-4
*Please contact Moxa or a Moxa distributor for details.
Vibration: IEC-61850-3, IEC-60870-2-2, EN 50125-3 (M12 models only)

MTBF (mean time between failures)

Time: 1,211,613 hrs
Standard: Telcordia (Bellcore), GB

Warranty

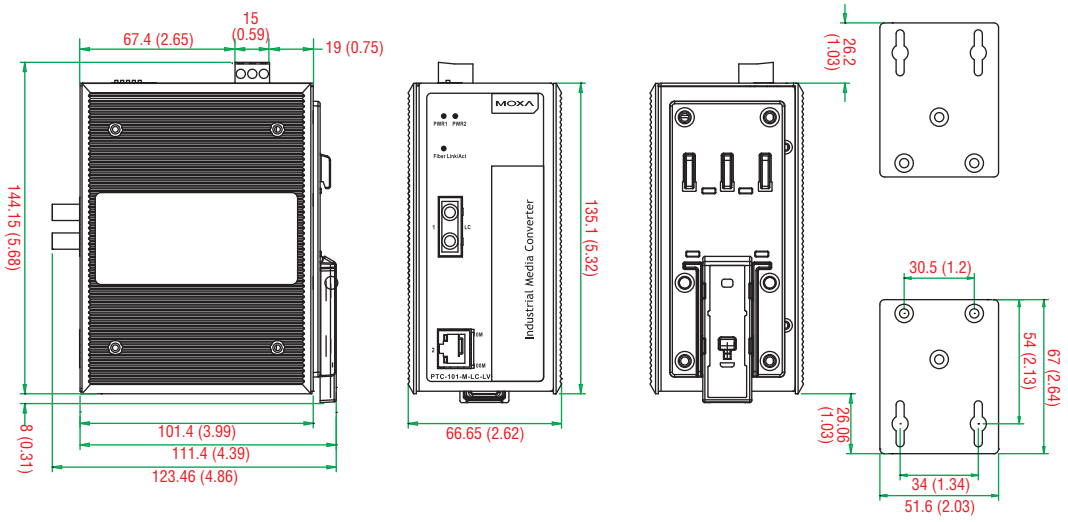
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Environmental Type Tests			
Test	**Description**		**Test Levels**
IEC 60068-2-1	Cold, operating (power ON/OFF)	Test Ad	-40°C, 48 hours
IEC 60068-2-3	Damp heat, steady state, operating	Test Ca	85°C, 95% R.H., 24 hours
IEC 60068-2-14	Changing temperature, operating	Test Nb	-40 to 85°C, Ramp rate: 3°C/min, 8 cycles
IEC 60068-2-48 IEC 60068-2-1	Cold, storage	Test Ad	-40°C, 12 hours
IEC 60068-2-48 IEC 60068-2-3	Damp heat, steady state, storage	Test Ca	90°C, 95% R.H., 24 hours
IEC 60068-2-32 ISTA-2A	Freefall, package	Test Ed	90 cm
IEC 60068-2-34	Random vibration, package	Test Fd	3 grms (5 to 500 Hz)
IEC 61850-3 IEC 60870-2-2 IEC 60068-2-6 IEC 60721-3-3	Vibration, operating	Class Cm (3M6, 4M6)	20 m/s² (9 to 200 Hz) 15 m/s² (200 to 500 Hz)
IEC 61850-3 IEC 60870-2-2 IEC 60068-2-27 IEC 60721-3-3	Shock, operating	Class Cm (3M6, 4M6)	300 m/s², 11 ms

Dimensions

Unit: mm (inch)

PTC-101-M-ST-HV (other models available by request)

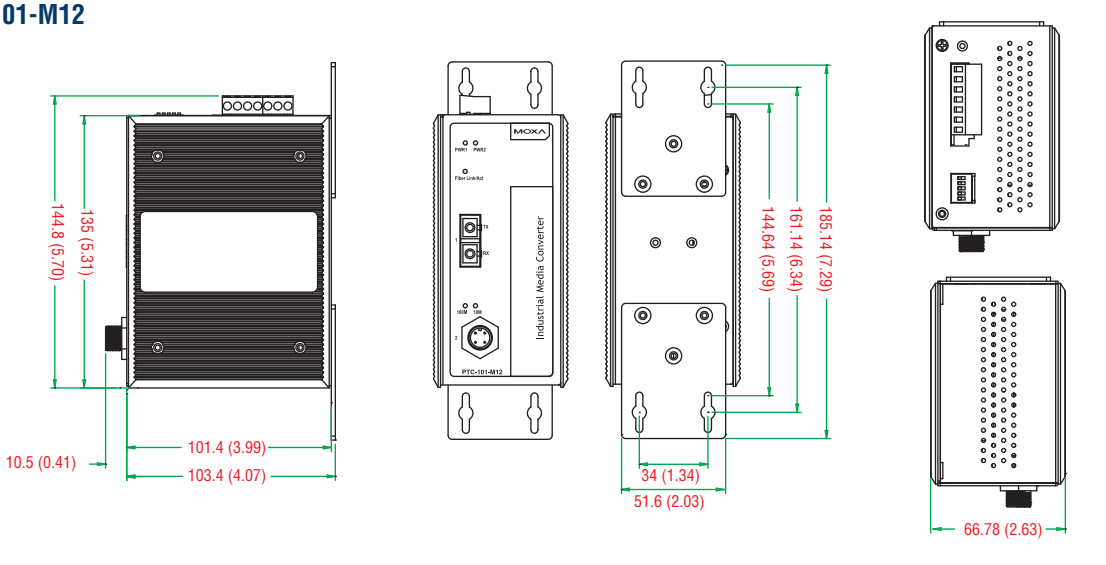


Side View | Front View | Rear View | Panel-Mounting Kit (Optional)

Dimensions

Unit: mm (inch)

PTC-101-M12



Side View | Front View | Panel-Mounting Kit (Optional) | Top & Bottom View

Ordering Information

Available Models

PTC-101-M-SC-LV: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode with SC connector, dual redundant power inputs (20-72 VDC), -40 to 85°C operating temperature
PTC-101-M-ST-LV: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode with ST connector, dual redundant power inputs (20-72 VDC), -40 to 85°C operating temperature
PTC-101-M-LC-LV: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode with LC connector, dual redundant power inputs (20-72 VDC), -40 to 85°C operating temperature
PTC-101-S-SC-LV: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode with SC connector, dual redundant power inputs (20-72 VDC), -40 to 85°C operating temperature
PTC-101-S-ST-LV: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode with ST connector, dual redundant power inputs (20-72 VDC), -40 to 85°C operating temperature
PTC-101-S-LC-LV: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode with LC connector, dual redundant power inputs (20-72 VDC), -40 to 85°C operating temperature
PTC-101-M-SC-HV: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode with SC connector, 1 isolated power supply (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PTC-101-M-ST-HV: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode with ST connector, 1 isolated power supply (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PTC-101-M-LC-HV: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode with LC connector, 1 isolated power supply (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PTC-101-S-SC-HV: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode with SC connector, 1 isolated power supply (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PTC-101-S-ST-HV: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode with ST connector, 1 isolated power supply (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PTC-101-S-LC-HV: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode with LC connector, 1 isolated power supply (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PTC-101-M12-S-SC-LV-T: Industrial 10/100BaseT(X) to 100BaseFX media converter, M12 connector, single-mode with SC connector (20-72 VDC), -40 to 85°C operating temperature
PTC-101-M12-S-ST-LV-T: Industrial 10/100BaseT(X) to 100BaseFX media converter, M12 connector, single-mode with ST connector (20-72 VDC), -40 to 85°C operating temperature
PTC-101-M12-S-SC-LV-T-CT: Industrial 10/100BaseT(X) to 100BaseFX media converter, M12 connector, single-mode with SC connector (20-72 VDC), -40 to 85°C operating temperature, conformal coating
PTC-101-M12-S-ST-LV-T-CT: Industrial 10/100BaseT(X) to 100BaseFX media converter, M12 connector, single-mode with ST connector (20-72 VDC), -40 to 85°C operating temperature, conformal coating
Conformal coating: Available for PTC-101-M12 series

Package Checklist

- 1 PTC-101 media converter
- Hardware installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

WK-51: Wall-mounting kit
DK-DC50131: DIN-rail mounting kit
WK-51-01: DIN-rail/wall-mounting kit, 2 plates with 6 screws
DK-DC50131-01: DIN-rail mounting kit, 2 plates with 8 screws

IMC-P101 Series

IEEE 802.3af PoE Ethernet-to-fiber media converters

- 10/100BaseT(X) auto-negotiation and auto-MDI/MDI-X
- IEEE 802.3af compliant PoE PSE equipment
- Power failure alarm by relay output
- Store-and-forward mode and pass through mode
- -40 to 75°C operating temperature range (T models)
- Redundant dual DC power inputs

PoE Power over Ethernet

RoHS c UL us LISTED CE FC

Introduction

IMC-P101 series Ethernet-to-fiber media converters provide Ethernet media conversion from 10/100BaseT(X) to 100BaseFX (with SC or ST connectors). These converters are classified as power source equipment (PSE), and when used in this way provide up to 15.4 watts to IEEE 802.3af compliant powered devices (PDs), eliminating the need for additional wiring. The IMC-P101 converters support IEEE 802.3/802.3u/802.3x with 10/100M, full/half-duplex, and MDI/MDI-X auto-sensing, providing a complete solution for your industrial Ethernet network.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X), 100BaseFX
IEEE 802.3af for Power-over-Ethernet

Interface

RJ45 Ports: 10/100BaseT(X)
Fiber Ports: 100BaseFX (SC/ST connectors)
LED Indicators: PWR1, PWR2, Fiber Link, 10/100M (TP port), PSE Indicator
DIP Switches:

DIP No.	Function	ON	OFF
1	Auto Negotiation	Enable*	Disable
2	Force TP Speed	100 Mbps*	10 Mbps
3	Force TP Duplex	Full Duplex*	Half Duplex
4	Link Fault Pass Through	Enable*	Disable
5	Operating Mode	Store-and-Forward*	Pass Through
6	PSE	Disable	Enable*
7	P.R.R. (PD Remote Reset)	Enable	Disable*

* Default DIP switch setting.

Alarm Contact: One relay output with current carrying capacity of 1 A @ 24 VDC

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Physical Characteristics

Housing: Metal
Dimensions: 144.45 x 122.3 x 51.65 mm (5.69 x 4.81 x 2.03 in)
Weight:
Product only: 525 g (1.16 lb)
Packaged: 710 g (1.56 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 48 VDC (46 to 57 VDC), redundant inputs
Input Current: 130 mA @ 48 VDC max.
Connection: Removable terminal block
Overload Current Protection: 1.6 A (protects against two signals shorted together)
Reverse Polarity Protection: Protects against V+/V- reversal

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
EN 61000-4-2 (ESD): Contact: 8 kV; Air: 15 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 3 V/m
EN 61000-4-4 (EFT): Power: 4 kV; Signal: 4 kV
EN 61000-4-5 (Surge): Power: 2 kV; Signal: 2 kV
EN 61000-4-6 (CS): 150 kHz to 80 MHz: 3 V/m
EN 61000-4-8 (PFMF)
EN 61000-4-11
Green Product: RoHS, CRoHS, WEEE
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

MTBF (mean time between failures)

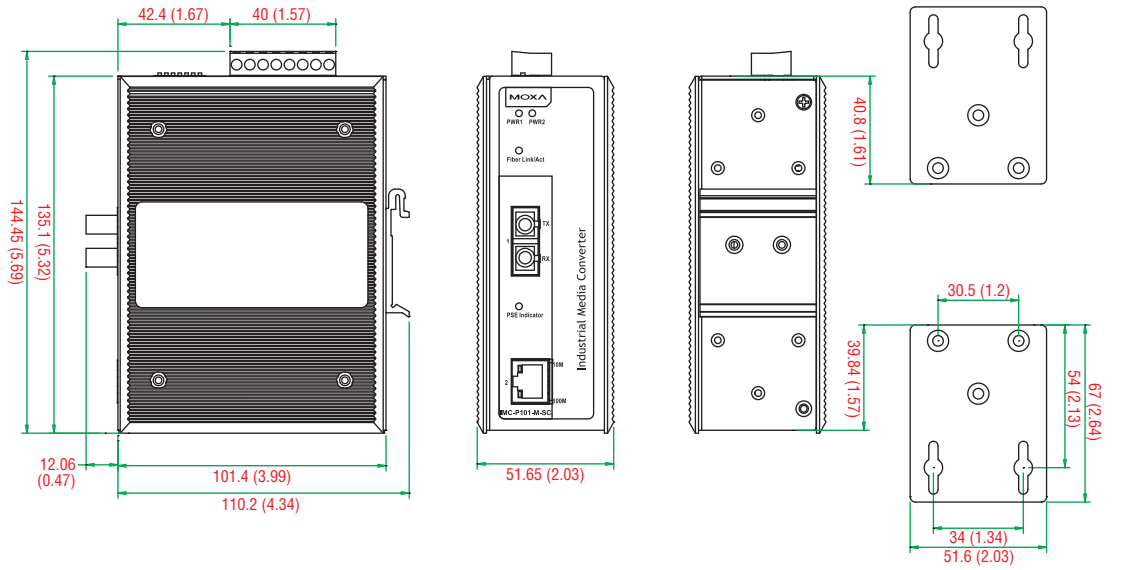
Time: 435,210 hrs
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | Panel-Mounting Kit (Optional)

Ordering Information

Available Models

IMC-P101-M-SC: PoE industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode port with SC connector, 0 to 60°C operating temperature
IMC-P101-M-ST: PoE industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode port with ST connector, 0 to 60°C operating temperature
IMC-P101-S-SC: PoE industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode port with SC connector, 0 to 60°C operating temperature
IMC-P101-S-ST: PoE industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode port with ST connector, 0 to 60°C operating temperature
IMC-P101-M-SC-T: PoE industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode port with SC connector, -40 to 75°C operating temperature
IMC-P101-M-ST-T: PoE industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode port with ST connector, -40 to 75°C operating temperature
IMC-P101-S-SC-T: PoE industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode port with SC connector, -40 to 75°C operating temperature
IMC-P101-S-ST-T: PoE industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode port with ST connector, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

WK-51: Wall-mounting kit

Package Checklist

- 1 IMC-P101 media converter
- Hardware installation guide (printed)
- Warranty card

IMC-101G Series

Industrial gigabit Ethernet-to-fiber media converter

- 10/100/1000BaseT(X) and 1000BaseSFP slot supported
- Link Fault Pass-through (LFP)
- Power failure, port break alarm by relay output
- Redundant power input
- -40 to 75°C operating temperature range (T models)
- Designed for hazardous locations (Class 1 Div. 2/Zone 2, IECEx)
- More than 20 options available*

*See the SFP-1G Series datasheet for details.

Introduction

The IMC-101G industrial gigabit modular media converters are designed to provide reliable and stable 10/100/1000BaseT(X) to 1000BaseSX/LX/LHX/ZX media conversion in harsh industrial environments. The IMC-101G's industrial design is excellent for keeping your industrial automation applications running continuously, and each IMC-101G converter comes with a relay output warning alarm to help prevent damage and loss. All IMC-101G models are subjected to a 100% burn-in test, and are available in models that support a standard operating temperature range of 0 to 60°C, and an extended operating temperature range of -40 to 75°C.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LSX/LX/LH/LHX/ZX/E2X

Interface

RJ45 Ports: 10/100/1000BaseT(X)
Fiber Ports: 1000BaseSFP slot
LED Indicators: PWR1, PWR2, FAULT, 10/100M (TP port), 1000M (TP and Fiber port)
DIP Switches: Port break alarm mask, Link Fault Pass-through, SFP Auto/Force
Alarm Contact: One relay output with current carrying capacity of 1 A @ 24 VDC

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 53.6 x 135 x 105 mm (2.11 x 5.32 x 4.13 in)
Weight: 630 g (1.39 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 45 VDC redundant inputs
Input Current: 220 mA @ 45 VDC max.
Connection: Removable terminal block
Overload Current Protection: 2.5 A
Reverse Polarity Protection: Present

Standards and Certifications

Safety: UL 508
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nC nL IIC T4, IECEx
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
EN 61000-4-2 (ESD): Contact: 6 kV; Air: 8 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 3 V/m
EN 61000-4-4 (EFT): Power: 2 kV; Signal: 2 kV
EN 61000-4-5 (Surge): Power: 1 kV; Signal: 1 kV
EN 61000-4-6 (CS): 150 kHz to 80 MHz: 3 V/m
EN 61000-4-8 (PFMF)
EN 61000-4-11
Green Product: RoHS, CRoHS, WEEE
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

MTBF (mean time between failures)

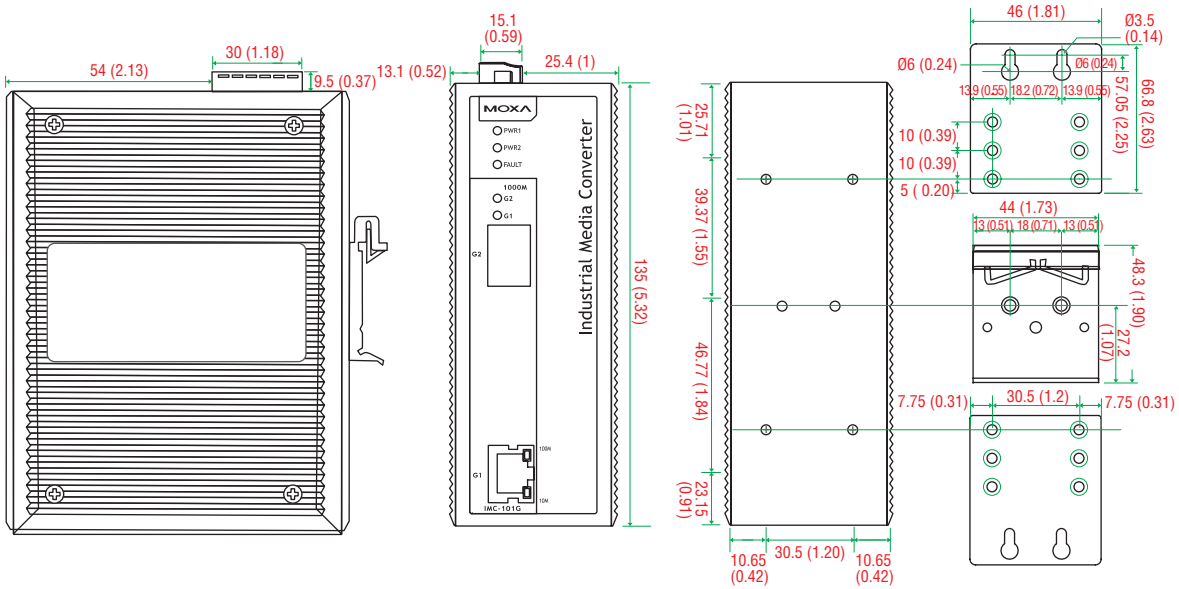
Time: 500,540 hrs
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | Panel-Mounting Kit

Ordering Information

Available Models

IMC-101G: Industrial 10/100/1000BaseT(X) to 1000BaseSFP media converter, 0 to 60°C operating temperature

IMC-101G-T: Industrial 10/100/1000BaseT(X) to 1000BaseSFP media converter, -40 to 75°C operating temperature

Note: You must purchase at least one SFP-1G module to use these products. See the SFP-1G Series datasheet for details.

Package Checklist

- 1 IMC-101G media converter
- Quick installation guide (printed)
- Warranty card

IECEx Models

IMC-101G-IEX: Industrial 10/100/1000BaseT(X) to 1000BaseSFP media converter, IECEx, 0 to 60°C operating temperature

IMC-101G-T-IEX: Industrial 10/100/1000BaseT(X) to 1000BaseSFP media converter, IECEx, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DR-4524: 45W/2A DIN-rail 24 VDC power supply, 85 to 264 VAC input

DR-75-24: 75W/3.2A DIN-rail 24 VDC power supply, 85 to 264 VAC input

DR-120-24: 120W/5A DIN-rail 24 VDC power supply, 88 to 132 VAC or 176 to 264 VAC input by switch

WK-46: DIN-rail/wall-mounting kit, 2 plates with 4 screws

RK-4U: 4U-high 19-inch rack-mounting kit

IMC-101 Series

Industrial Ethernet-to-fiber media converters

- 10/100BaseT(X) auto-negotiation and auto-MDI/MDI-X
- Link Fault Pass-Through (LFP)
- Power failure, port break alarm by relay output
- Redundant power inputs
- -40 to 75°C operating temperature range (T models)
- Designed for hazardous locations (Class 1 Div. 2/Zone 2, IECEx)

Introduction

The IMC-101 industrial media converters provide industrial-grade media conversion between 10/100BaseT(X) and 100BaseFX (SC/ST connectors). The IMC-101 converters' reliable industrial design is excellent for keeping your industrial automation applications running continuously, and each IMC-101 converter comes with a relay output warning alarm to help prevent damage and loss. The IMC-101 media converters are designed for harsh industrial environments, such as in hazardous locations (Class 1, Division 2/Zone 2, IECEx, DNV, and GL Certification), and comply with FCC, UL, and CE standards. The IMC-101 series is available in models that support an operating temperature from 0 to 60°C, and an extended operating temperature from -40 to 75°C. All IMC-101 series converters are subjected to a 100% burn-in test.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX

Interface

RJ45 Ports: 10/100BaseT(X)
Fiber Ports: 100BaseFX (SC/ST connectors)
LED Indicators: PWR1, PWR2, FAULT, 10/100M (TP port), 100M (Fiber port), FDX/COL (Fiber port)
DIP Switches: 100BaseFX Full/Half duplex selection, port break alarm mask
Alarm Contact: One relay output with current carrying capacity of 1 A @ 24 VDC

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)
Weight: 630 g (1.39 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 45 VDC redundant inputs
Input Current: 320 mA @ 45 VDC max.
Connection: Removable terminal block
Overload Current Protection: 1.1 A
Reverse Polarity Protection: Present

Standards and Certifications

Safety: UL 508
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone2 Ex nA nC op is IIC T4 Gc, IECEx Ex nA nC IIC T4 Gc
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
EN 61000-4-2 (ESD): Contact: 6 kV; Air: 8 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 3 V/m
EN 61000-4-4 (EFT): Power: 2 kV; Signal: 2 kV
EN 61000-4-5 (Surge): Power 1 kV; Signal 1 kV
EN 61000-4-6 (CS): 150 kHz to 80 MHz: 3 V/m
EN 61000-4-8 (PFMF)
EN 61000-4-11
Green Product: RoHS, CRoHS, WEEE
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Marine: DNV, GL

MTBF (mean time between failures)

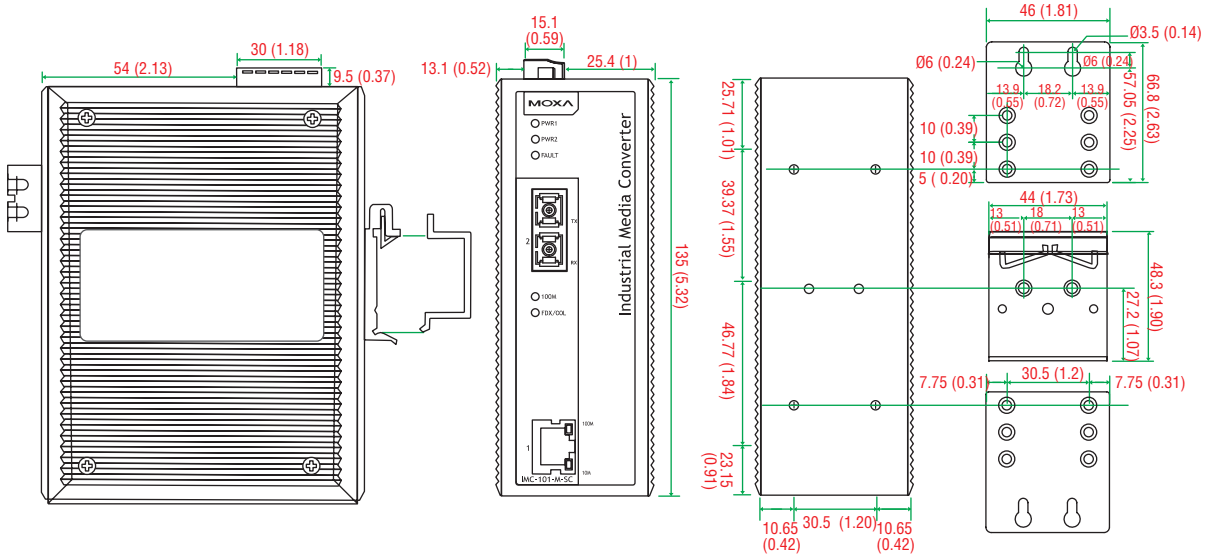
Time: 401,000 hrs
Standard: MIL-HDBK-217F

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | Panel-Mounting Kit

Ordering Information

Available Models

IMC-101-M-SC: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode, SC connector, 0 to 60°C operating temperature
IMC-101-M-ST: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode, ST connector, 0 to 60°C operating temperature
IMC-101-S-SC: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode, SC connector, 40 km, 0 to 60°C operating temperature
IMC-101-S-SC-80: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode, SC connector, 80 km, 0 to 60°C operating temperature
IMC-101-M-SC-T: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode, SC connector, -40 to 75°C operating temperature
IMC-101-M-ST-T: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode, ST connector, -40 to 75°C operating temperature
IMC-101-S-SC-T: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode, SC connector, 40 km, -40 to 75°C operating temperature
IMC-101-S-SC-80-T: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode, SC connector, 80 km, -40 to 75°C operating temperature

Package Checklist

- 1 IMC-101 media converter
- Quick installation guide (printed)
- Warranty card

IECEx Models

IMC-101-M-SC-IEX: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode, SC connector, IECEx, 0 to 60°C operating temperature
IMC-101-M-ST-IEX: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode, ST connector, IECEx, 0 to 60°C operating temperature
IMC-101-S-SC-IEX: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode, SC connector, 40 km, IECEx, 0 to 60°C operating temperature
IMC-101-S-SC-80-IEX: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode, SC connector, 80 km, IECEx, 0 to 60°C operating temperature
IMC-101-M-SC-T-IEX: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode, SC connector, IECEx, -40 to 75°C operating temperature
IMC-101-M-ST-T-IEX: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode, ST connector, IECEx, -40 to 75°C operating temperature
IMC-101-S-SC-T-IEX: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode, SC connector, 40 km, IECEx, -40 to 75°C operating temperature
IMC-101-S-SC-80-T-IEX: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode, SC connector, 80 km, IECEx, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DR-4524: 45W/2A DIN-rail 24 VDC power supply, 85 to 264 VAC input
DR-75-24: 75W/3.2A DIN-rail 24 VDC power supply, 85 to 264 VAC input
DR-120-24: 120W/5A DIN-rail 24 VDC power supply, 88 to 132 VAC/176 to 264 VAC input by switch
WK-46: Wall-mounting kit
WK-51-01: DIN-rail/wall-mounting kit, 2 plates with 6 screws
RK-4U: 4U-high 19-inch rack-mounting kit
DK-DC50131-01: DIN-rail mounting kit, 2 plates with 8 screws

IMC-21A Series

Industrial 10/100BaseT(X) to 100BaseFX media converters

- Multi-mode or single-mode, with SC or ST fiber connector
- Link Fault Pass-Through (LFP)
- -40 to 75°C operating temperature range (T models)
- DIP switches to select FDX/HDX/10/100/Auto/Force

Introduction

The IMC-21A industrial media converters are entry-level 10/100BaseT(X) to 100BaseFX media converters designed to provide reliable and stable operation in harsh industrial environments. The converters can operate reliably in temperatures ranging from -40 to 75°C. The rugged hardware design ensures that your Ethernet equipment can withstand demanding industrial conditions. The IMC-21A converters are easy to mount on a DIN rail or in distribution boxes.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3x for Flow Control

Interface

RJ45 Ports: 10/100BaseT(X)
Fiber Ports: 100BaseFX (SC/ST connectors)
LED Indicators: Power, 10/100M (TP port), 100M (fiber port), FDX/COL (fiber port)
DIP Switches: TP port's 10/100M, Half/Full modes, Force/Auto modes; fiber port's Half/Full modes, Link Fault Pass-Through (LFP)

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 30 x 125 x 79 mm (1.19 x 4.92 x 3.11 in)
Weight: 170 g (0.37 lb)
Installation: DIN-rail mounting

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current: 265 mA @ 48 VDC max.
Connection: Removable 3-contact terminal block
Overload Current Protection: 1.1 A
Reverse Polarity Protection: Present

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
EN 61000-4-2 (ESD): Contact: 6 kV; Air: 8 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 1 V/m
EN 61000-4-4 (EFT): Power: 1 kV; Signal: 1 kV
EN 61000-4-5 (Surge): Power: 1 kV; Signal: 1 kV
EN 61000-4-6 (CS): 150 kHz to 80 MHz: 3 V/m
EN 61000-4-8 (PFMF)
EN 61000-4-11
Green Product: RoHS, CRoHS, WEEE
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

MTBF (mean time between failures)

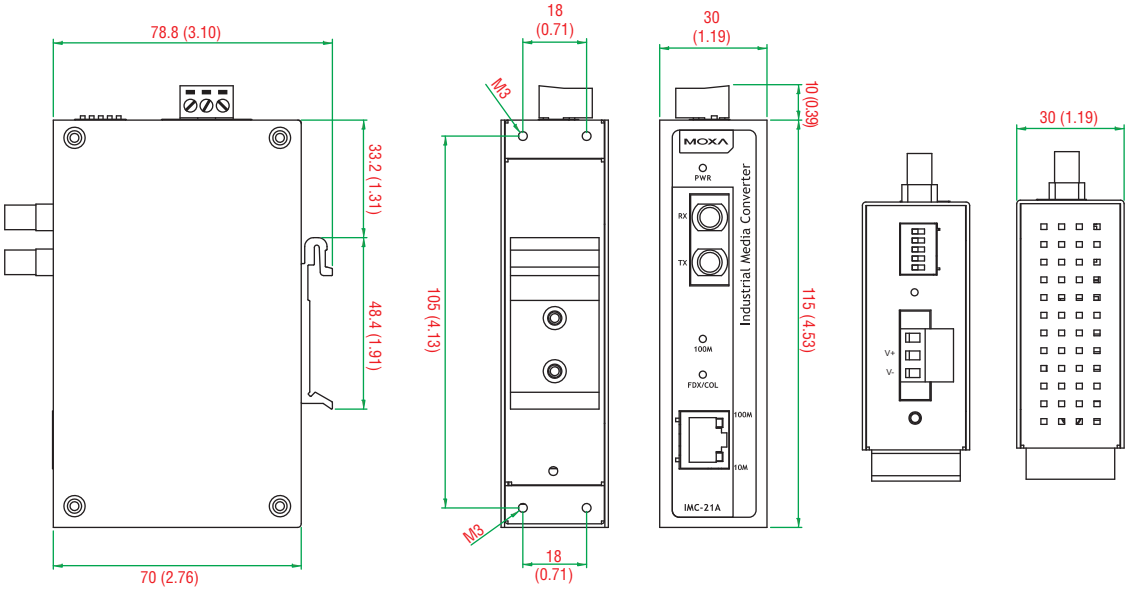
Time: 353,000 hrs
Standard: MIL-HDBK-217F

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | Top View | Bottom View

Ordering Information

Available Models

IMC-21A-M-SC: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode, SC connector, -10 to 60°C operating temperature
IMC-21A-M-ST: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode, ST connector, -10 to 60°C operating temperature
IMC-21A-S-SC: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode, SC connector, -10 to 60°C operating temperature
IMC-21A-M-SC-T: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode, SC connector, -40 to 75°C operating temperature
IMC-21A-M-ST-T: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode, ST connector, -40 to 75°C operating temperature
IMC-21A-S-SC-T: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode, SC connector, -40 to 75°C operating temperature

Package Checklist

- 1 IMC-21A media converter
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

SC to ST Connectors: See Appendix A

IMC-21 Series

Entry-level industrial 10/100BaseT(X) to 100BaseFX media converters

- Multi-mode or single-mode, with SC or ST fiber connector
- Link Fault Pass-Through (LFP)
- DIP switches to select FDX/HDX/10/100/Auto/Force

Introduction

The IMC-21 industrial media converters are entry-level 10/100BaseT(X) to 100BaseFX media converters designed to provide reliable and stable operation in harsh industrial environments. The converters are a cost-effective solution that run on either a 12 to 48 VDC power input and can operate reliably in temperatures ranging from -10 to 60°C. The rugged hardware design ensures that your Ethernet equipment can withstand demanding industrial conditions. The IMC-21 converters are easy to mount on a DIN rail or in distribution boxes.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3x for Flow Control

Interface

RJ45 Ports: 10/100BaseT(X)
Fiber Ports: 100BaseFX (SC/ST connectors)
LED Indicators: Power, 10/100M (TP port), 100M (fiber port), FDX/COL (fiber port)
DIP Switches: TP port's 10/100M, Half/Full modes, and Force/Auto modes, fiber connection's Full/Half mode, Link Fault Pass-Through (LFP)

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Physical Characteristics

Housing: Plastic, IP30 protection
Dimensions: 25 x 109 x 97 mm (0.98 x 4.29 x 3.82 in)
Weight: 125 g (0.27 lb)
Installation: DIN-rail mounting

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -40 to 70°C (-40 to 158°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Rated Voltage: 300 mA @ 48 VDC max.
Connection: Removable 3-contact terminal block
Overload Current Protection: 1.1 A
Reverse Polarity Protection: Present

Standards and Certifications

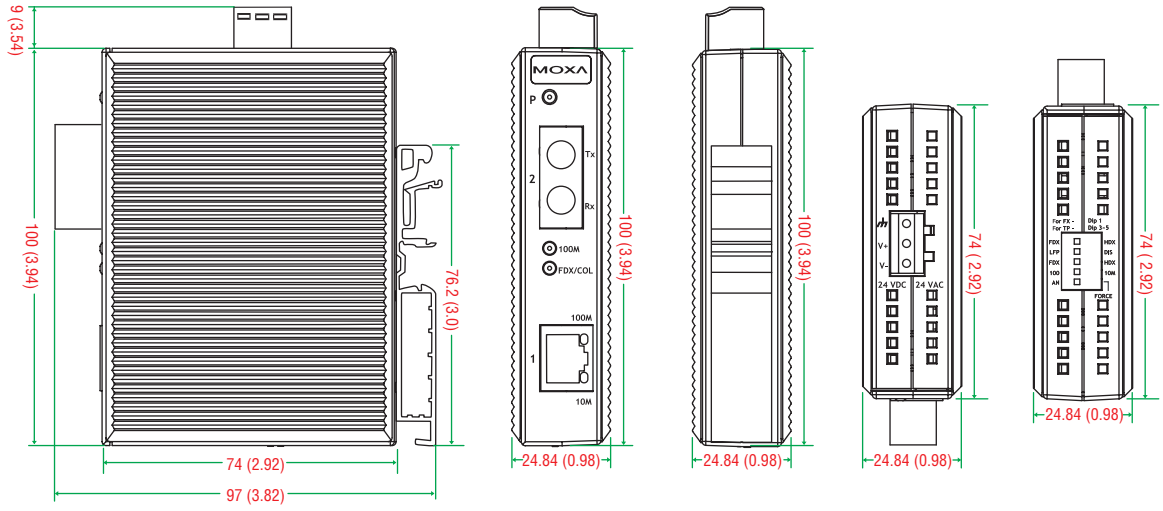
Safety: UL 508
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
EN 61000-4-2 (ESD): Contact: 6 kV; Air: 8 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 1 V/m
EN 61000-4-4 (EFT): Power: 1 kV; Signal: 1 kV
EN 61000-4-5 (Surge): Power: 1 kV; Signal: 1 kV
EN 61000-4-6 (CS): 150 kHz to 80 MHz: 3 V/m
EN 61000-4-8 (PFMF)
EN 61000-4-11
Green Product: RoHS, CRoHS, WEEE
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

MTBF (mean time between failures)
Time: 353,000 hrs
Standard: MIL-HDBK-217F

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | Top View | Bottom View

Ordering Information

Available Models

IMC-21-M-SC: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode, SC connector
IMC-21-M-ST: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode, ST connector
IMC-21-S-SC: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode, SC connector

Package Checklist

- 1 IMC-21 media converter
- Quick installation guide (printed)
- Warranty card

IMC-21GA Series

Industrial gigabit Ethernet-to-fiber media converters

- Supports 1000Base-SX/LX with SC connector, or SFP slot
- Link Fault Pass-through (LFP)
- 10K jumbo frame
- Redundant power input
- -40 to 75°C operating temperature range (T models)
- Supports Energy Efficient Ethernet (IEEE 802.3az)

Introduction

The IMC-21GA industrial Gigabit media converters are designed to provide reliable and stable 10/100/1000BaseT(X) to 100/1000Base-SX/LX or selected 100/1000Base SFP module media conversion. The IMC-21GA supports IEEE 802.3az (Energy Efficient Ethernet) and 10K jumbo frames, allowing them to save power and enhance transmission performance. The converters come with a relay output warning alarm to help prevent damage and loss, and all IMC-21GA models are subjected to a 100% burn-in test, and are available in models that support a standard operating temperature range of 0 to 60°C, and an extended operating temperature range of -40 to 75°C.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3az (Energy Efficient Ethernet)

Interface

RJ45 Ports: 10/100/1000BaseT(X)
Fiber Ports: 100/1000Base-SX/LX or 100/1000BaseSFP slot
LED Indicators: PWR1, PWR2, G1 (copper port 10M/100M/1000M), G2 (fiber port 100M/1000M)
DIP Switches: Fiber speed 100M/1000M, Link Fault Pass-through, Energy Efficient Ethernet

Optical Fiber

Multi-mode Transmission Distance (IMC-21GA-SX-SC):
1000BaseSX: 0 to 500 m, 850 nm (50/125 µm, 400 MHz*km)
Single-mode Transmission Distance (IMC-21GA-LX-SC):
1000BaseLX: 0 to 10 km, 1310 nm (9/125 µm, 3.5 PS/(nm*km))

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 30 x 125 x 79 mm (1.19 x 4.92 x 3.11 in)
Weight: 170 g (0.37 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC, redundant inputs
Input Current: 285 mA @ 48 VDC max.
Connection: Removable terminal block
Overload Current Protection: 1.5 A
Reverse Polarity Protection: Present

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
EN 61000-4-2 (ESD): Contact: 6 kV; Air: 8 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 1 V/m
EN 61000-4-4 (EFT): Power: 1 kV; Signal: 1 kV
EN 61000-4-5 (Surge): Power: 1 kV; Signal: 1 kV
EN 61000-4-6 (CS): 150 kHz to 80 MHz: 3 V/m
EN 61000-4-8 (PFMF)
EN 61000-4-11
Green Product: RoHS, CRoHS, WEEE
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

MTBF (mean time between failures)

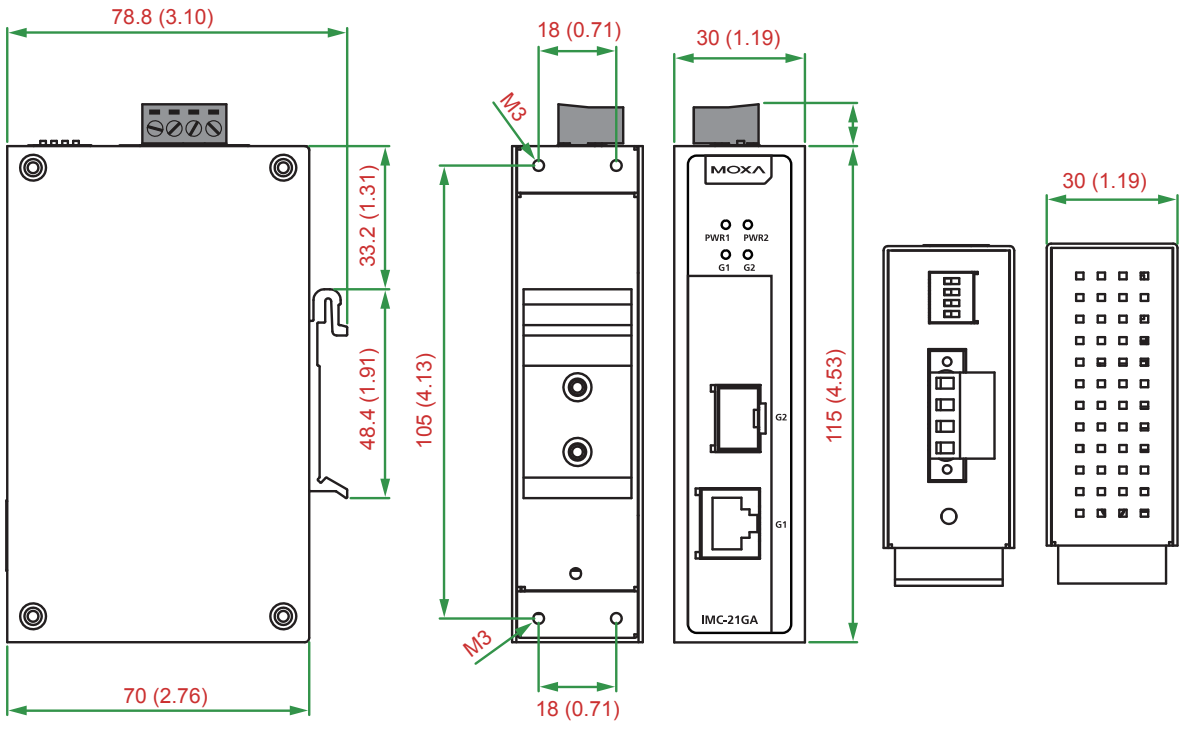
Time:
IMC-21GA: 2,762,058 hrs
IMC-21GA-LX-SC: 2,573,203 hrs
IMC-21GA-SX-SC: 2,573,203 hrs
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

IMC-21GA: Industrial 10/100/1000BaseT(X) to 100/1000BaseSFP media converter, -10 to 60°C operating temperature
IMC-21GA-T: Industrial 10/100/1000BaseT(X) to 100/1000BaseSFP media converter, -40 to 75°C operating temperature
IMC-21GA-SX-SC: Industrial 10/100/1000BaseT(X) to 100/1000BaseSC media converter, 0.5 km, -10 to 60°C operating temperature
IMC-21GA-SX-SC-T: Industrial 10/100/1000BaseT(X) to 100/1000BaseSC media converter, 0.5 km, -40 to 75°C operating temperature
IMC-21GA-LX-SC: Industrial 10/100/1000BaseT(X) to 100/1000BaseSC media converter, 10 km, -10 to 60°C operating temperature
IMC-21GA-LX-SC-T: Industrial 10/100/1000BaseT(X) to 100/1000BaseSC media converter, 10 km, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DR-4524: 45W/2A DIN-rail 24 VDC power supply, 85 to 264 VAC input
DR-75-24: 75W/3.2A DIN-rail 24 VDC power supply, 85 to 264 VAC input
DR-120-24: 120W/5A DIN-rail 24 VDC power supply, 88 to 132 VAC or 176 to 264 VAC input by switch
SFP-1FE Series: 1-port Fast Ethernet SFP modules
SFP-1G Series: 1-port Gigabit Ethernet SFP modules

Package Checklist

- 1 IMC-21GA media converter
- Quick installation guide (printed)
- Warranty card

SFP Module Version Compatibility Table

Mode	Data Rate	Distance	Part Number	Center Wavelength
SM	100M	40 km	SFP-1FESLC-T V1.3	1310 nm
		80 km	SFP-1FELLC-T V1.3	1550 nm
	1G	10 km	SFP-1G10ALC V1.1	1310/1550 nm
		10 km	SFP-1G10BLC V1.1	
		10 km	SFP-1GLXLC V1.1	1310 nm
		10 km	SFP-1GLXLC-T V1.1	1310 nm
		20 km	SFP-1G20ALC V1.1	1310/1550 nm
		20 km	SFP-1G20BLC V1.1	
		20 km	SFP-1GLHLC V1.1	1310 nm
		20 km	SFP-1GLHLC-T V1.1	1310 nm
		30 km	SFP-1GLHXLC V1.1	1310 nm
		30 km	SFP-1GLHXLC-T V1.1	1310 nm
		40 km	SFP-1G40ALC V1.1	1310/1550 nm
		40 km	SFP-1G40BLC V1.1	
		70 km	SFP-1GZXLC V1.1	1550 nm
		70 km	SFP-1GZXLC-T V1.1	1550 nm
		110 km	SFP-1GEZXLC V1.1	1550 nm
		120 km	SFP-1GEZXLC-120 V1.1	1550 nm
MM	100M	2 km	SFP-1FEMLC-T V1.3	1310 nm
	1G	550 m	SFP-1GSXLC V1.1	850 nm
		550 m	SFP-1GSXLC-T V1.1	850 nm
		2 km	SFP-1GLSXLC V1.1	1310 nm
		2 km	SFP-1GLSXLC-T V1.1	1310 nm

IEX-402 Series

Managed DSL Ethernet extenders

- Automatic CO/CPE negotiation reduces configuration time
- Up to 100 Mbps over twisted-pair copper wires (IEX-402-VDSL2)
- Turbo mode connection, up to 15.3 Mbps over twisted-pair copper wires (IEX-402-SHDSL)
- Link Fault Pass-through (LFP) support and interoperable with Turbo Ring and Turbo Chain
- Link quality indicators for simple troubleshooting
- Easy network management by web browser, Telnet/serial console, Windows utility, ABC-01, and MXview

Introduction

The IEX-402 series is an industrial managed Ethernet extender designed with one 10/100BaseT(X) and one DSL port. The Ethernet extender provides a point-to-point extension over twisted copper wires based on G.SHDSL.bis and VDSL2 standards. The IEX-402-SHDSL supports data rates of up to 15.3 Mbps with a long transmission distance of up to 8 km, while the IEX-402-VDSL2 provides data rates of up to 100 Mbps with transmission distance of up to 3 km.

The IEX-402 series is designed for use in harsh operating environments. The DIN-rail mount, wide operating temperature range (-40 to 75°C), and dual power input make it ideal for installation in industrial applications.

To simplify configuration, the IEX-402 series uses CO/CPE auto negotiation. By factory default, the device will automatically assign CPE status to one of each pair of IEX devices. In addition, Link Fault Pass-through (LFP) and network redundancy interoperability enhance the reliability and accessibility of communication networks. Advanced managed and monitored functionality through MXview, including a virtual panel, improve the user experience for quick troubleshooting.

Features and Benefits

- Automatic CO/CPE negotiation reduces configuration time
- IEX-402-SHDSL series: Standard G.SHDSL data rate up to 5.7 Mbps (Turbo Speed connections up to 15.3 Mbps), with up to 8 km transmission distance (performance varies by cable quality)
- IEX-402-VDSL2 series: Standard VDSL2 data rate up to 100 Mbps, with up to 3 km transmission distance (performance varies with line conditions)
- Supports Link Fault Pass-Through (LFP) and Line-swap fast recovery
- Supports SNMP v1/v2c/v3 for different levels of network management
- Interoperable with Turbo Ring/Turbo Chain network redundancy
- Compatible with EtherNet/IP and PROFINET protocols for transparent transmission
- Easy network management through web browser, Telnet/Serial console, Windows utility, MXview, and ABC-01
- IPv6 Ready

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control
IEEE 802.1p for Class of Service
ITU-T G.991.2 for Single-pair high-speed digital subscriber line transceivers (IEX-402-SHDSL only)
ITU G.993.2 for very high speed digital subscriber line transceivers 2 (IEX-402-VDSL2 only)

Software Features

Management: SNMPv1/v2c/v3, DHCP Client, TFTP, SNTP, HTTP, Telnet, Syslog, LLDP
MIB: MIB-II
Flow Control: IEEE 802.3x flow control, back pressure flow control

Interface

DSL Port: DSL Port: RJ11 (RJ45 connector) or detachable 2-contact terminal block
RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Console Port: RS-232 (RJ45 connector)
LED Indicators: PWR1, PWR2, FAULT, STATE, LINK/ACT, CO/CPE, 10/100 (TP port)
DIP Switches:
IEX-402-SHDSL series: CO/CPE, SNR/SPEED, ANNEX B/ANNEX A, STD/TURBO
IEX-402-VDSL2 series: CO/CPE, SNR/SPEED, STD/INP
Button: Reset button

Switch Properties

MAC Table Size: 1K
Packet Buffer Size: 512K

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions:
35 x 130 x 105 mm (1.38 x 5.12 x 4.13 in)
Weight:
IEX-402-SHDSL Series: 290 g (0.64 lb)
IEX-402-VDSL2 Series: 275 g (0.61 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Altitude: Up to 2000 m
Note: Contact Moxa for products guaranteed to function at higher altitudes.

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12/24/48 VDC, redundant dual inputs
Operating Voltage: 9.6 to 60 VDC
Input Current:
IEX-402-SHDSL Series: 0.36 A @ 24 VDC
IEX-402-VDSL Series: 0.33 A @ 24 VDC
Connection: 2 removable 2-contact terminal block
Overload Current Protection: Present
Reverse Polarity Protection: Present

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
EN 61000-4-2 (ESD): Contact: 6 kV; Air: 8 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 10 V/m
EN 61000-4-4 (EFT): Power: 2 kV; Signal: 2 kV
EN 61000-4-5 (Surge): Power: 0.5 kV; Signal: 1 kV
EN 61000-4-6 (CS): 10 V
EN 61000-4-8
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Traffic Control: NEMA TS2 (IEX-402-VDSL2 only)
Rail Traffic: EN 50121-4
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

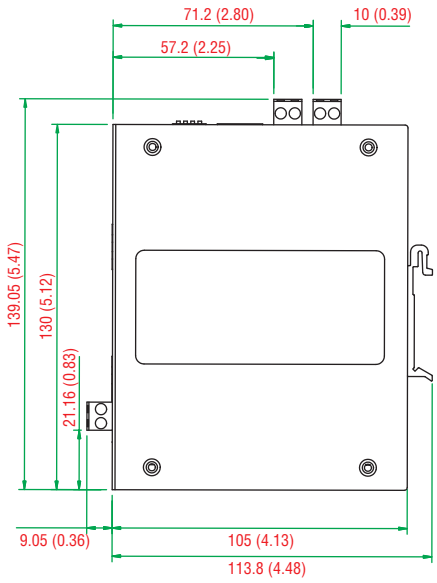
Time:
IEX-402-SHDSL series: 1,310,000 hrs
IEX-402-VDSL2 series: 1,490,000 hrs
Standard: Telcordia (Bellcore), GB

Warranty

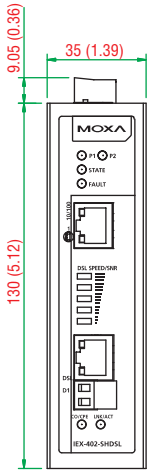
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

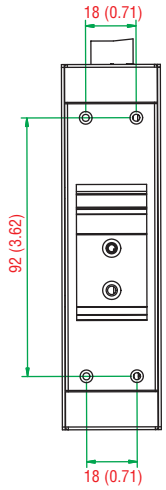
Unit: mm (inch)



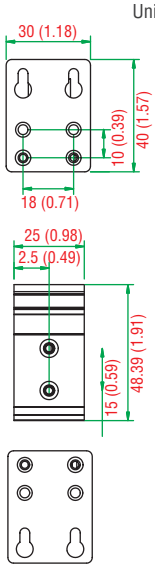
Side View



Front View



Rear View



DIN-Rail/Panel-Mounting Kit

Ordering Information

Available Models		Port Interface	
Standard Temperature (-10 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	DSL
IEX-402-SHDSL	IEX-402-SHDSL-T	1	1
IEX-402-VDSL2	IEX-402-VDSL2-T	1	1

Optional Accessories (can be purchased separately)

RK-4U: 4U-high 19-inch rack-mounting kit
MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
DR-4524/75-24/120-24: 45/75/120 W DIN-rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-30: Wall-mounting kit, 2 plates with 4 screws

Package Checklist

- IEX-402 DSL Ethernet Extender
- Serial Cable: CN20070
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

IEX-408E-2VDSL2 Series

Preliminary

Industrial managed 6 FE + 2 VDSL2 Ethernet extender

- VDSL2 high-speed long distance copper connections; up to 300 m at 100 Mbps and up to 3 km at 1 Mbps over twisted-pair copper wires
- Automatic CO/CPE negotiation reduces configuration time
- Turbo Ring / Turbo Chain on both Fast Ethernet and VDSL2 ports for fast recovery
- Controllable bypass mode on VDSL2 ports gives higher availability in a daisy chain topology
- Flexible deployment with 2-pin or RJ11/45 connector on VDSL2 ports
- Easy network management by web browser, Telnet/serial console, Windows utility, ABC-02, and MXview

NEMA TS2 | c UL us LISTED | EN 50121 | CE | FC

Introduction

The IEX-408E-2VDSL2 is an industrial managed Ethernet extender switch for establishing long distance Ethernet transmissions over twisted-pair copper wiring. IEX-408E-2VDSL2 units can easily be linked in series to form a long distance multi-drop configuration, with one IEX-408E-2VDSL2 unit located at each drop-point. Adjacent drop points can be separated theoretically by up to 3 km, with a transmission speed of 1 Mbps achieved using a VDSL2 connection (with a connection distance of 300 m, a transmission speed of 100 Mbps can be theoretically achieved). Each IEX-408E-2VDSL2 unit provides six 10/100BaseT(X) and two DSL ports, giving users an incredible amount of flexibility for linking together a wide variety of devices separated by vast distances.

Ethernet redundancy is provided by Turbo Ring, Turbo Chain, RSTP/STP, and MSTP, and a state-of-the-art controllable bypass solution on the DSL ports increases the system reliability and availability of your network. The IEX-408E-2VDSL2 series also supports advanced management and security features. It is the perfect solution for reducing the cost of establishing new network cable installations using existing twisted-pair copper wiring to extend copper cable networks beyond the conventional distance limitations imposed by the Ethernet protocol.

With its compact DIN-rail design, the IEX-408E-2VDSL2 series is perfect for use in harsh operating environments with limited installation space, such as ITS, rail wayside, oil and gas, mining, factory automation, and process automation applications. The DIN-rail mount, wide operating temperature range (-40 to 75°C), and dual power inputs make it ideal for installation in industrial applications.

To simplify configuration, the IEX-408E-2VDSL2 uses CO/CPE automatic negotiation (the factory default setting). The device will automatically assign CPE status to one of each pair of IEX devices. In addition, advanced management and monitoring functionalities through NMS, including a virtual panel, improve the user experience by enabling quick troubleshooting.

Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions
- Automatic CO/CPE negotiation reduces configuration time
- Standard VDSL2 data rate up to 100 Mbps, with up to 3 km transmission distance (performance varies with line conditions)
- Turbo Ring and Turbo Chain, RSTP/STP, and MSTP supported on both Ethernet and DSL ports for network redundancy
- Controllable bypass mode supported in between DSL ports for higher availability in long distance daisy chain topologies
- Port Trunking on Ethernet and DSL ports for optimum bandwidth utilization
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase efficiency
- Supports EtherNet/IP, PROFINET, and Modbus/TCP protocols for device management and monitoring
- DHCP Option 82 for IP address assignment with different policies
- RADIUS, TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Lock port function for blocking unauthorized access based on MAC address
- Supports SNMP v1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Port mirroring for online debugging
- Automatic warning by exception through e-mail and relay output
- ABC-02-USB (Automatic Backup Configurator) for system configuration backup/restore and firmware upgrade
- Easy network management through web browser, Telnet/Serial console, Windows utility, MXview, and ABC-02-USB

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP
ITU G.993.2 for very high speed digital subscriber line transceivers 2
Management: SNMP v1/v2c/v3, LLDP, Syslog, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP. TFTP, SMTP, RARP, Telnet, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2/v3, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ringv1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH
Time Management: SNTP, NTP Server/Client
Industrial Protocols: EtherNet/IP, PROFINET IO, Modbus/TCP
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Interface

DSL Port: RJ11 (RJ45 connector) or detachable 2-contact terminal block
RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Console Port: USB-serial console (Type B connector)
LED Indicators: PWR1, PWR2, FAULT, STATE, LINK/ACT, CO/CPE, 10/100 (Fast Ethernet port), MSTR/HEAD, CPLR/TAIL, DSL BYPASS
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC
Storage Port: USB storage port (Type A connector)
Button: Reset button
Digital Inputs: 1 input with the same ground, but electrically isolated from the electronics.
• +13 to +30 V for state “1”
• -30 to +3 V for state “0”
• Max. input current: 8 mA

Switch Properties

MAC Table Size: 16K
Packet Buffer Size: 1.5 MB for Fast Ethernet side; 8 KB for DSL side
Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 70 x 111 x 135 mm (2.76 x 4.37 x 5.39 in)
Installation: DIN-rail mounting, wall mounting (with optional kit)
Altitude: Up to 2000 m
Note: Contact Moxa for products guaranteed to function at higher altitudes.

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage:
LV Models: 12/24/48 VDC, redundant dual inputs
HV Models: 110/220 VDC/VAC
Operating Voltage:
LV Models: 9.6 to 60 VDC
HV Models: 88 to 300 VDC, 85 to 264 VAC
Connection: 5-pin terminal block
Overload Current Protection: Present
Reverse Polarity Protection: Present

Standards and Certifications

Safety: UL 61010-2-201, EN 60950-1 (LVD) (In plan)
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
EN 61000-4-2 (ESD): Contact: 8 kV; Air: 15 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 10 V/m
EN 61000-4-4 (EFT): Power: 4 kV
EN 61000-4-5 (Surge): Power: 4 kV; Signal: 4 kV
EN 61000-4-6 (CS): 10 V
EN 61000-4-8
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Traffic Control: NEMA TS2 (In plan)
Rail Traffic: EN 50121-4 (In plan)
Vibration: IEC 60068-2-6
Note: Please check Moxa’s website for the most up-to-date certification status.

MTBF (mean time between failures)

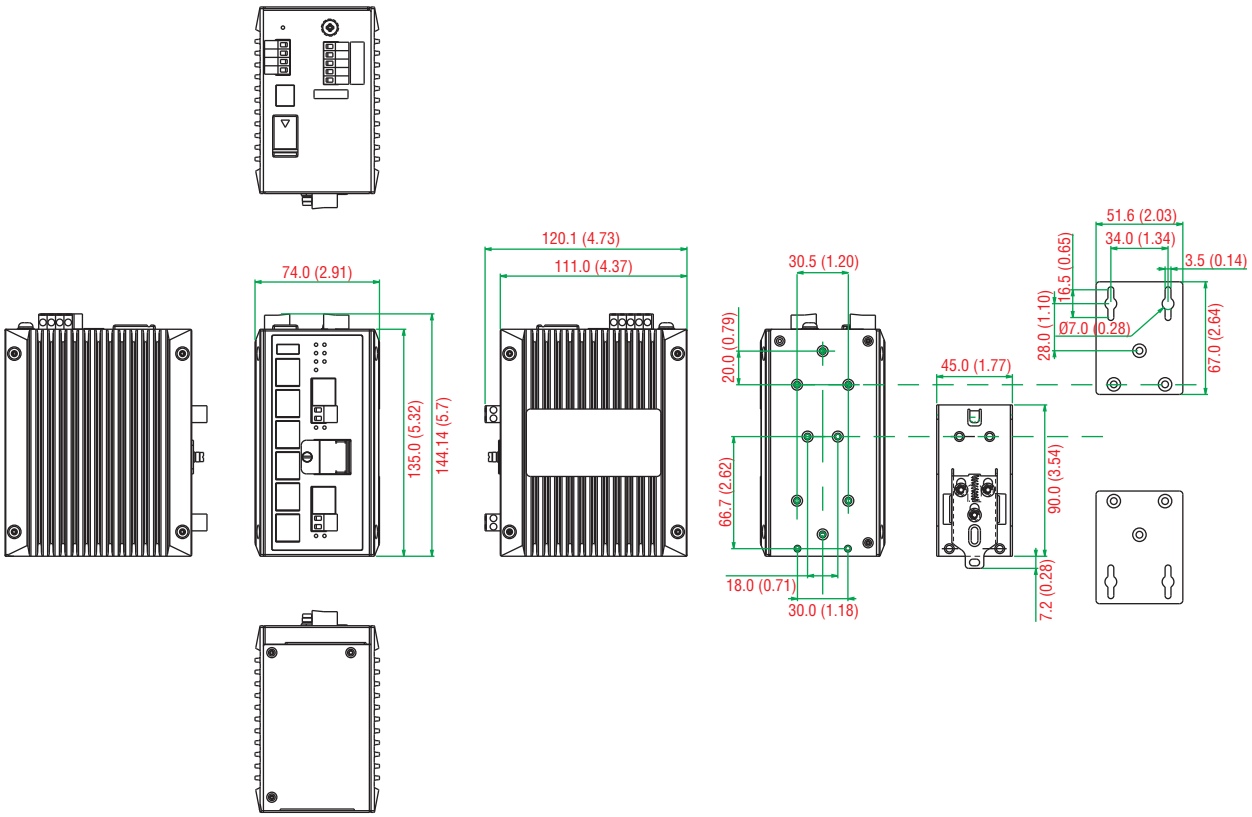
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models	Operating Temperature		Power Supply		Port Interface		Bypass (DSL ports)
	Standard Temperature (-10 to 60°C)	Wide Temperature (-40 to 75°C)	LV: 12/24/48 VDC (9.6 to 60 VDC), isolated (dual power inputs)	HV: 110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC), isolated	DSL	10/100BaseT(X)	
IEX-408E-2VDSL2-LV	✓	–	1	–	2	6	1
IEX-408E-2VDSL2-LV-T	–	✓	1	–	2	6	1
IEX-408E-2VDSL2-HV	✓	–	–	1	2	6	1
IEX-408E-2VDSL2-HV-T	–	✓	–	1	2	6	1

Optional Accessories (can be purchased separately)

WK-51-01: Wall-mounting kit, 2 plates with 6 screws
RK-4U: 4U-high 19-inch rack-mounting kit
MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-02-USB-T: Configuration backup and restoration tool for managed Ethernet switches, -40 to 75°C operating temperature
DR-4524/75-24/120-24: 45/75/120 W DIN-rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-rail 24 VDC power supplies, -20 to 70°C operating temperature
DR-75-48/120-48: 75/120 W DIN-rail 48 VDC power supplies
DRP-240-48: 240 W DIN-rail 48 VDC power supplies
SDR-480P-48: 480 W DIN-rail 48 VDC power supplies

Package Checklist

- IEX-408E-2VDSL2 Extender Switch
- USB Cable: CBL-USBA/B-100
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

Industrial Ethernet Gateways

Product Selection Guide

Industrial Ethernet Gateways (Modbus) 4-2
Industrial Ethernet Gateways 4-3
Industrial Ethernet Gateways (Wireless) 4-4

Industrial Ethernet Gateways

Introduction to Industrial Ethernet Gateways 4-5
MGate™ MB3180/3280/3480: 1, 2, and 4-port standard serial-to-Ethernet Modbus gateways 4-8
MGate™ MB3170/3270: 1 and 2-port advanced serial-to-Ethernet Modbus gateways 4-10
MGate™ MB3660 Series: 8 and 16-port redundant Modbus gateways 4-13
MGate™ 4101-MB-PBS Series: 1-port Modbus RTU/ASCII-to-PROFIBUS slave gateways 4-16
MGate™ 5101-PBM-MN Series: 1-port PROFIBUS-to-Modbus TCP gateways 4-18
MGate™ 5102-PBM-PN Series: 1-port PROFIBUS-to-PROFINET gateways 4-20
MGate™ 5105-MB-EIP Series: 1-port Modbus RTU/ASCII/TCP-to-EtherNet/IP gateways 4-22
MGate™ EIP3000 Series: 1 and 2-port EtherNet/IP-to-DF1 gateways 4-24
MGate™ W5108/W5208 Series: 1 and 2-port IEEE 802.11a/b/g/n wireless Modbus/DNP3 gateways 4-27

4

Industrial Ethernet Gateways

Industrial Ethernet Gateways (Modbus)

	MGate MB3180	MGate MB3280	MGate MB3480	MGate MB3170 MGate MB3170-T MGate MB3170I MGate MB3170I-T	MGate MB3170-M-SC (-T) MGate MB3170-M-ST (-T) MGate MB3170-S-SC (-T) MGate MB3170I-M-SC (-T) MGate MB3170I-S-SC (-T)	MGate MB3270 MGate MB3270-T MGate MB3270I MGate MB3270I-T	MGate MB3660-8-2AC MGate MB3660-8-2DC MGate MB3660I-8-2AC MGate MB3660-16-2AC MGate MB3660-16-2DC
Ethernet Interface							
Protocols	Modbus TCP						
Number of Ports	1			2 (1 IP, Cascade)	–	2 (1 IP, Cascade)	2 (2 IPs)
Number of Fiber Ports	–				1	–	
Speed	10/100 Mbps, Auto MDI/MDIX				100 Mbps	10/100 Mbps, Auto MDI/MDIX	
Connector	RJ45				SC, ST	RJ45	
Magnetic Isolation Protection	1.5 kV (built-in)						
Serial Interface							
Protocols	Modbus RTU/ASCII						
Number of Ports	1	2	4	1		2	8, 16
Serial Standards	RS-232/422/485						
Connectors	DB9-M			RS-232: DB9-M, RS-422/485: Terminal block		DB9-M	
ESD Protection	15 kV						
RS-485 Data Direction Control	ADDC®						
Serial Communication Parameters	Data Bits: 7, 8 Stop Bits: 1, 2						
Parity	None, Even, Odd, Space, Mark						
Flow Control	RTS/CTS, DTR/DSR, RTS Toggle (RS-232 only)						
Baudrate	50 bps to 921.6 kbps						
Isolation	–	–	–	2 kV (built-in, -I model only)			
Software							
Utility	MGate Manager for Windows 2000, Windows XP, Server 2003, Vista, Server 2008 (x86/x64), Windows Server 2008 R2, Windows 7/8/8.1 (x86/x64), Windows Server 2012 (x64), Windows 2012 R2						Device Search Utility (DSU) for Windows O.S.
Smart Routing	✓	✓	✓	✓	✓	✓	✓
Serial Redirection	–	–	–	–	–	✓	✓
ProCOM	–	–	–	✓	✓	✓	–
Priority Control	–	–	–	✓	✓	✓	✓
MXview/MXconfig	✓	✓	✓	✓	✓	✓	✓
SNMP	v1 (read only)						
Physical Characteristics							
Housing	Metal (IP30)			Plastic (IP30)			Metal (IP30)
Dimensions	22 x 52 x 80 mm (0.87 x 2.05 x 3.15 in)	22 x 77 x 111 mm (0.87 x 3.03 x 4.37 in)	35.5 x 102.7 x 157.2 mm (1.40 x 4.04 x 6.19 in)	29 x 89.2 x 118.5 mm (1.14 x 3.51 x 4.67 in)			440 x 45 x 198 mm (17.32 x 1.77 x 7.80 in)
Weight	340 g (0.75 lb)	360 g (0.79 lb)	740 g (1.63 lb)	360 g (0.79 lb)	360 g (0.79 lb)	380 g (0.84 lb)	2,830 g (6.24 lb), max.
Environmental Limits							
Operating Temperature	0 to 60°C (32 to 140°F)			Standard Models: 0 to 60°C (32 to 140°F) Wide Temp. Models: -40 to 75°C (-40 to 167°F)			0 to 60°C (32 to 140°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)			-40 to 85°C (-40 to 185°F)			
Ambient Relative Humidity	5 to 95% RH (non-condensing)						
Shock	–			IEC 60068-2-27			
Drop	–			IEC 60068-2-32			
Vibration	–			IEC 60068-2-6, IEC 60068-2-64			
Power Requirements							
Input Voltage	12 to 48 VDC						For DC models: Dual 20 to 60 VDC For AC models: Dual 100 to 240 VAC, 47 to 63 Hz
Input Current	200 mA @ 12 VDC	250 mA @ 12 VDC	385 mA @ 12 VDC	MGate MB3170: 435 mA @ 12 VDC MGate MB3170I: 555 mA @ 12 VDC	MGate MB3170-M-SC: 510 mA @ 12 VDC MGate MB3170-M-ST: 435 mA @ 12 VDC MGate MB3170-S-SC: 555 mA @ 12 VDC MGate MB3170I-M-SC: 555 mA @ 12 VDC MGate MB3170I-S-SC: 555 mA @ 12 VDC	MGate MB3270: 435 mA @ 12 VDC MGate MB3270I: 510 mA @ 12 VDC	MGate MB3660-8-2AC: 144 mA @ 110 VAC MGate MB3660-8-2DC: 312 mA @ 24 VDC MGate MB3660I-8-2AC: 244 mA @ 110 VAC MGate MB3660-16-2AC: 178 mA @ 110 VAC MGate MB3660-16-2DC: 390 mA @ 24 VDC
Power Connector	Power jack	Power jack and terminal block		Terminal block			Terminal block (for DC models)
Standards and Certifications							
Safety	UL 60950-1, EN 60950-1			UL 508, EN 60950-1			UL 60950-1, EN 60950-1
Hazardous Location	–	–	–	UL/cUL Class 1 Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nA IIC T3 Gc, IECEx			–
EMC	EN 55022/24			EN 55022/24			
EMI	CISPR 22, FCC Part 15B Class A			CISPR 22, FCC Part 15B Class A			
EMS	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 1 kV (MB3180/MB3280) IEC 61000-4-5 Surge: Power: 1 kV; Signal: 2 kV (MB3480) IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11			IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m IEC 61000-4-8 PFMF IEC 61000-4-11			IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 1 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m IEC 61000-4-8 PFMF
Marine	–	–	–	DNV		–	–
Reliability							
Warranty	5 years (see www.moxa.com/warranty)						
Page	4-8	4-8	4-8	4-10	4-10	4-10	4-13

Industrial Ethernet Gateways

	MGate 4101-MB-PBS MGate 4101-MB-PBS-T MGate 4101I-MB-PBS MGate 4101I-MB-PBS-T	MGate 5101-PBM-MN MGate 5101-PBM-MN-T	MGate 5102-PBM-PN MGate 5102-PBM-PN-T	MGate 5105-MB-EIP MGate 5105-MB-EIP-T	MGate EIP3170 MGate EIP3170-T MGate EIP3170I MGate EIP3170I-T	MGate EIP3270 MGate EIP3270-T MGate EIP3270I
Ethernet Interface						
Protocols	–	Modbus TCP	PROFINET RT	EtherNet/IP, Modbus TCP	CIP (PCCC) on EtherNet/IP	
Number of Ports	–	1	2 (1 IP, Ethernet cascade)			
Connectors	–	RJ45				
Magnetic Isolation Protection	–	1.5 kV (bulit-in)				
Speed	–	10/100 Mbps, Auto MDI/MDIX				
Serial Interface 1: PROFIBUS						
Protocols	PROFIBUS DP-V0 Slave	PROFIBUS DP-V1 Master		–		
Number of Ports	1			–		
Data Rate	9600 bps to 12 Mbps			–		
Connector	DB9-F			–		
Isolation Protection	2 kV (built-in)			–		
Serial Interface 2: Modbus						
Protocols	Modbus RTU/ASCII	–	–	Modbus RTU/ASCII	DF1 (full-duplex)	
Number of Ports	1	–	–	1	1	2
Serial Standards	RS-232/422/485, software selectable	–	–	RS-232/422/485, software selectable	RS-232/422	
Connectors	DB9-M	–	–	DB9-M	RS-232: DB9-M, RS-422: Terminal block	DB9-M
ESD Protection	15 kV	–	–	–	15 kV	
RS-485 Data Direction Control	ADDC®	–	–	ADDC®		
Serial Communication Parameters	Data Bits: 7, 8 Stop Bits: 1, 2	–	–	Data Bits: 7, 8 Stop Bits: 1, 2	Data Bits: 8 Stop Bits: 1, 2	
Parity	None, Even, Odd, Space, Mark	–	–	None, Even, Odd, Space, Mark	None, Even, Odd	
Flow Control	RTS/CTS, DTR/DSR (RS-232 only)	–	–	RTS/CTS, RTS Toggle (RS-232 only)	RTS/CTS, DTR/DSR (RS-232 only)	
Baudrate	50 bps to 921.6 Kbps	–	–	50 bps to 921.6 kbps	1200 bps to 921.6 Kbps	
Isolation Protection	2 kV (built-in, -I model only)	–	–	2 kV (built-in)	2 kV (built-in, -I model only)	
Software						
Utility	MGate Manager for Windows 2000, Windows XP, Server 2003, Vista, Server 2008 (x86/x64), Windows Server 2008 R2, Windows 7/8/8.1 (x86/x64), Windows Server 2012 (x64), Windows 2012 R2					
QuickLink	✓	–	–	–	–	
Paging	✓	–	–	–	–	
AutoScan	–	✓	✓	–	–	
MXview/Mxconfig	–	✓	✓	✓	✓	
SNMP	–	v1, v2, v3, Private MIB			v1 (read only)	
Physical Characteristics						
Housing	Metal (IP30)				Plastic (IP30)	
Dimensions	36 x 105 x 140 mm (1.42 x 4.14 x 5.51 in)				29 x 89.2 x 118.5 mm (1.14 x 3.51 x 4.67 in)	
Weight	500 g (1.10 lb)			507 g (1.12 lb)	360 g (0.79 lb)	380 g (0.84 lb)
Storage Card Slot	–		1 microSD (SDHC) card slot (supports up to 32 GB)		–	
Environmental Limits						
Operating Temperature	Standard Models: 0 to 60°C (32 to 140°F), Wide Temp. Models: -40 to 75°C (-40 to 167°F)					
Storage Temperature	-40 to 85°C (-40 to 185°F)					
Ambient Relative Humidity	5 to 95% RH (non-condensing)					
Shock	IEC 60068-2-27					
Drop	IEC 60068-2-32					
Vibration	IEC 60068-2-6, IEC 60068-2-64					
Power Requirements						
Input Voltage	12 to 48 VDC					
Input Current	MGate 4101-MB-PBS: 340 mA @ 12 VDC; 130 mA @ 48 VDC MGate 4101I-MB-PBS: 375 mA @ 12 VDC; 140 mA @ 48 VDC	365 mA @ 12 VDC	430 mA @ 12 VDC	455 mA @ 12 VDC; 125 mA @ 48 VDC	MGate EIP3170: 435 mA @ 12 VDC MGate EIP3170I: 555 mA @ 12 VDC	MGate EIP3270: 435 mA @ 12 VDC MGate EIP3270I: 510 mA @ 12 VDC
Power Connector	Terminal block					
Standards and Certifications						
Safety	UL 60950-1, EN 60950-1		UL 508, EN 60950-1			
Hazardous Location	Class 1 Division 2, ATEX, IECEx					
EMC	EN 55022/24					
EMI	CISPR 22, FCC Part 15B Class A		CISPR 22, FCC Part 15B Class B		CISPR 22, FCC Part 15B Class A	
EMS	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m IEC 61000-4-8 PFMF	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m IEC 61000-4-8 PFMF	IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m IEC 61000-4-8 PFMF	IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m IEC 61000-4-8 PFMF	IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 4 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m IEC 61000-4-8 PFMF IEC 61000-4-11	
Reliability						
Warranty	5 years (see www.moxa.com/warranty)					
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Industrial Ethernet Gateways (Wireless)

Preliminary

*Available in March, 2016

Preliminary

*Available in March, 2016

	MGate W5108 MGate W5108-T	MGate W5208 MGate W5208-T
Ethernet Interface		
Protocols	Modbus TCP, DNP3, TCP Server/Client modes supported	
Number of Ports	1	
Connectors	RJ45	
Magnetic Isolation Protection	1.5 kV (built-in)	
Speed	10/100 Mbps, Auto MDI/MDIX	
Serial Interface		
Protocols	Modbus RTU/ASCII, DNP3	
Number of Ports	1	2
Serial Standards	RS-232/422/485, software selectable	
Baudrate	50 bps to 921.6 kbps	
Flow Control	RTS/CTS, RTS Toggle (for RS-232 only), XON/XOFF (for RAW TCP only)	
Serial Communication Parameters	Data Bits: 7, 8 Stop Bits: 1, 2	
Parity	None, Even, Odd, Space, Mark	
Connector	DB9-M	
Isolation Protection	2 kV (built-in)	
Wireless Interface		
Standards	802.11 a/b/g/n	
Number of Antenma	1	
Network Mode	Infrastructure, Ad-Hoc	
Antenna Connector	Reverse SMA	
Transmission Rate	802.11a/g: 65, 54, 48, 36, 24, 18, 12, 9, 6 Mbps, auto rate; 802.11b: 11, 5.5, 2, 1 Mbps, auto rate; 802.11n 2.4 GHz: HT20, MCS 0-7; 802.11n 5 GHz: HT20 & HT40 MCS 0-7	
Transmission Distance	Up to 100 meters (in open areas)	
Inputs and Outputs		
Digital Input	2 channel	
Digital Output	2 channel	
Contact Type	6-pin terminal block	
DI: Dry Contact	On: Short to GND Off: Open	
DI: Wet Contact (source type, COM to DI)	Sensor Type: NPN Off: +3 VDC max. On: +10 to 30 V	
Digital Output (Sink Type):	On: Short to GND Off: OPEN to GND Driver Current: Max. 200 mA per channel On-state voltage: 24 VDC nominal, open collector to 30 V	
Software		
Utility	Device Search Utility (DSU) for Windows 95, 98, ME, NT, 2000, Windows XP, Server 2003, Vista, Server 2008 (x86/x64),Windows Server 2008 R2, Windows 7/8/8.1 (x86/x64), Windows Server 2012 (x64), Windows 2012 R2	
Network Protocols	TCP/IP, UDP, HTTP, SMTP, NTP, DNS, DHCP Client, ARP, Telnet	
Security	Authentication: WEP encryption (64 or 128 bit), WPA / WPA2-Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP and AES) Encryption: 128-bit TKIP/AES-CCMP EAP-TLS, PEAP/GTC, PEAP/MD5,PEAP/MSCHAPV2, EAP-TTLS/PAP, EAP-TTLS/CHAP, EAP-TTLS/MSCHAP, EAP-TTLS/MSCHAPV2, EAP-TTLS/EAP-MSCHAPV2, EAP-TTLS/EAP-GTC, EAP-TTLS/EAP-MD5, LEAP+F120	
MXview/Mxconfig	✓	
SNMP	v1, v2, v3, Private MIB	
Physical Characteristics		
Housing	Metal (IP30)	
Dimensions	45.8 x 105 x 134 mm (1.8 x 4.13 x 5.28 in)	59.6 x 101.7 x 134 mm (2.35 x 4 x 5.28 in)
Weight	589 g (1.30 lb)	738 g (1.63 lb)
Storage Card Slot	1 microSD (SDHC) card slot (supports up to 32 GB)	
Environmental Limits		
Operating Temperature	Standard Models: 0 to 60°C (32 to 140°F), Wide Temp. Models: -40 to 75°C (-40 to 167°F)	
Storage Temperature	-40 to 85°C	
Ambient Relative Humidity	5 to 95% (non-condensing)	
Shock	IEC 60068-2-27	
Drop	IEC 60068-2-32	
Vibration	IEC 60068-2-6, IEC 60068-2-64	
Power Requirements		
Input Voltage	9 to 60 VDC	
Input Current	495 mA @ 9 VDC; 202 mA @ 24 VDC; 114 mA @ 48 VDC; 99 mA @ 60 VDC	
Power Connector	3-pin terminal block	
Standards and Certifications		
Safety	UL 508, EN 60950-1	
Hazardous Location	Class 1 Division 2, ATEX, and IECEx certification processes are underway. Please contact a Moxa sales representative for details.	
EMC	EN 55022/24	
EMI	CISPR 22, FCC Part 15B Class B	
EMS	IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m IEC 61000-4-8 PFMF	
Radio	EN 300328, EN 301893, TELECOM CE (ETSI EN 301 893, ETSI EN 300 328), ARIB RCR STD-33, ARIB STD-66	
Reliability		
Warranty	5 years (see www.moxa.com/warranty)	
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Introduction to Industrial Ethernet Gateways

Get Integrated—It's Quick, Easy, and Reliable

Innovative and Easy-to-Use Industrial Gateways Create Seamless Connections and Compatibility

The need for industrial Ethernet gateway solutions is not only driven by the increasing demand for connecting industrial Ethernet protocols (such as EtherNet/IP, Modbus TCP, or PROFINET) to existing fieldbus networks, but by maximizing efficiency as well. Moxa's comprehensive industrial Ethernet gateway solutions, the MGate series, are designed with innovative and automated technology to ensure quick installation and easy management of your industrial fieldbus-to-Ethernet networks. To help users master fieldbus communications, Moxa also delivers industrial fieldbus gateways to transfer control data between different fieldbus protocols.

Quick Installation, in Just Minutes

To assist engineers of complex industrial automation systems with the troublesome configuration process, Moxa's MGate industrial gateway solution, MGate Manager, provides a user-friendly windows-based utility to make integration easier. It contains AutoCalibration or QuickLink patented technologies to enable a quick installation and configuration of industrial gateways in just minutes.

AutoCalibration

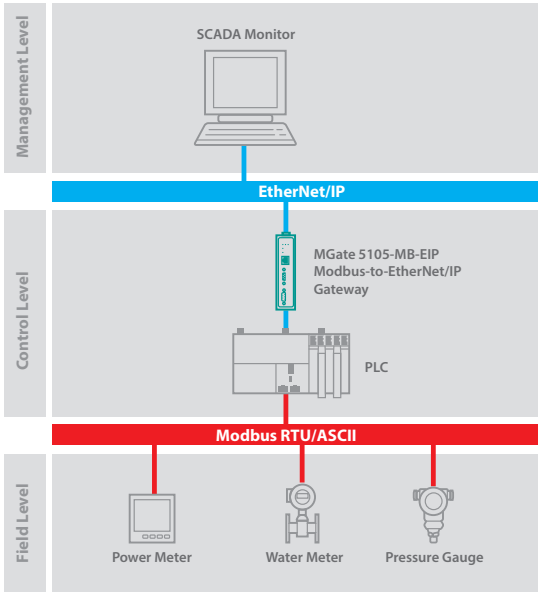
One-Click Detection of Response Timeout

In master-slave fieldbus communication networks, precise response timeout settings are an important yet complicated task for network integrators when trying to calibrate accurate timeframes to achieve optimized system performance. In the past, integrators often spent a substantial amount of time in trying to manually configure timeout settings through trial-and-error methods. Moxa's patented AutoCalibration technology offers a 1-click automated approach to auto-configure response timeout settings.

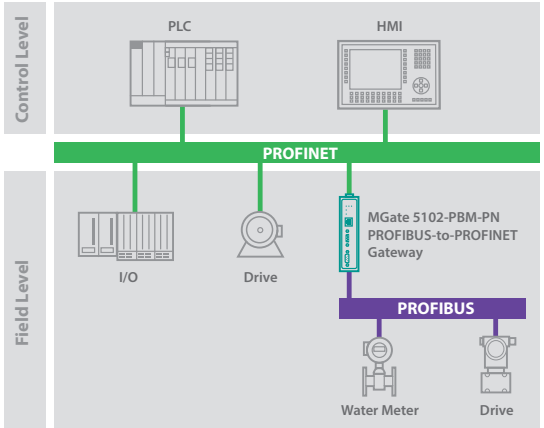
Products: MGate MB3180/3280/3480 Series, MGate MB3170/3270/3660 Series

Typical MGate Gateway Applications

- **PLC as slave:**
  Integrate field devices to allow remote monitoring and management



- **PLC as master:**
  Integrate new intelligent devices with existing devices



QuickLink

AutoLearning and AutoMapping Intelligence for Connecting Modbus to PROFIBUS

QuickLink, an innovative Moxa technology, simplifies the configuration of gateways to enable seamless connections between Modbus and PROFIBUS communications. QuickLink supports intelligent AutoLearning and AutoMapping, and replaces traditional methods of gateway configuration that are tedious and time-consuming. QuickLink is a standard feature of Moxa's MGate Manager utility that not only allows system integrators to finish their gateway configuration in just minutes, but also ensures that configurations are done right the first time, virtually eliminating the possibility of human error.

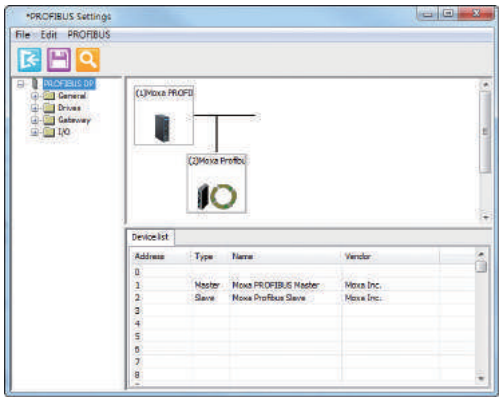
Products: MGate 4101-MB-PBS Series

AutoScan

One-Click Detection of I/O Parameters

Moxa's industrial Ethernet gateways feature AutoScan, which detects all connected PROFIBUS slave devices and their available Read Configuration Data (Get_Cfg). After configuration is done, an easy-to-read data mapping table is created to assist in the configuration of Modbus TCP masters, such as SCADA servers and PLCs. With Moxa's AutoScan, you no longer need to spend a lot of time configuring devices yourself, but instead can focus on monitoring data without needing to worry about every different protocol.

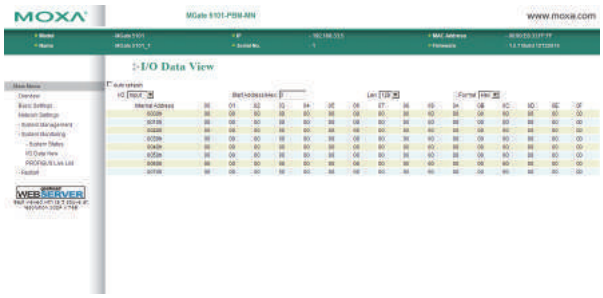
Products: MGate 5101-PBM-MN Series, MGate 5102-PBM-PN Series



Easy to Maintain, with Built-in Monitoring and Diagnostics

Web-based Monitoring Tool

Moxa's industrial Ethernet gateways feature a web-based monitoring tool that supports data import/export and log recording capabilities. The monitoring tool streamlines device configuration, maintenance, and troubleshooting, and supports encryption functions such as HTTPS and SSH to prevent unauthorized access. With this tool, users can reduce their cost since they won't need to purchase additional monitoring tools.



Real-Time Control of Fieldbus-to-Ethernet Networks

Real-time monitoring is critical for any industrial system, and Moxa's MGate Manager Windows utility is not only designed for easy configuration, but also for uninterrupted monitoring and troubleshooting of the connections between the fieldbus system and remote control system. MGate Manager logs events initiated by the gateway, and records all commands and responses that pass through the gateway, assisting users in determining the root cause of failures and identifying performance bottlenecks. The automatic relay output warning for the Ethernet link and power input status gives maintenance engineers an intelligent notification tool for quick troubleshooting and easy maintenance.

Reliable Performance, for Uninterrupted Operation

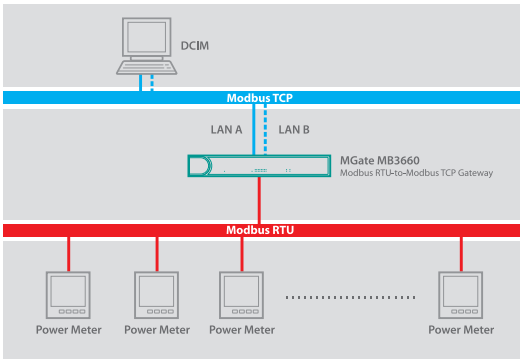
For mission-critical industrial applications, the failure of a single link can affect operational efficiency. Moxa's gateways are certified for use in hazardous environments (ATEX Zone 2, Class 1 Division 2), support a -40 to 75°C wide operating temperature (the highest operating temperature on the market; available with some models), and feature dual power inputs for connecting to a redundant power source to ensure reliable performance. In addition, Moxa gateways are recognized by several important organizations, such as PROFIBUS & PROFINET International (PI), Open DeviceNet Vendors Association (ODVA™), and the Modbus Organization (Modbus.org).

Applications

Data Center Power Monitoring

Modbus RTU/ACSII to Modbus TCP

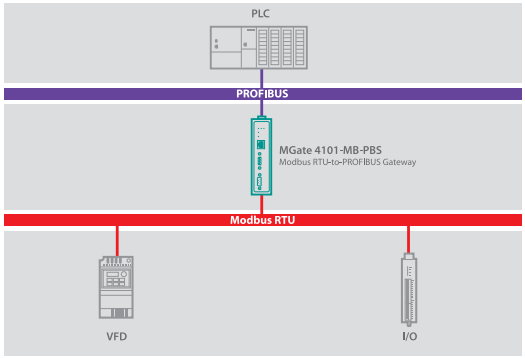
Data centers and server rooms use a significant amount of energy, with many industrial facilities spending nearly 25% of their total operating budget on this expense. Consumption is measured by power meters located throughout the facility, with many of the meters integrated with a Modbus RTU. Data from the meters is transmitted via an industrial gateway to a Modbus TCP network, and finally to a DCIM (data center infrastructure management) system.



Production Line Control

Modbus RTU/ASCII to PROFIBUS

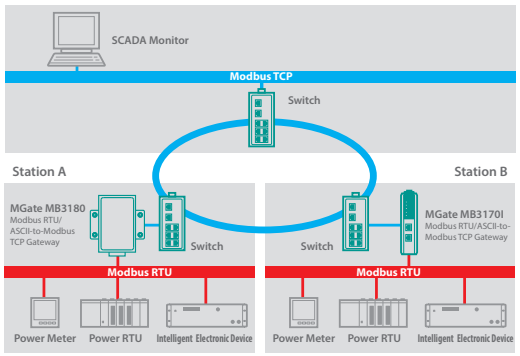
As labor costs increase year after year, manufacturers have transitioned to using automation systems to reduce labor costs, with PLCs used as one solution to accomplish this. Most devices still use Modbus RTU, which is the most common protocol. For this reason, industrial Ethernet gateways are the right choice for converting Modbus RTU to PROFIBUS, which can be controlled by PROFIBUS PLCs.



Monitoring a Small-Scale Power Generation System

Modbus RTU/ASCII to Modbus TCP

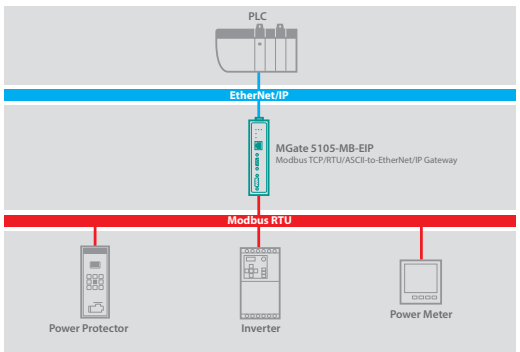
Industrial plants often have their own power generation systems to provide an uninterrupted power supply. To enable continuous monitoring, Modbus is commonly adopted as a communication protocol to transmit large volumes of Modbus RTU monitoring information from power RTUs, Intelligent Electronic Devices, and meters, via industrial gateways to the process control system running on a Modbus TCP network.



Electric Control Panel Monitoring

Modbus RTU/ASCII to EtherNet/IP

EtherNet/IP is a communication protocol developed by Rockwell Automation, and is widely used in many large-scale power systems for remote monitoring to ensure reliable performance and energy control. Although ControlLogix PLCs support Modbus modules for connecting a Modbus RTU to EtherNet/IP, it may be too expensive to modify the PLC code and a convenient rack slot may not be available. For this reason, gateways have become a popular way to achieve Modbus communication requirements.



MGate™ MB3180/3280/3480

1, 2, and 4-port standard serial-to-Ethernet Modbus gateways

- Convert between Modbus TCP and Modbus RTU/ASCII
- 1 Ethernet port and 1, 2, or 4 RS-232/422/485 ports
- 16 simultaneous TCP masters with up to 32 simultaneous requests per master
- Easy hardware setup and configuration

Overview

The MB3180, MB3280, and MB3480 are standard Modbus gateways that convert between Modbus TCP and Modbus RTU/ASCII protocols. Up to 16 simultaneous Modbus TCP masters are supported, with up to 31 RTU/ASCII slaves per serial port. For RTU/ASCII masters, up to 32 TCP slaves are supported.

Standard Modbus Network Integration

The three standard MGate™ models (MB3180, MB3280, and MB3480) are designed for easy integration of Modbus TCP and RTU/ASCII networks. With these models, Modbus serial slave devices can be seamlessly incorporated into an existing Modbus TCP network, and Modbus TCP slaves can be made accessible to serial masters. The MB3180, MB3280, and MB3480 offer features that make network integration easy, customizable, and compatible with almost any Modbus network.

High Density, Cost-effective Gateways

The MGate™ MB3000 gateways can effectively connect a high density of Modbus nodes to the same network. The MB3280 can manage up to 62 serial slave nodes, and the MB3480 can manage up to 124 serial slave nodes. Each RS-232/422/485 serial port can be configured individually for Modbus RTU or Modbus ASCII operation and for different baudrates, allowing both types of networks to be integrated with Modbus TCP through one Modbus gateway.

Specifications

Ethernet Interface

Protocols: Modbus TCP
Number of Ports: 1
Speed: 10/100 Mbps, Auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 kV (built-in)

Serial Interface

Protocol: Modbus RTU/ASCII Slave/Master
Number of Ports:
MB3180: 1
MB3280: 2
MB3480: 4
Serial Standards: RS-232/422/485, software selectable
Connectors: DB9 male
ESD Protection: 15 kV for all signals
RS-485 Data Direction Control: ADDC® (automatic data direction control)

Serial Communication Parameters

Data Bits: 7, 8
Stop Bits: 1, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, DTR/DSR, RTS Toggle (RS-232 only)
Baudrate: 50 bps to 921.6 kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Configuration Options: Web Console, Serial Console, Telnet Console, Windows Utility
Utility: MGate Manager for Windows 2000, Windows XP, Server 2003, Vista, Server 2008 (x86/x64), Windows Server 2008 R2, Windows 7/8/8.1 (x86/x64), Windows Server 2012 (x64), Windows 2012 R2
Multi-master and Multi-drop:
Master mode: 32 TCP slaves
Slave mode: 16 TCP masters (request queue 32-deep for each master)
Support: Smart Routing, MXview, SNMP v1 (read only)

Physical Characteristics

Housing: Metal, IP30
Weight:
MGate MB3180: 340 g (0.75 lb)
MGate MB3280: 360 g (0.79 lb)
MGate MB3480: 740 g (1.63 lb)
Dimensions:
Without ears:
MB3180: 22 x 52 x 80 mm (0.87 x 2.05 x 3.15 in)
MB3280: 22 x 77 x 111 mm (0.87 x 3.03 x 4.37 in)
MB3480: 35.5 x 102.7 x 157.2 mm (1.40 x 4.04 x 6.19 in)

With ears:
MB3180: 22 x 75 x 80 mm (0.87 x 2.95 x 3.15 in)
MB3280: 22 x 100 x 111 mm (0.87 x 3.94 x 4.37 in)
MB3480: 35.5 x 102.7 x 181.3 mm (1.40 x 4.04 x 7.14 in)

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current:
MGate M3180: 200 mA @ 12 VDC
MGate M3280: 250 mA @ 12 VDC
MGate M3480: 385 mA @ 12 VDC
Power Connector:
MGate MB3180: Power jack
MGate MB3280/3480: Power jack and terminal block

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 1 kV (MB3180/MB3280)
IEC 61000-4-5 Surge: Power: 1 kV; Signal: 2 kV (MB3480)
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11

MTBF (mean time between failures)

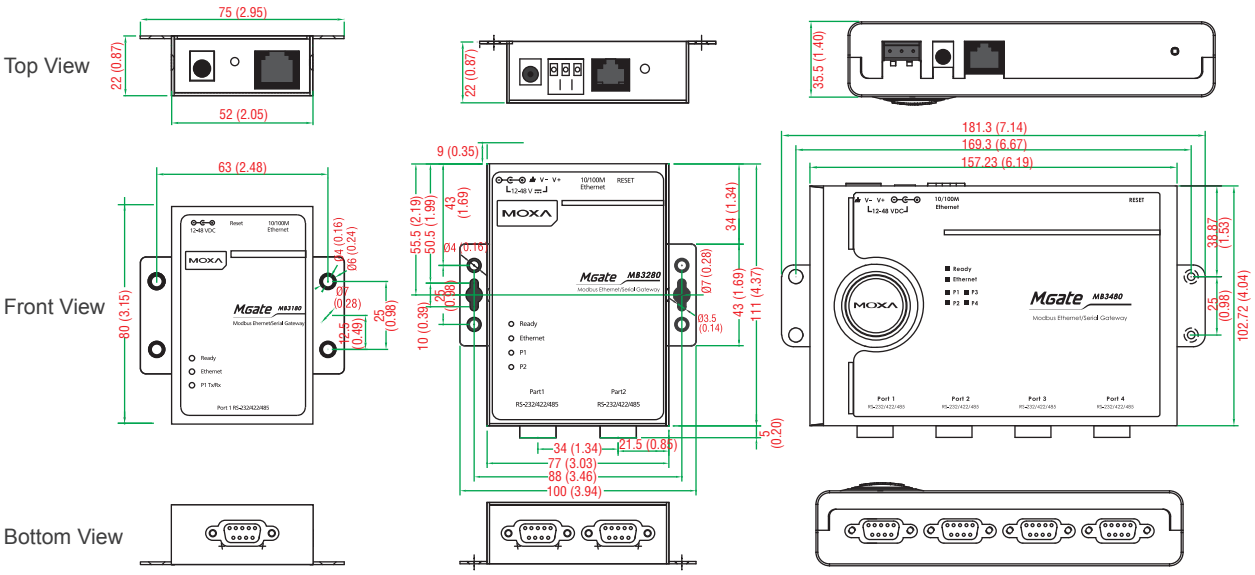
Time:
MGate M3180: 628,376 hrs
MGate M3280: 503,029 hrs
MGate M3480: 295,812 hrs
Standard: Telcordia SR332

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

MGate MB3180: 1-port standard Modbus gateway
MGate MB3280: 2-port standard Modbus gateway
MGate MB3480: 4-port standard Modbus gateway

Optional Accessories (can be purchased separately)

CBL-RJ458P-100: 8-pin RJ45 CAT5 Ethernet cable, 100 cm
CBL-F9M9-150: DB9 female to DB9 male serial cable, 150 cm
CBL-F9M9-20: DB9 female to DB9 male serial cable, 20 cm
CBL-RJ45SF9-150: RJ45 to DB9 female shielded serial cable, 150 cm
ADP-RJ458P-DB9F: DB9 female to RJ45 connector
A-ADP-RJ458P-DB9F-ABC01: DB9 female to RJ45 connector
Mini DB9F-to-TB: DB9 female to terminal block connector
DK35A: DIN-rail mounting clips, 35 mm, 2 DIN-rail plates with 4 screws
One power adapter suitable for your region is included in the product package. Additional power adapters can be purchased separately. Please refer to Appendix for detail.

Package Checklist

- 1 MGate MB3180 or MB3280 or MB3480 Modbus gateway
- 100 to 240 VAC power adapter (excluding T models)*
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

*The package includes one power adapter suitable for your region.

DK35A

MGate™ MB3170/3270

1 and 2-port advanced serial-to-Ethernet Modbus gateways

- Accessible by up to 16 TCP master/client devices, or connect to up to 32 TCP slave/server devices
- Supports up to 31 or 62 serial slave devices
- Ethernet cascading for easy wiring
- Serial port routing by IP address, TCP port, or ID mapping
- Serial redirector function provided
- Embedded Modbus traffic monitor
- 10/100BaseTX (RJ45) or 100BaseFX (single mode or multi-mode with SC/ST connector)
- Emergency request tunnels ensure QoS control

ProCOM

IEC IECEx Ex cULus LISTED DNV-GL CE FC

Overview

The MGate MB3170 and MB3270 are 1 and 2-port Modbus gateways, respectively, that convert between Modbus TCP, ASCII, and RTU communications protocols. The gateways provide both serial-to-Ethernet communication and serial (Master) to serial (Slave) communications. In addition, the gateways support simultaneously connecting serial and Ethernet masters with serial Modbus devices. The MGate MB3170 and MB3270 series gateways can be accessed by up to 16 TCP master/clients or connect to up to 32 TCP slave/servers. Routing through the serial ports can be controlled by IP address, TCP port number, or ID mapping. A featured priority control function allows urgent commands to obtain an immediate response. All models are rugged, DIN-rail mountable, and offer optional built-in optical isolation for serial signals.

Integrate TCP Masters without Altering the Modbus RTU/ASCII Network or Software

The MB3270 can integrate Modbus TCP with Modbus RTU/ASCII, without modifying the existing Modbus RTU/ASCII architecture or software. With the serial redirector function, a serial master can maintain direct access to serial slave devices through a specially mapped serial port. This allows the serial and TCP masters to access serial slaves simultaneously.

Optical Fiber for Ethernet Communications

The MGate MB3170 fiber series includes 100BaseFX fiber models that support transmission distances up to 4 km for multi-mode models, and up to 40 km for single-mode models. Optical fiber is well-suited for industrial applications because it is immune to electromagnetic noise and interference. For environments that experience high ground loop voltages, fiber provides the best isolation protection, and because there is no danger of sparking, optical fiber is safer than copper wire to use in hazardous environments.

Priority Control for Urgent Commands (Patented)

As Modbus networks increase in size and complexity, the lag time between commands and responses becomes a major concern. Advanced models of the MB3000 series provide a priority control function for urgent commands, allowing users to force certain commands to get an immediate response. Depending on your system's requirements, different methods are available to define which commands receive priority.

Patent Numbers: (US/TW)
US7,743,192 B2 / I332618
US7,725,635 B2 / I321007

Specifications

Ethernet Interface

Protocols: Modbus TCP
Number of Ports: 2 (1 IP, Ethernet cascade)
Speed: 10/100 Mbps, Auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 kV (built-in)

Optical Fiber Interface

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Serial Interface

Protocol: Modbus RTU/ASCII Master/Slave
Number of Ports:
MB3170/3170I: 1
MB3270/3270I: 2
Serial Standards: RS-232/422/485, software selectable
Connectors:
MB3170/3170I: DB9 male for RS-232, terminal block for RS-422/485
MB3270/3270I: DB9 male x 2
Magnetic Isolation Protection: 2 kV (for "I" models)
ESD Protection: 15 kV for all signals
RS-485 Data Direction Control: ADDC® (automatic data direction control)
Pull High/Low Resistor for RS-485: 1 kΩ, 150 kΩ
Terminator for RS-485: 120 Ω

Serial Communication Parameters

Data Bits: 7, 8
Stop Bits: 1, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, DTR/DSR, RTS Toggle (RS-232 only)
Baudrate: 50 bps to 921.6 kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Configuration Options: Web Console, Serial Console, Telnet Console, Windows Utility
Utility: MGate Manager for Windows2000, Windows XP, Server 2003, Vista, Server 2008 (x86/x64), Windows Server 2008 R2, Windows 7/8/8.1 (x86/x64), Windows Server 2012 (x64), Windows 2012 R2
Multi-master and Multi-drop:
Master mode: 32 TCP slaves
Slave mode: 16 TCP masters (request queue 32-deep for each master)
Support: Smart Routing, Serial Redirection, ProCOM, Priority Control, MXview, SNMP v1 (read only)

Physical Characteristics

Housing: Plastic, IP30
Weight:
MGate MB3170: 360 g (0.79 lb)
MGate MB3270: 380 g (0.84 lb)
Dimensions:
Without ears: 29 x 89.2 x 118.5 mm (1.14 x 3.51 x 4.67 in)
With ears extended: 29 x 89.2 x 124.5 mm (1.14 x 3.51 x 4.90 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Vibration: IEC 60068-2-6, IEC 60068-2-64
Shock: IEC 60068-2-27
Drop: IEC 60068-2-32

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current:
MGate MB3170: 435 mA @ 12 VDC
MGate MB3170I: 555 mA @ 12 VDC
MGate MB3270: 435 mA @ 12 VDC
MGate MB3270I: 510 mA @ 12 VDC
MGate MB3170-M-SC: 510 mA @ 12 VDC
MGate MB3170-M-ST: 435 mA @ 12 VDC
MGate MB3170-S-SC: 555 mA @ 12 VDC
MGate MB3170I-M-SC: 555 mA @ 12 VDC
MGate MB3170I-S-SC: 555 mA @ 12 VDC
Power Connector: Terminal block
Relay Output: 1 digital relay output to alarm (normal closed), with current carrying capacity 1 A @ 30 VDC

Standards and Certifications

Safety: UL 508, EN 60950-1
Hazardous Location: Class 1 Division 2, ATEX, IECEx
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11
Marine: DNV

MTBF (mean time between failures)

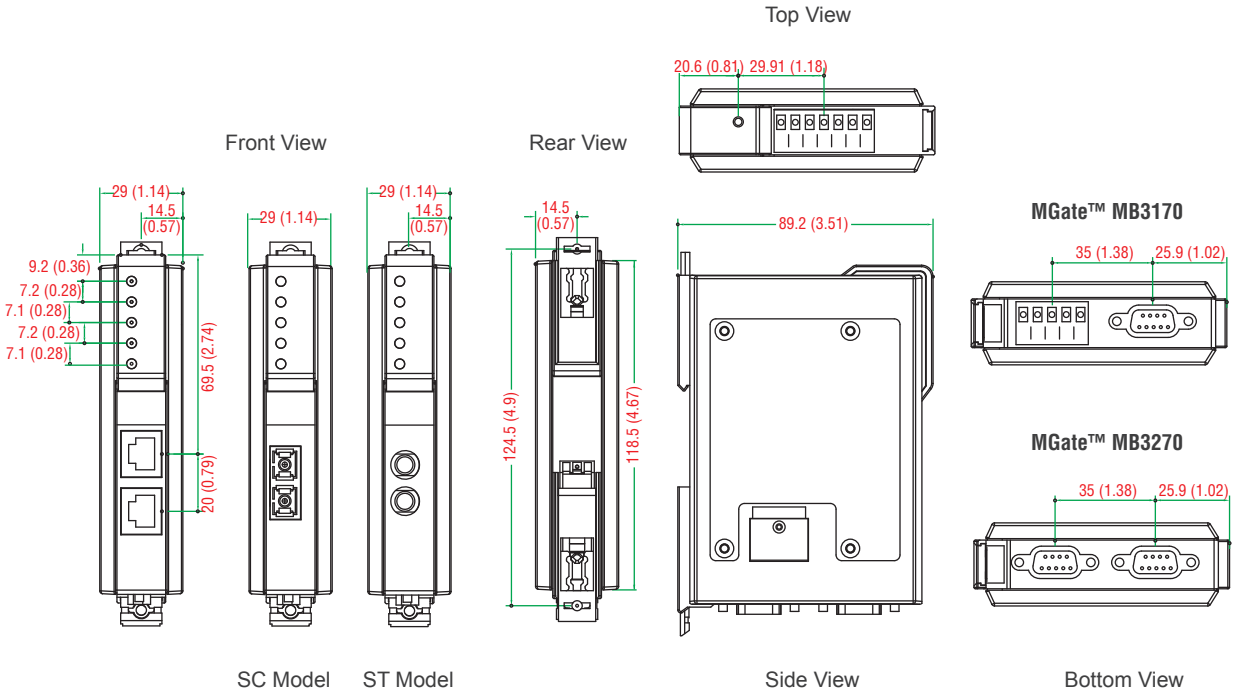
Time:
MGate MB3170: 346,790 hrs
MGate MB3170-M-SC: 1,175,887 hrs
MGate MB3170-M-ST: 1,175,887 hrs
MGate MB3170-S-SC: 1,175,887 hrs
MGate MB3170I-M-SC: 768,343 hrs
MGate MB3170I-S-SC: 763,707 hrs
MGate MB3270: 342,098 hrs
Standard: Telcordia SR332

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

MGate MB3170: 1-port advanced Modbus gateway, 0 to 60°C operating temperature
MGate MB3170I: 1-port advanced Modbus gateway with 2 kV isolation, 0 to 60°C operating temperature
MGate MB3270: 2-port advanced Modbus gateway, 0 to 60°C operating temperature
MGate MB3270I: 2-port advanced Modbus gateway with 2 kV isolation, 0 to 60°C operating temperature
MGate MB3170-T: 1-port advanced Modbus gateway, -40 to 75°C operating temperature
MGate MB3170I-T: 1-port advanced Modbus gateway with 2 kV isolation, -40 to 75°C operating temperature
MGate MB3270-T: 2-port advanced Modbus gateway, -40 to 75°C operating temperature
MGate MB3270I-T: 2-port advanced Modbus gateway with 2 kV isolation, -40 to 75°C operating temperature
MGate MB3170-M-SC: 1-port advanced Modbus gateway with 100BaseFX multi-mode fiber port (SC connector), 0 to 60°C operating temperature
MGate MB3170-M-SC-T: 1-port advanced Modbus gateway with 100BaseFX multi-mode fiber port (SC connector), -40 to 75°C operating temperature
MGate MB3170-M-ST: 1-port advanced Modbus gateway with 100BaseFX multi-mode fiber port (ST connector), 0 to 60°C operating temperature
MGate MB3170-M-ST-T: 1-port advanced Modbus gateway with 100BaseFX multi-mode fiber port (ST connector), -40 to 75°C operating temperature
MGate MB3170-S-SC: 1-port advanced Modbus gateway with 100BaseFX single-mode fiber port (SC connector), 0 to 60°C operating temperature
MGate MB3170-S-SC-T: 1-port advanced Modbus gateway with 100BaseFX single-mode fiber port (SC connector), -40 to 75°C operating temperature
MGate MB3170I-M-SC: 1-port advanced Modbus gateway with 100BaseFX multi-mode fiber port (SC connector) and 2 kV optical isolation, 0 to 60°C operating temperature
MGate MB3170I-M-SC-T: 1-port advanced Modbus gateway with 100BaseFX multi-mode fiber port (SC connector) and 2 kV optical isolation, -40 to 75°C operating temperature
MGate MB3170I-S-SC: 1-port advanced Modbus gateway with 100BaseFX single-mode fiber port (SC connector) and 2 kV optical isolation, 0 to 60°C operating temperature
MGate MB3170I-S-SC-T: 1-port advanced Modbus gateway with 100BaseFX single-mode fiber port (SC connector) and 2 kV optical isolation, -40 to 75°C operating temperature

Package Checklist

- 1 MGate MB3170 or MB3270 Modbus gateway
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

Mini DB9F-to-TB: DB9 female to terminal block connector

One power adapter suitable for your region is included in the product package. Additional power adapters can be purchased separately. Please refer to Appendix A for details.

MGate™ MB3660 Series

8 and 16-port redundant Modbus gateways

- Innovative Command Learning eliminates the need to key-in SCADA Modbus commands (acts as an agent gateway)
- High performance through active and parallel polling of serial devices
- Supports serial (Master) to serial (Slave) communications
- 2 Ethernet ports with the same IP or dual IP addresses
- SD card for configuration backup
- Access by up to 256 TCP master/client devices, or connect to 128 TCP slave/server devices
- Dual VDC or VAC power inputs with wide power input range
- 3-pin fault relay circuit for event alarms
- 2 kV isolation protection (for "-I" models)

Overview

The MGate MB3660 (MB3660-8 and MB3660-16) series gateways are redundant Modbus gateways that convert between the Modbus TCP and Modbus RTU/ASCII protocols. They can be accessed by up to 256 TCP master/client devices, or connect to 128 TCP slave/server devices. The MGate MB3660 series isolation model provides 2 kV isolation protection suitable for power substation applications. The MGate MB3660 gateways are designed to easily integrate Modbus TCP and RTU/ASCII networks. The MGate MB3660 series gateways offer features that make network integration easy, customizable, and compatible with almost any Modbus network.

For large-scale Modbus deployments, MGate MB3660 gateways can effectively connect a large number of Modbus nodes to the same network. The MB3660 series can physically manage up to 248 serial slave nodes for 8-port models or 496 serial slave nodes for 16-port models (the Modbus standard only defines Modbus IDs from 1 to 247). Each RS-232/422/485 serial port can be configured individually for Modbus RTU or Modbus ASCII operation and for different baudrates, allowing both types of networks to be integrated with Modbus TCP through one Modbus gateway.

High Performance with Innovative Command Learning

The MGate MB3660 series gateways support two communication modes: transparent mode and agent mode. For transparent mode, the gateway converts Modbus commands from Modbus TCP to Modbus RTU/ASCII, and vice versa, or from serial (Master) to serial (Slave). However, since only one Modbus protocol request-response action can be executed at any given time, each Modbus device has to wait its turn, resulting in poorer performance. Agent mode is designed to overcome this performance weakness. By allowing users to manually key in Modbus commands, the gateway can send Modbus commands to multiple Modbus devices at the same time. Since the gateway actively and continuously retrieves data from Modbus devices simultaneously through the different serial ports, users will see a dramatic reduction in the amount of time a Modbus device needs to wait to be accessed. SCADA systems can retrieve Modbus device data directly from the gateway's memory, instead of waiting for the gateway to pass commands to the serial ports, enhancing the Modbus gateway's communication performance.

Transparent mode helps users adopt existing SCADA programs, but with reduced communication performance, whereas agent mode is characterized by high performance, but requires users to go through the trouble of keying in Modbus commands. In order to provide better performance, without requiring users to key in a lot of Modbus commands, the MGate MB3660 series gateways are designed with an innovative Command Learning function, which can be activated with a single mouse click. Once activated, the gateway will learn and remember the Modbus commands it receives, and once a command has been learned, the gateway will act as though it were in agent mode, and actively send Modbus requests to the relevant Modbus devices. Since the data is saved in a different memory space that can be accessed by the SCADA system, the SCADA system can retrieve Modbus response data directly from the gateway's memory, instead of waiting for the data to pass through the Modbus devices, dramatically increasing communication performance.

Modbus Gateway with Power and Ethernet Redundancy

For a complicated Modbus system, redundancy is extremely important. The MGate MB3660 Modbus gateways support redundancy for both the power input and Ethernet connection. The MGate MB3660 gateways come with dual AC or DC power inputs built-in for power redundancy, and have dual Ethernet ports (with different IPs) for network redundancy. To accomodate different types of applications, the dual Ethernet ports can be configured in one of two ways:

1. Use the same IP for both Ethernet ports. In this case, the MGate MB3660 gateway will automatically switch to the backup LAN when the main LAN fails.
2. Use different IP addresses for each of the two Ethernet ports.

Specifications

Ethernet Interface

Protocols: Modbus TCP Client/Server
Number of Ports: 2 (2 IP addresses)
Speed: 10/100 Mbps, Auto MDI/MDIX
Connector: RJ45 x 2

Serial Interface

Protocols: Modbus RTU/ASCII Master/Slave
Number of Ports:
MGate MB3660-8: 8
MGate MB3660I-8: 8
MGate MB3660-16:16
Serial Standards: RS-232/422/485, software selectable
Connectors: DB9 male
RS-485 Data Direction Control: ADDC® (automatic data direction control)
Isolation Protection: 2 kV (for "-I" model)

Serial Communication Parameters

Data Bits: 7, 8
Stop Bits: 1, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, DTR/DSR, RTS Toggle (RS-232 only)
Baudrate: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Configuration Options: Web console, Serial console, Telnet console
Utility: Device Search Utility (DSU) for Windows 95, 98, ME, NT, 2000, Windows XP, Server 2003, Vista, Server 2008 (x86/x64), Windows Server 2008 R2, Windows 7/8/8.1 (x86/x64), Windows Server 2012 (x64), Windows 2012 R2
Network Protocols: TCP/IP, UDP, HTTP, SMTP, NTP, DNS, DHCP Client, SNMPv1 (read only), ARP, Telnet, Radius
Multi-master and Multi-drop:
Master mode: 128 TCP slaves/servers
Slave mode: 256 TCP masters/clients

Physical Characteristics

Fault Relay Circuit: 3-pin circuit with current carrying capacity of 2 A @ 30 VDC
External Storage Drive: SD card for configuration backup
Housing: Metal, IP30
Weight:
MGate MB3660-8-2AC: 2,731 g (6.02 lb)
MGate MB3660-8-2DC: 2,684 g (5.92 lb)
MGate MB3660I-8-2AC: 2,753 g (6.07 lb)
MGate MB3660-16-2AC: 2,830 g (6.24 lb)
MGate MB3660-16-2DC: 2,780 g (6.13 lb)
Dimensions:
Without ears: 440 x 45 x 198 mm (17.32 x 1.77 x 7.80 in)
With ears: 480 x 45 x 198 mm (18.90 x 1.77 x 7.80 in)

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Vibration: IEC 60068-2-6, IEC 60068-2-64
Shock: IEC 60068-2-27
Drop: IEC 60068-2-32

Power Requirements

Input Voltage:
For DC models: Dual 20 to 60 VDC (1.5 kV isolation)
For AC models: Dual 100 to 240 VAC, 47 to 63 Hz
Input Current:
MGate MB3660-8-2AC: 144 mA @ 110 VAC; 101 mA @ 220 VAC
MGate MB3660-8-2DC: 312 mA @ 24 VDC; 156 mA @ 48 VDC
MGate MB3660I-8-2AC: 244 mA @ 110 VAC; 159 mA @ 220 VAC
MGate MB3660-16-2AC: 178 mA @ 110 VAC; 120 mA @ 220 VAC
MGate MB3660-16-2DC: 390 mA @ 24 VDC; 195 mA @ 48 VDC
Power Connector: Terminal block (for DC models)

Standards and Certifications

Safety: UL 60950-1, EN 60950-1 (LVD)
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10V/m
IEC 61000-4-8 PFMF

MTBF (mean time between failures)

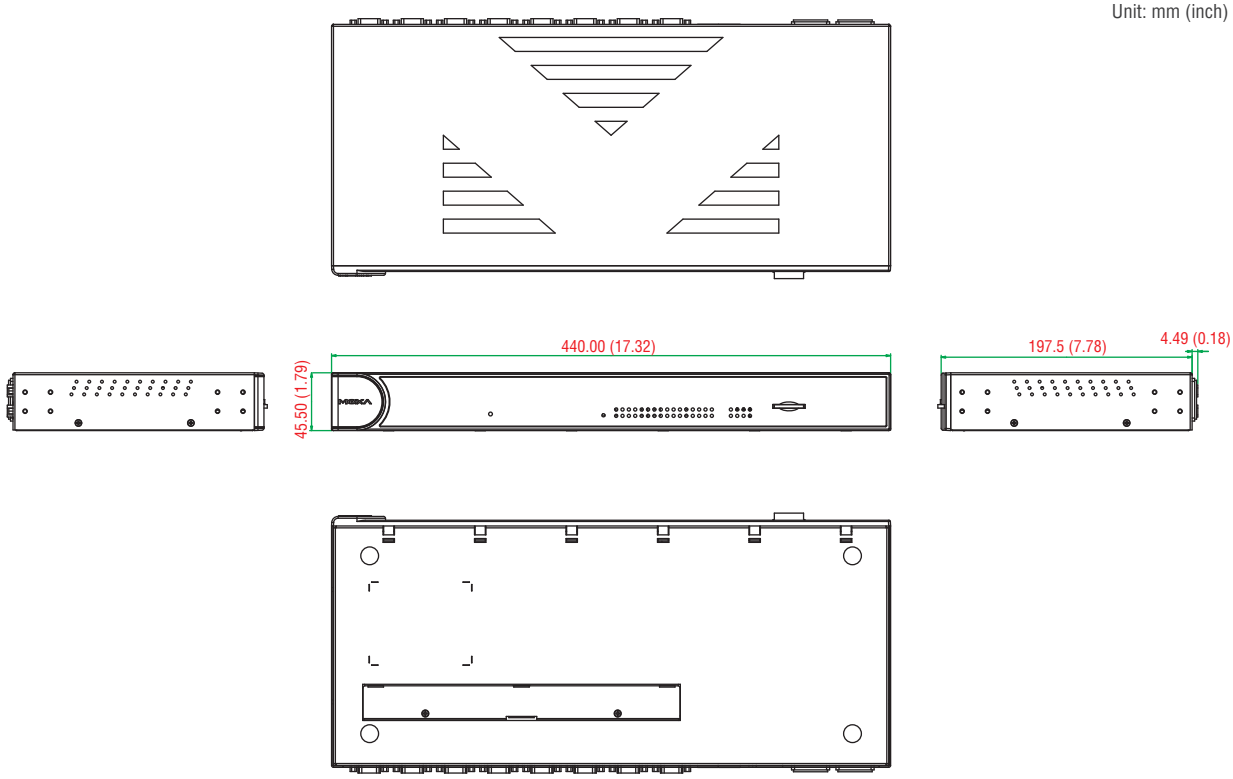
Time:
MGate MB3660-8-2AC: 716,647 hrs
MGate MB3660-8-2DC: 706,783 hrs
MGate MB3660I-8-2AC: 224,851 hrs
MGate MB3660-16-2AC: 487,416 hrs
MGate MB3660-16-2DC: 482,835 hrs
Standard: Telcordia SR332

Warranty

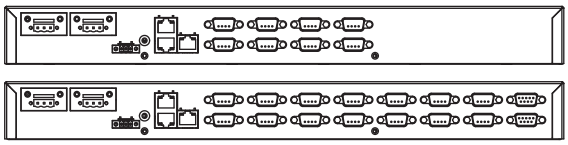
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

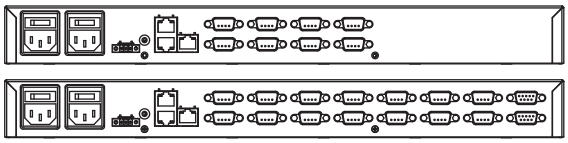
Unit: mm (inch)



DC Models



AC Models



Ordering Information

Available Models

MGate MB3660-8-2AC: Modbus gateway with dual LANs, dual AC power inputs, 8 RS-232/422/485 ports, 0 to 60°C operating temperature
MGate MB3660-8-2DC: Modbus gateway with dual LANs, dual DC power inputs, 8 RS-232/422/485 ports, 0 to 60°C operating temperature
MGate MB3660I-8-2AC: Modbus gateway with dual LANs, dual AC power inputs, 8 RS-232/422/485 ports, 0 to 60°C operating temperature, 2 kV isolation
MGate MB3660-16-2AC: Modbus gateway with dual LANs, dual AC power inputs, 16 RS-232/422/485 ports, 0 to 60°C operating temperature
MGate MB3660-16-2DC: Modbus gateway with dual LANs, dual DC power inputs, 16 RS-232/422/485 ports, 0 to 60°C operating temperature

Optional Accessories (can be purchased separately)

Mini DB9F-to-TB: DB9 female to terminal block connector
One power adapter suitable for your region is included in the product package. Additional power adapters can be purchased separately. Please refer to the Appendix for details.

Package Checklist

- 1 MGate MB3660-8 or MB3660-16 Modbus gateway
- 1 serial cable: DBL-RJ45F9-150
- 2 L-shaped brackets for wall mounting
- 2 power cords (suitable for your region)
- Documentation and software CD
- Quick installation guide
- Warranty card

MGate™ 4101-MB-PBS Series

1-port Modbus RTU/ASCII-to-PROFIBUS slave gateways

- Protocol conversion between Modbus and PROFIBUS
- Windows utilities with innovative QuickLink function for automatic configuration within minutes
- Redundant dual DC power inputs and relay output supported
- Embedded data packet analyzer
- Powerful and visual diagnostic tool
- -40 to 75°C wide operating temperature models available

Overview

The MGate 4101-MB-PBS gateway provides a communication portal between PROFIBUS PLCs (e.g. Siemens S7-400 and S7-300 PLCs) and Modbus devices. With the QuickLink feature, I/O mapping can be accomplished within a matter of minutes. All models are protected with a rugged metallic casing, are DIN-rail mountable, and offer optional built-in optical isolation.

QuickLink and Windows Utilities for Easy Setup and Traffic Monitoring

The QuickLink windows utility uses a serial console port to connect to the MGate 4101-MB-PBS and makes configuration and operation as easy as possible. QuickLink can finish the configuration in just a few minutes by passively detecting Modbus requests with the AutoLearning function, and performing error-free I/O mapping with the AutoMapping feature. QuickLink drastically reduces Modbus-to-PROFIBUS integration time when compared to conventional I/O mapping, which can easily require days to complete. Additionally, embedded monitoring tools can maintain logs of Modbus communication packets and assist in troubleshooting.

Redundant Power Inputs

The MGate 4101-MB-PBS has dual power inputs for greater reliability. The power inputs allow simultaneous connections to two live DC power sources, so that continuous operation is provided even if one power source fails. The higher level of reliability makes these advanced Modbus-to-PROFIBUS gateways ideal for demanding industrial applications.

Warning by Relay Output

A relay output is provided for the power input status. The relay output gives maintenance engineers an additional tool for troubleshooting and maintenance.

Specifications

PROFIBUS Interface

Protocol: PROFIBUS DP-V0 Slave
Number of Ports: 1
Data Rate: 9600 bps to 12 Mbps
Connector: DB9 female
Isolation: 2 kV (built-in)
DIP Switch: For termination
Rotary Switch: PROFIBUS address 0-99 (address 100-125 supported through software configuration)

Modbus Interface

Protocol: Modbus RTU/ASCII Master/Slave
Number of Ports: 1
Serial Standards: RS-232/422/485, software selectable
Connectors: DB9 male
ESD Protection: 15 kV for all signals
RS-485 Data Direction Control: ADDC® (automatic data direction control)
Pull High/Low Resistor for RS-485: 1 kΩ, 150 kΩ
Terminator for RS-485: 120 Ω
Data Bits: 7, 8
Stop Bits: 1, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, DTR/DSR (RS-232 only)
Baudrate: 50 bps to 921.6 kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Configuration Options: Serial Console, Windows Utility
Utility: MGate Manager for Windows 2000, Windows XP, Server 2003, Vista, Server 2008 (x86/x64), Windows Server 2008 R2, Windows 7/8/8.1 (x86/x64), Windows Server 2012 (x64), Windows 2012 R2
Support: QuickLink, Paging

Physical Characteristics

Housing: Metal, IP30
Weight: 500 g (1.10 lb)
Dimensions: 36 x 105 x 140 mm (1.42 x 4.14 x 5.51 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Vibration: IEC 60068-2-6, IEC 60068-2-64
Shock: IEC 60068-2-27
Drop: IEC 60068-2-32

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current:
MGate 4101-MB-PBS: 340 mA @ 12 VDC; 130 mA @ 48 VDC
MGate 4101I-MB-PBS: 375 mA @ 12 VDC; 140 mA @ 48 VDC
Power Connector: Terminal block

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
Hazardous Location: Class 1 Division 2, ATEX, IECEx
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m
IEC 61000-4-8 PFMF

MTBF (mean time between failures)

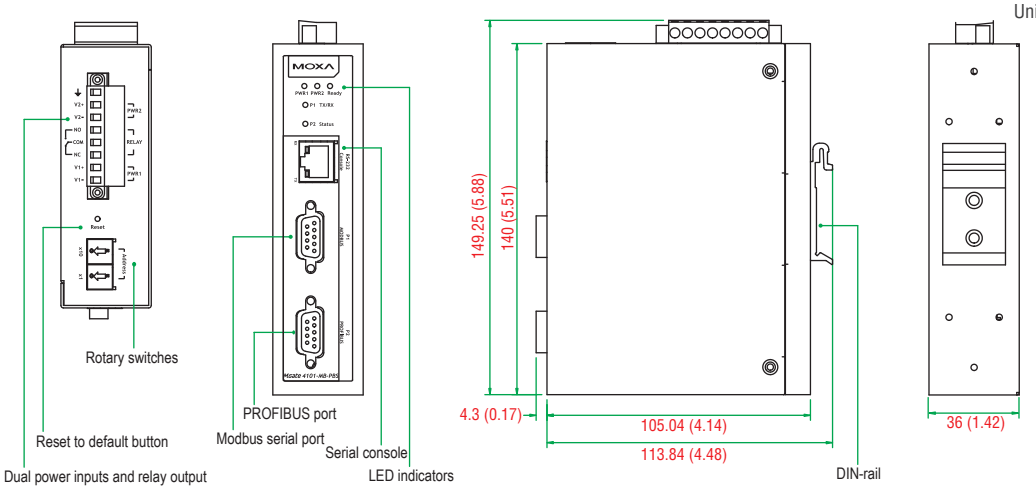
Time: 513,139 hrs
Standard: Telcordia SR332

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Top View | Front View | Side View | Rear View

Ordering Information

Available Models

MGate 4101-MB-PBS: 1-port Modbus-to-PROFIBUS slave gateway, 12-48 VDC, 0 to 60°C operating temperature
MGate 4101I-MB-PBS: 1-port Modbus-to-PROFIBUS slave gateway with 2 kV isolation, 12-48 VDC, 0 to 60°C operating temperature
MGate 4101-MB-PBS-T: 1-port Modbus-to-PROFIBUS slave gateway, 12-48 VDC, -40 to 75°C operating temperature
MGate 4101I-MB-PBS-T: 1-port Modbus-to-PROFIBUS slave gateway with 2 kV isolation, 12-48 VDC, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

WK-36-02: DIN-rail/wall-mounting kit, 2 plates with 6 screws
CBL-F9M9-150: DB9 female to DB9 male serial cable, 150 cm
CBL-F9M9-20: DB9 female to DB9 male serial cable, 20 cm
CBL-RJ45SF9-150: RJ45 to DB9 female shielded serial cable, 150 cm
ADP-RJ458P-DB9F: DB9 female to RJ45 connector
A-ADP-RJ458P-DB9F-ABC01: DB9 female to RJ45 connector
Mini DB9F-to-TB: DB9 female to terminal block connector

One power adapter suitable for your region is included in the product package. Additional power adapters can be purchased separately. Please refer to the Appendix for details.

Package Checklist

- 1 MGate 4101-MB-PBS or 4101I-MB-PBS Modbus-to-PROFIBUS slave gateway
- 1 Serial Cable: CBL-RJ45F9-150
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

MGate™ 5101-PBM-MN Series

1-port PROFIBUS-to-Modbus TCP gateways

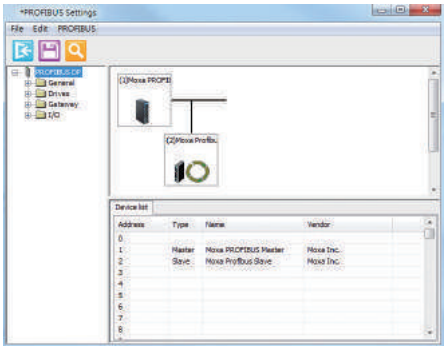
- Protocol conversion between PROFIBUS and Modbus TCP
- Automatic scan of PROFIBUS devices for easy configuration
- Redundant dual DC power inputs and relay output supported
- Embedded data packet analyzer and diagnostic tool
- Web-based GUI for I/O data visualization
- -40 to 75°C wide operating temperature models available

Overview

The MGate 5101-PBM-MN gateway provides a communication portal between PROFIBUS devices (e.g. PROFIBUS drives or instruments) and Modbus TCP hosts. All models are protected with a rugged metallic casing, DIN-rail mountable, and offer optional built-in optical isolation. The PROFIBUS and Ethernet status LED indicators are provided for easy maintenance. The rugged design is suitable for industrial applications such as oil/gas, power, process automation, and factory automation.

Windows Utility for Easy Configuration and Traffic Monitoring

The MGate Manager utility provides a user friendly interface to make configuration and operation as easy as possible. Moxa's innovative AutoScan function can automatically detect all connected PROFIBUS slave devices and their available I/O modules to quickly complete gateway configuration, after which an easy to read data mapping table is created to assist in the configuration of Modbus TCP master (e.g. SCADA, PLC) settings. In addition, users can configure import/export maintenance functions, and use embedded monitoring tools to maintain logs of Modbus communication packets, which can used for troubleshooting.



Various Maintenance Functions

The MGate 5101-PBM-MN provides a Web console and Telnet console for remote maintenance, with both consoles supporting encryption commutation functions such as HTTPS and SSH for preventing unauthorized access. The log functions are provided in firmware such as connection event of Modbus or PROFIBUS for maintenance. Users can monitor each I/O data and review the log through the web console remotely. A relay output alarm is provided for the power input status. It gives maintenance engineers an additional tool for troubleshooting and maintenance.

Redundant Power Inputs

The MGate 5101-PBM-MN has dual power inputs for greater reliability. The power inputs allow simultaneous connections to two live DC power sources to provide uninterrupted operation even if one power source fails. The higher level of reliability makes these advanced PROFIBUS master to Modbus TCP gateways ideal for demanding industrial applications.

Specifications

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, Auto MDI/MDIX
Connector: 8-pin RJ45

Magnetic Isolation Protection: 1.5 kV (built-in)
Modbus TCP:
Operation Modes: Modbus TCP Client/Server

PROFIBUS Interface

Protocol: PROFIBUS DP-V1 Master
Number of Ports: 1
Data Rate: 9600 bps to 12 Mbps
Connector: DB9 female
Isolation: 2 kV (built-in)

Serial Signals (Serial Console)

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Software

Configuration Options: Serial Console, Windows Utility, Web Console (HTTP/HTTPS), Telnet/SSH Console
Utility: MGate Manager for Windows 2000, Windows XP, Server 2003, Vista, Server 2008 (x86/x64), Windows Server 2008 R2, Windows 7/8/8.1 (x86/x64), Windows Server 2012 (x64), Windows 2012 R2
Support: AutoScan, MXview, SNMP (v1, v2, v3), Private MIB

Physical Characteristics

Housing: Metal, IP30
Weight: 500 g (1.10 lb)
Dimensions: 36 x 105 x 140 mm (1.42 x 4.14 x 5.51 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Vibration: IEC 60068-2-6, IEC 60068-2-64
Shock: IEC 60068-2-27
Drop: IEC 60068-2-32

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current: 365 mA @ 12 VDC
Power Connector: Terminal block

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
Hazardous Location: Class 1 Division 2, ATEX, IECEx
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m
IEC 61000-4-8 PFMF

MTBF (mean time between failures)

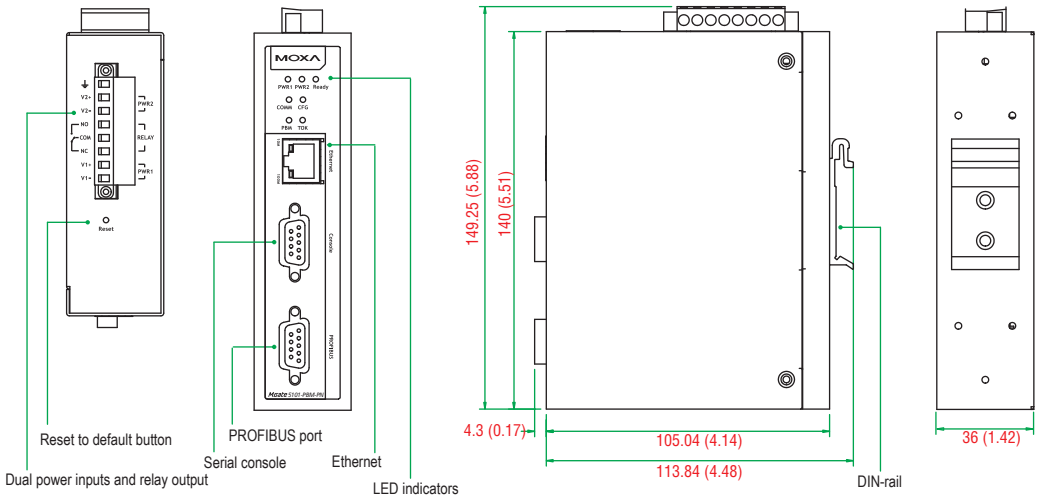
Time: 1,082,881 hrs
Standard: Telcordia SR332

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

MGate 5101-PBM-MN: 1-port PROFIBUS master to Modbus TCP gateway, 12-48 VDC, 0 to 60°C operating temperature
MGate 5101-PBM-MN-T: 1-port PROFIBUS master to Modbus TCP gateway, 12-48 VDC, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

CBL-F9M9-150: DB9 female to DB9 male serial cable, 150 cm
CBL-F9M9-20: DB9 female to DB9 male serial cable, 20 cm
Mini DB9F-to-TB: DB9 female to terminal block connector
One power adapter suitable for your region is included in the product package. Additional power adapters can be purchased separately. Please refer to the Appendix for details.

Package Checklist

- 1 MGate 5101-PBM-MN PROFIBUS master to Modbus TCP gateway
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

MGate™ 5102-PBM-PN Series

1-port PROFIBUS-to-PROFINET gateways

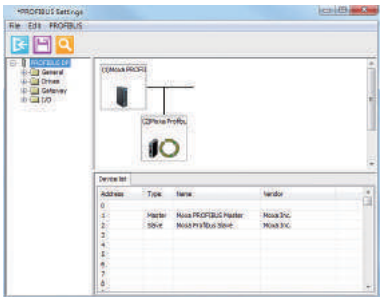
- Protocol conversion between PROFIBUS and PROFINET
- Automatic scan of PROFIBUS devices, and easy configuration
- microSD card for configuration backup
- Built-in Ethernet cascading for easy wiring
- Redundant dual DC power inputs and relay output supported
- Embedded I/O monitoring and diagnostic tools
- Web-based GUI for I/O data visualization
- -40 to 75°C wide operating temperature models available

Overview

The MGate 5102-PBM-PN gateway provides a communication portal between PROFIBUS devices (e.g., PROFIBUS PLC or drive) and the PROFINET host. All models are protected with a rugged metallic casing, are DIN-rail mountable, and offer optional built-in optical isolation. The PROFIBUS and Ethernet status LED indicators are provided for easy maintenance. The rugged design is suitable for industrial applications such as oil & gas, power, process automation, and factory automation.

Easy Setup Tools

Both the Windows MGate Manager utility and web console support the AutoScan function, which makes configuration and operation easy. AutoScan automatically detects all connected PROFIBUS slave devices and their available I/O modules, allowing you to configure your gateways very quickly, and a data mapping table is provided. Furthermore, one click is all that's needed to export all PROFIBUS I/O modules to a GSDML file to assist in the configuration of the PROFINET controller (e.g., a Siemens PLC).



Various Maintenance Functions

The MGate 5102-PBM-PN provides a web console and Telnet console for remote maintenance, with both consoles supporting encryption commutation functions such as HTTPS and SSH to prevent unauthorized access. The status and changes in I/O data of all PROFIBUS slaves can be monitored remotely via the web console, and users can also review the log from the web console to see which system events have occurred. A relay output alarm is provided for the power input and Ethernet cable status. These functions make it easy for maintenance engineers to troubleshoot and maintain devices.

Redundant Power Inputs

The MGate 5102-PBM-PN has dual power inputs for greater reliability. The power inputs allow simultaneous connections to two live DC power sources to provide uninterrupted operation even if one power source fails. The higher level of reliability makes these advanced PROFIBUS master to PROFINET gateways ideal for demanding industrial applications.

Specifications

Ethernet Interface

Protocols: PROFINET RT
Number of Ports: 2 (1 IP, Ethernet cascade)
Speed: 10/100 Mbps, Auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 kV (built-in)

PROFIBUS Interface

Protocol: PROFIBUS DP-V1 Master
Number of Ports: 1
Data Rate: 9600 bps to 12 Mbps
Connector: DB9 female
Isolation: 2 kV (built-in)

Serial Signals (Serial Console)

Connector: 8-pin RJ45
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Software

Configuration Options: Windows Utility, Serial Console, Web Console (HTTP/HTTPS), Telnet/SSH Console
Utility: MGate Manager for Windows 2000, Windows XP, Server 2003, Vista, Server 2008 (x86/x64), Windows Server 2008 R2, Windows 7/8/8.1 (x86/x64), Windows Server 2012 (x64), Windows 2012 R2
Support: AutoScan, MXview, SNMP (v1, v2, v3), Private MIB

Physical Characteristics

Housing: Metal, IP30
Weight: 500 g (1.10 lb)
Dimensions: 36 x 105 x 140 mm (1.42 x 4.14 x 5.51 in)
Storage Card Slot: 1 microSD (SDHC) card slot supports up to 32 GB

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Vibration: IEC 60068-2-6, IEC 60068-2-64
Shock: IEC 60068-2-27
Drop: IEC 60068-2-32

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current: 430 mA @ 12 VDC
Power Connector: Terminal block

Standards and Certifications

Safety: UL 508, EN 60950-1
Hazardous Location: Class 1 Division 2, ATEX, IECEx
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m
IEC 61000-4-8 PFMF

MTBF (mean time between failures)

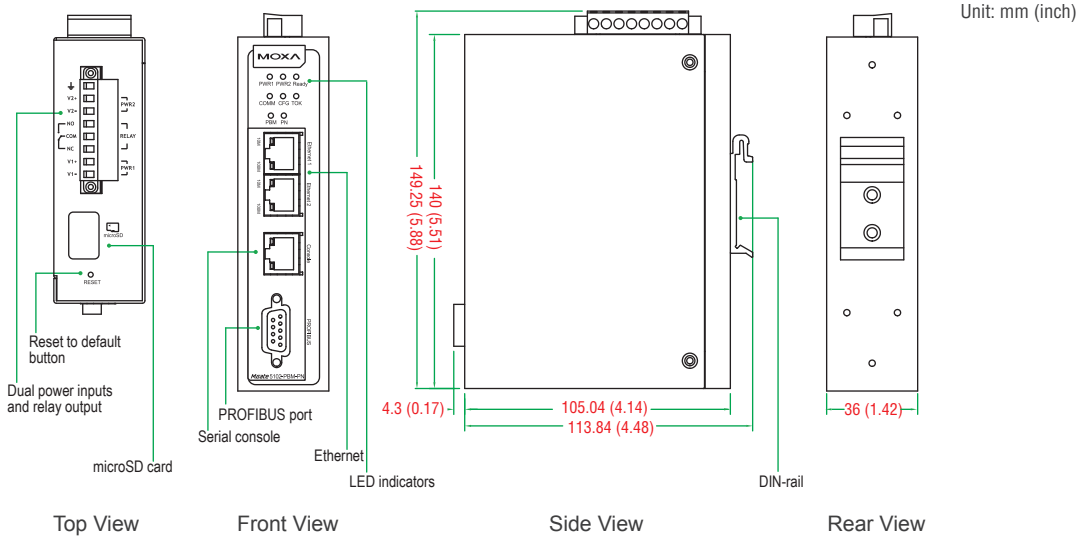
Time: 980,417 hrs
Standard: Telcordia SR332

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

MGate 5102-PBM-PN: 1-port PROFIBUS-to-PROFINET gateway, 12-48 VDC, 0 to 60°C operating temperature
MGate 5102-PBM-PN-T: 1-port PROFIBUS-to-PROFINET gateway, 12-48 VDC, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

CBL-F9M9-150: DB9 female to DB9 male serial cable, 150 cm
CBL-F9M9-20: DB9 female to DB9 male serial cable, 20 cm
CBL-RJ45SF9-150: RJ45 to DB9 female shielded serial cable, 150 cm
ADP-RJ458P-DB9F: DB9 female to RJ45 connector
A-ADP-RJ458P-DB9F-ABC01: DB9 female to RJ45 connector
Mini DB9F-to-TB: DB9 female to terminal block connector

One power adapter suitable for your region is included in the product package. Additional power adapters can be purchased separately. Please refer to the Appendix for details.

Package Checklist

- 1 MGate 5102-PBM-PN PROFIBUS-to-PROFINET gateway
- 1 serial cable: CBL-RJ45F9-150
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

▶ *Award-winning Product*

MGate™ 5105-MB-EIP Series

1-port Modbus RTU/ASCII/TCP-to-EtherNet/IP gateways

- Support for both EtherNet/IP adapter and scanner
- Effortless configuration via web or Windows utility
- Complete packet analysis and diagnosis information for maintenance
- Easy I/O data maintenance via web interface
- microSD card for configuration and system log backup
- -40 to 75°C wide operating temperature models available
- Modbus port with 2 kV built-in isolation protection
- Built-in Ethernet cascading for easy wiring

Overview

The MGate 5105-MB-EIP is an industrial Ethernet gateway for Modbus RTU/ASCII/TCP and EtherNet/IP network communications. To integrate existing Modbus devices onto an EtherNet/IP network, use the MGate 5105-MB-EIP as a Modbus master or slave to collect data and exchange data with EtherNet/IP devices. The latest exchange data will be stored in the gateway as well. The gateway converts stored Modbus data into EtherNet/IP packets so the EtherNet/IP scanner can control or monitor Modbus devices.

Configuration Backup via microSD Card

The MGate 5105-MB-EIP is equipped with a microSD card slot. A microSD card can be used to back up both the system configuration and system log, and can be used to conveniently copy the same configuration to several MGate 5105-MP-EIP units. The configuration file stored in the microSD card will be copied to the MGate itself when the system is rebooted.

Effortless Configuration and Troubleshooting via Web Console

The MGate 5105-MB-EIP also provides a web console to make configuration easy without having to install an extra utility. Simply log in as an administrator to access all settings, or as a general user with read-only permission. Besides configuring basic protocol settings, you can use the web console to monitor I/O data values and transfers. In particular, I/O Data Mapping shows data addresses for both protocols in the gateway's memory and I/O Data View allows you to track data values for online nodes. Moreover, diagnostics and communication analysis for each protocol can also provide helpful information for troubleshooting.

Redundant Power Inputs

The MGate 5105-MB-EIP has dual power inputs for greater reliability. The power inputs allow simultaneous connections to two live DC power sources, so that continuous operation is provided even if one power source fails. The higher level of reliability makes these advanced Modbus-to-EtherNet/IP gateways ideal for demanding industrial applications.

Specifications

Ethernet Interface

Protocols: EtherNet/IP, Modbus TCP
Number of Ports: 2 (1 IP, Ethernet cascade)
Speed: 10/100 Mbps, Auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 kV (built-in)
EtherNet/IP:
- Class: Adapter, Scanner
- CIP Objects Supported: Identity, Message Router, Assembly, Connection Manager, TCP/IP interface, Ethernet link, Port
- Max. Number of Connections:
  > MGate as Adapter: 16 connections for read-only, 1 connection for read/write
  > MGate as Scanner: 100 connections
- Max. Total I/O Data Size:
  Input: 2048 bytes (496 bytes per connection)
  Output: 2048 bytes (496 bytes per connection)

Modbus TCP:
- Mode: Client/Server
- Functions Supported: 1, 2, 3, 4, 5, 6, 15, 16, 23
- Max. Number of Commands: 100
- Max. Number of Connections:
  MGate as Modbus TCP Master: 32 connections
  MGate as Modbus TCP Slave: 16 connections
- Max. Total I/O Data Size:
  Input: 2048 bytes
  Output: 2048 bytes

Serial Interface

Protocol: Modbus RTU/ASCII Master/Slave
Number of Ports: 1

Serial Standards: RS-232/422/485, software selectable
Connectors: DB9 male
RS-485 Data Direction Control: ADDC® (automatic data direction control)
Pull High/Low Resistor for RS-485: 1 kΩ, 150 kΩ
Terminator for RS-485: 120 Ω
Isolation: 2 kV (built-in)

Serial Communication Parameters

Data Bits: 7, 8
Stop Bits: 1, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, RTS Toggle (RS-232 only)
Baudrate: 50 bps to 921.6 kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Configuration Options: Web Console, Windows Utility, Serial Console
Utility: MGate Manager for Windows 2000, Windows XP, Server 2003, Vista, Server 2008 (x86/x64), Windows Server 2008 R2, Windows 7/8/8.1 (x86/x64), Windows Server 2012 (x64), Windows 2012 R2
Support: MXview, SNMP (v1, v2, v3), Private MIB

Physical Characteristics

Housing: Metal, IP30
Weight: 507 g (1.12 lb)
Dimensions: 36 x 105 x 140 mm (1.42 x 4.14 x 5.51 in)
Storage Card Slot: 1 microSD (SDHC) card slot supports up to 32 GB

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Vibration: IEC 60068-2-6, IEC 60068-2-64
Shock: IEC 60068-2-27
Drop: IEC 60068-2-32

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current: 455 mA @ 12 VDC; 125 mA @ 48 VDC
Power Connector: Terminal block

Standards and Certifications

Safety: UL 508, EN 60950-1
Hazardous Location: Class 1 Division 2, ATEX, IECEx
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m
IEC 61000-4-8 PFMF

MTBF (mean time between failures)

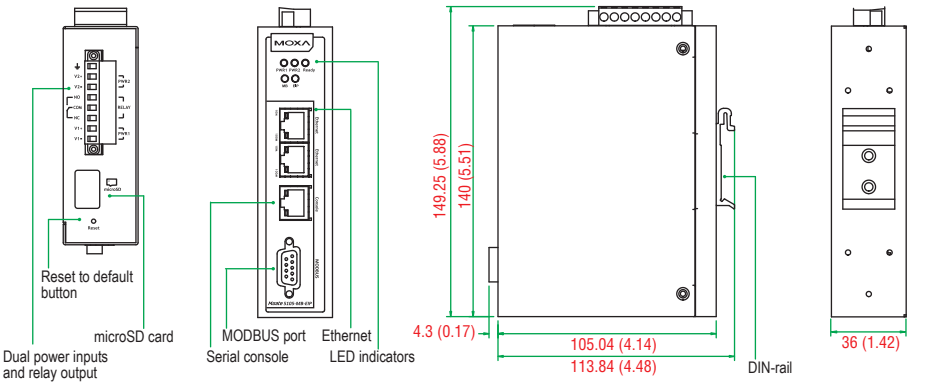
Time: 859,422 hrs
Standard: Telcordia SR332

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Top View | Front View | Side View | Rear View

Ordering Information

Available Models

MGate 5105-MB-EIP: 1-port Modbus-to-EtherNet/IP gateway, 0 to 60°C operating temperature
MGate 5105-MB-EIP-T: 1-port Modbus-to-EtherNet/IP gateway, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

CBL-F9M9-150: DB9 female to DB9 male serial cable, 150 cm
CBL-F9M9-20: DB9 female to DB9 male serial cable, 20 cm
CBL-RJ45SF9-150: RJ45 to DB9 female serial shielded cable, 150 cm
ADP-RJ458P-DB9F: DB9 female to RJ45 connector
A-ADP-RJ458P-DB9F-ABC01: DB9 female to RJ45 connector
Mini DB9F-to-TB: DB9 female to terminal block connector

One power adapter suitable for your region is included in the product package. Additional power adapters can be purchased separately. Please refer to the Appendix for details.

Package Checklist

- 1 MGate 5105-MB-EIP Modbus-to-EtherNet/IP gateway
- 1 serial cable: DBL-RJ45F9-150
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

MGate™ EIP3000 Series

1 and 2-port EtherNet/IP-to-DF1 gateways

- PCCC objects for Rockwell Automation networks supported
- Use ProCOM to implement control via COM port mapping
- 8 simultaneous EtherNet/IP client/server pairs with up to 16 queued requests
- Serial redirector keeps the original serial master and slave connection while connecting devices to the Ethernet
- EtherNet/IP and DF1 protocol analyzer for easy troubleshooting
- Redundant dual DC power inputs
- Built-in Ethernet cascading for easy wiring
- -40 to 75°C wide operating temperature models available

ProCOM

IEC IECEx Ex c UL us LISTED CE FC

Overview

MGate™ EIP3000 gateways provide EtherNet/IP to DF1 protocol conversion for users who need to connect Allen Bradley PLCs to an EtherNet/IP network. With a number of innovative functions, the MGate™ series overcomes the difficulties of connecting between legacy serial devices and SCADA software. Both 1 and 2-port gateways are available for use with different sized control networks.

Protocol Conversion between DF1 and EtherNet/IP

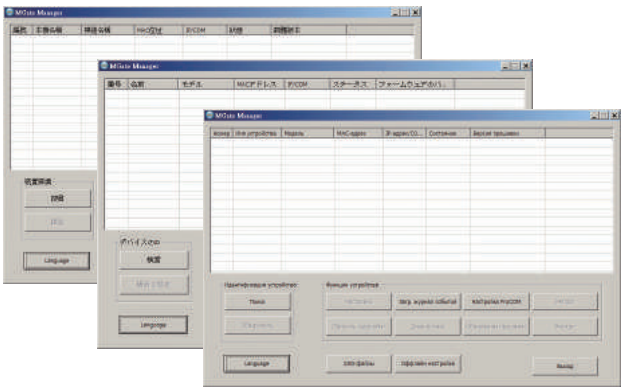
By supporting PCCC objects on CIP, the MGate™ EIP3000 can communicate seamlessly with SCADA software such as RSLinx. For users who develop control software based on EtherNet/IP, MGate EIP3000 offers the standard interface for connection.

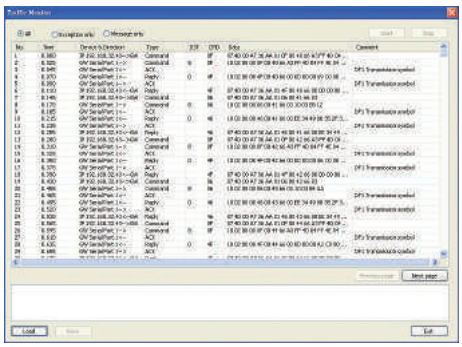
Support for Multiple EtherNet/IP Connections

MGate™ EIP3000 gateways support up to 16 EtherNet/IP clients and servers simultaneously. Each client can send up to 16 requests at a time, and the multiple connection capability can help establish redundancy for more complex control systems.

Windows Utility for Easy Setup and Traffic Monitoring

Moxa provides a user-friendly Windows utility with multi-language support. The utility supports a traffic monitoring function for EtherNet/IP and DF1 protocols, and not only logs events initiated by the gateway, but also records all commands and responses that pass through the gateway. The utility helps users determine the root cause of failures and performance bottlenecks.





Serial Redirector Function Maintains Original Master/Slave Connections

The serial redirector function allows the commands of a serial master (command initiator) to be redirected to the serial slave (command executor) on another port. In addition, a serial master can operate simultaneously with EtherNet/IP masters without changing the DF1 architecture or software. With the serial redirector function, MGate™ EIP3000 gateways can establish redundant control of legacy slave devices that were originally designed to be controlled by a single serial master.

ProCOM Implements Control via COM Port Mapping

Each MGate™ EIP3000 gateway supports virtual serial ports for the remote PC. You can connect to the MGate™ EIP3000 through the COM port by using Moxa's Real COM driver, with the actual physical connection over the Ethernet. The gateway supports up to 4 virtual COM port connections and offers greater flexibility when designing redundant control systems.

Pull high/low Resistors and Terminator Selection

When using termination resistors to prevent serial signal reflection, it is important to set the pull high/low resistors correctly so that the electrical signal is not corrupted. Since no set of resistor values is universally compatible with all environments, the EIP3000 has DIP switches on the bottom panel for setting the termination and pull high/low resistor values.

Built-in Isolation

Complex device networks that incorporate high amperage devices could be subject to electrical signal distortion from electrical discharges, magnetic noise, or common mode transients. MGate™ series products solve this problem by using built-in optical isolation.

Specifications

Ethernet Interface

Protocols: CIP (PCCC) on EtherNet/IP
Number of Ports: 2 (1 IP, supports Ethernet cascading)
Speed: 10/100 Mbps, Auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 kV (built-in)

Serial Interface

Protocol: DF1 Full-duplex
Number of Ports:
EIP3170/3170I: 1
EIP3270/3270I: 2
Serial Standards: RS-232/422, software selectable
Connectors:
EIP3170/3170I: DB9 male for RS-232, terminal block for RS-422
EIP3270/3270I: DB9 male x 2
ESD Protection: 15 kV for all signals

Serial Communication Parameters

Data Bits: 8
Stop Bits: 1, 2
Parity: None, Even, Odd
Flow Control: RTS/CTS, DTR/DSR (RS-232 only)
Baudrate: 1200 bps to 921.6 kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND

Software

Configuration Options: Serial Console, Telnet Console, Windows Utility
Utility: MGate Manager for Windows 2000, Windows XP, Server 2003, Vista, Server 2008 (x86/x64), Windows Server 2008 R2, Windows 7/8/8.1 (x86/x64), Windows Server 2012 (x64), Windows 2012 R2
Support: Smart Routing, Serial Redirection, ProCOM, MXview, SNMP v1 (read only)

Physical Characteristics

Housing: Plastic, IP30
Weight:
MGate EIP3170: 360 g (0.79 lb)
MGate EIP3270: 380 g (0.84 lb)
Dimensions:
Without ears: 29 x 89.2 x 118.5 mm (1.14 x 3.51 x 4.67 in)
With ears extended: 29 x 89.2 x 124.5 mm (1.14 x 3.51 x 4.90 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Vibration: IEC 60068-2-6, IEC 60068-2-64
Shock: IEC 60068-2-27
Drop: IEC 60068-2-32

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current:
MGate EIP3170: 435 mA @ 12 VDC
MGate EIP3170I: 555 mA @ 12 VDC
MGate EIP3270: 435 mA @ 12 VDC
MGate EIP3270I: 510 mA @ 12 VDC
Power Connector: Terminal block

Standards and Certifications

Safety: UL 508, EN 60950-1
Hazardous Location: Class 1 Division 2, ATEX, IECEx
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 4 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11

MTBF (mean time between failures)

Time:
MGate EIP3170: 210,794 hrs
MGate EIP3270: 125,234 hrs
Standard: Telcordia SR332

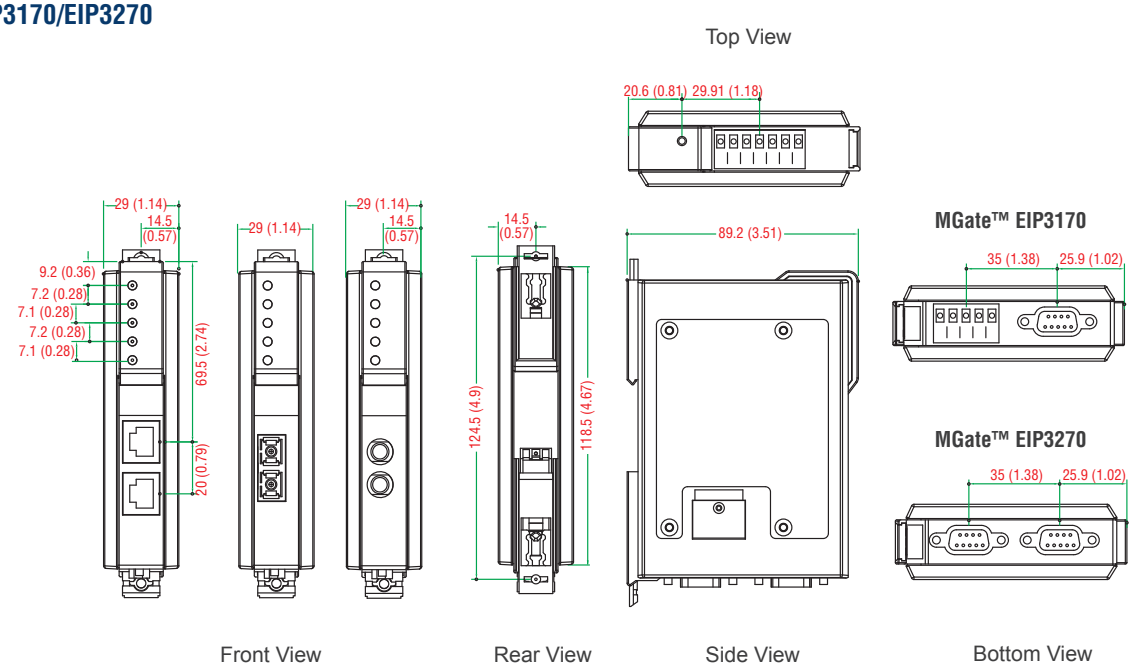
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

EIP3170/EIP3270



Ordering Information

Available Models

MGate EIP3170: 1-port EtherNet/IP-to-DF1 gateway, 0 to 60°C operating temperature
MGate EIP3170I: 1-port EtherNet/IP-to-DF1 gateway with 2 kV isolation, 0 to 60°C operating temperature
MGate EIP3270: 2-port EtherNet/IP-to-DF1 gateway, 0 to 60°C operating temperature
MGate EIP3270I: 2-port EtherNet/IP-to-DF1 gateway with 2 kV isolation, 0 to 60°C operating temperature
MGate EIP3170-T: 1-port EtherNet/IP-to-DF1 gateway, -40 to 75°C operating temperature
MGate EIP3170I-T: 1-port EtherNet/IP-to-DF1 gateway with 2 kV isolation, -40 to 75°C operating temperature
MGate EIP3270-T: 2-port EtherNet/IP-to-DF1 gateway, -40 to 75°C operating temperature

Package Checklist

- 1 MGate EIP3170 or EIP3170I or EIP3270 or EIP3270I EtherNet/IP gateway
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

Mini DB9F-to-TB: DB9 female to terminal block connector

One power adapter suitable for your region is included in the product package. Additional power adapters can be purchased separately. Please refer to the Appendix for details.

MGate™ W5108/W5208 Series

Preliminary

1 and 2-port IEEE 802.11a/b/g/n wireless Modbus/DNP3 gateways

*Available in March, 2016

- Retrieve Modbus/DNP3 serial data through an 802.11 network
- Supports serial tunneling communications
- Slave mode supports 16 TCP masters and up to 31 or 62 serial slaves at the same time
- Embedded Modbus traffic monitor
- Dual DC power inputs for redundancy and relay output supported
- Secure data access with WEP/WPA/WPA2
- 2 kV serial port isolation
- microSD card for configuration backup
- -40 to 75°C wide operating temperature models available
- Supports 2 digital inputs and 2 digital outputs

Overview

The MGate W5108/W5208 series gateways are an ideal choice for connecting Modbus serial devices to a wireless LAN, or DNP3 serial to DNP3 IP through a wireless LAN. With IEEE 802.11a/b/g/n support, you can use fewer cables in difficult wiring environments, and for secure data transmission, the MGate W5108/W5208 series gateways support WEP/WPA/WPA2. The gateways' rugged design makes them suitable for industrial applications, including oil & gas, power, process automation, and factory automation.

Modbus Traffic Monitor

The MGate W5108/W5208 series gateways support Modbus Protocol Traffic Monitor for easy troubleshooting, especially during the installation stage. Communication issues could be caused by incorrect software parameters, such as slave ID and register address, or incorrect hardware parameters such as baudrate and interface. With Modbus Protocol Traffic Monitor support, you can check the captured data and easily identify the root cause.

Variety Maintenance Functions

The MGate W5108/W5208 series gateways support a web console and Telnet console for remote maintenance. Each gateway also supports encryption commutation functions such as HTTPS and SSH to prevent security issues. In addition, log functions are provided in the firmware to record connection events and Modbus for maintenance events. Users can review log data remotely through the web console.

Specifications

Ethernet Interface

Protocols: Modbus TCP, DNP3, TCP Client/Server modes supported
Number of Ports: 1
Speed: 10/100 Mbps, Auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 kV (built-in)

Serial Interface

Protocols: Modbus RTU/ASCII Master/Slave, DNP3
Number of Ports:
MGate W5108: 1
MGate W5208: 2
Serial Standards: RS-232/422/485, software selectable
Connectors: DB9 male
Pull High/Low Resistor for RS-485: 1 kΩ, 150 kΩ
Terminator for RS-485: 120 Ω
Isolation: 2 kV (built-in)

Serial Communication Parameters

Data Bits: 7, 8
Stop Bits: 1, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, RTS Toggle
Baudrate: 50 bps to 921.6 kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Wireless Network

Standards Compliance: 802.11a/b/g/n
Network Modes: Infrastructure, Ad-Hoc
Transmission Rate:
802.11a/g: 65, 54, 48, 36, 24, 18, 12, 9, 6 Mbps, auto rate
802.11b: 11, 5.5, 2, 1 Mbps, auto rate
802.11n 2.4 GHz: HT20, MCS 0-7
802.11n 5 GHz: HT20 & HT40 MCS 0-7
Transmission Distance: Up to 100 meters (in open areas)
Antenna Connector: Reverse SMA
TX Transmit Power (per antenna port):
2.4 GHz
- 802.11b:
  1 to 11 Mbps, Typ. 16 (±1.5 dBm)
- 802.11g:
  6 to 36 Mbps, Typ.16 (±1.5 dBm)
  48 Mbps, Typ. 15 (±1.5 dBm)
  54 Mbps, Typ. 14 (±1.5 dBm)
- 802.11n (20 MHz):
  MCS0-3: Typ. 16 dBm (± 1.5 dBm)
  MCS4-5: Typ. 14 dBm (± 1.5 dBm)
  MCS6-7: Typ. 12 dBm (± 1.5 dBm)

5 GHz
- 802.11a:
  6 to 36 Mbps, Typ.15 (±1.5 dBm)
  48 Mbps, Typ. 15 (±1.5 dBm)
  54 Mbps, Typ. 14 (±1.5 dBm)
- 802.11n (20/40 MHz):
  MCS0-3: Typ. 15 dBm (± 1.5 dBm)
  MCS4-5: Typ. 14 dBm (± 1.5 dBm)
  MCS6-7: Typ. 12 dBm (± 1.5 dBm)

RX Sensitivity:
2.4 GHz
- 802.11b:
  -92 dBm @ 1 Mbps,
  -88 dBm @ 2 Mbps,
  -87 dBm @ 5.5 Mbps,
  -84 dBm @ 11 Mbps
- 802.11g:
  -91 dBm @ 6 Mbps,
  -90 dBm @ 9 Mbps,
  -88 dBm @ 12 Mbps,
  -86 dBm @ 18 Mbps,
  -80 dBm @ 24 Mbps,
  -80 dBm @ 36 Mbps,
  -74 dBm @ 48 Mbps,
  -73 dBm @ 54 Mbps
- 802.11n(20MHz):
  -89 dBm @ MCS0
  -87 dBm @ MCS1
  -85 dBm @ MCS2
  -81 dBm @ MCS3
  -78 dBm @ MCS4
  -74 dBm @ MCS5
  -73 dBm @ MCS6
  -71 dBm @ MCS7

5 GHz
- 802.11a:
  -91 dBm @ 6 Mbps,
  -90 dBm @ 9 Mbps,
  -88 dBm @ 12 Mbps,
  -86 dBm @ 18 Mbps,
  -82 dBm @ 24 Mbps,
  -81 dBm @ 36 Mbps,
  -75 dBm @ 48 Mbps,
  -74 dBm @ 54 Mbps
- 802.11n (20MHz):
  -89 dBm @ MCS0
  -87 dBm @ MCS1
  -85 dBm @ MCS2
  -81 dBm @ MCS3
  -78 dBm @ MCS4
  -74 dBm @ MCS5
  -73 dBm @ MCS6
  -71 dBm @ MCS7
- 802.11n (40MHz):
  -85 dBm @ MCS0
  -84 dBm @ MCS1
  -81 dBm @ MCS2
  -77 dBm @ MCS3
  -75 dBm @ MCS4
  -70 dBm @ MCS5
  -69 dBm @ MCS6
  -67 dBm @ MCS7

Spread Spectrum and Modulation (Typical):
OFDM (54, 48, 36, 24, 18, 12, 9, 6 Mbps)
OFDM (MCS0, MCS1, MCS2, MCS3 MCS4, MCS5, MCS6, MCS7)
CCK (11 Mbps, 5.5 Mbps)
DQPSK (2 Mbps)
DBPSK (1 Mbps)
Operating Channels (Central frequency):
- US:
  2.412 to 2.462 GHz (11 channels)
  5.180 to 5.240 (4 channels)
  5.260 to 5.320 (4 channels)
  5.500 to 5.700 GHz (8 channels, excludes 5.600 to 5.640 GHz)
  5.745 to 5.825 GHz (5 channels)
- EU:
  2.412 to 2.472 GHz (13 channels)
  5.180 to 5.240 (4 channels)
  5.260 to 5.320 (4 channels)
  5.500 to 5.700 GHz (11 channels)
- JP:
  2.412 to 2.484 GHz (14 channels, DSSS)
  5.180 to 5.240 (4 channels)
  5.260 to 5.320 (4 channels)
  5.500 to 5.700 GHz (11 channels)

Digital Input/Output

Number of DIOs: 2 DIs and 2 DOs
Connectors: 6-pin terminal blocks
Dry Contact Level:
Logic “0”: Short to GND
Logic “1”: Open
Wet Contact Level:
Logic “0”: +3 VDC max.
Logic “1”: +10 to 30 V (COM to DI)
Digital Output (Sink Type):
Driver Current: Max. 200 mA per channel
On-state voltage: 24 VDC nominal, open collector to 30 V
Storage Card Slot: 1 microSD (SDHC) card slot supports up to 32 GB

Software

Configuration Options: Web console, Serial console, Telnet console
Utility: Device Search Utility (DSU) for Windows 95, 98, ME, NT, 2000, Windows XP, Server 2003, Vista, Server 2008 (x86/x64), Windows Server 2008 R2, Windows 7/8/8.1 (x86/x64), Windows Server 2012 (x64), Windows 2012 R2
Network Protocols: TCP/IP, UDP, HTTP, SMTP, NTP, DNS, DHCP Client, SNMP (v1, v2, v3), Private MIB, ARP, Telnet

Security

Authentication: WEP encryption (64 or 128 bit), WPA / WPA2-Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP and AES)
Encryption: 128-bit TKIP/AES-CCMP EAP-TLS, PEAP/GTC, PEAP/MD5, PEAP/MSCHAPV2, EAP-TTLS/PAP, EAP-TTLS/CHAP, EAP-TTLS/MSCHAP, EAP-TTLS/MSCHAPV2, EAP-TTLS/EAP-MSCHAPV2, EAP-TTLS/EAP-GTC, EAP-TTLS/EAP-MD5, LEAP

Physical Characteristics

Housing: Metal, IP30
Weight:
MGate W5108: 589 g (1.30 lb)
MGate W5208: 738 g (1.63 lb)
Dimensions:
MGate W5108: 45.8 x 105 x 134 mm (1.8 x 4.13 x 5.28 in)
MGate W5208: 59.6 x 101.7 x 134 mm (2.35 x 4 x 5.28 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Vibration: IEC 60068-2-6, IEC 60068-2-64
Shock: IEC 60068-2-27
Drop: IEC 60068-2-32

Power Requirements

Input Voltage: 9 to 60 VDC
Input Current: 495 mA @ 9 VDC; 202 mA @ 24 VDC; 114 mA @ 48 VDC; 99 mA @ 60 VDC
Power Connector: Terminal block

Standards and Certifications

Safety: UL 508, EN 60950-1
Hazardous Location: UL/cUL, Class 1 Division 2, ATEX Zone 2, IECEx*
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m
IEC 61000-4-8 PFMF
Radio:
EN 300328, EN 301893, TELECOM
CE (ETSI EN 301 893, ETSI EN 300 328), ARIB RCR STD-33, ARIB STD-66
*Certification process is underway. Please contact a Moxa sales representative for details.

Reliability

Alarm Functions: SMS, relay, e-mail
Alert Tools: Built-in buzzer
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)

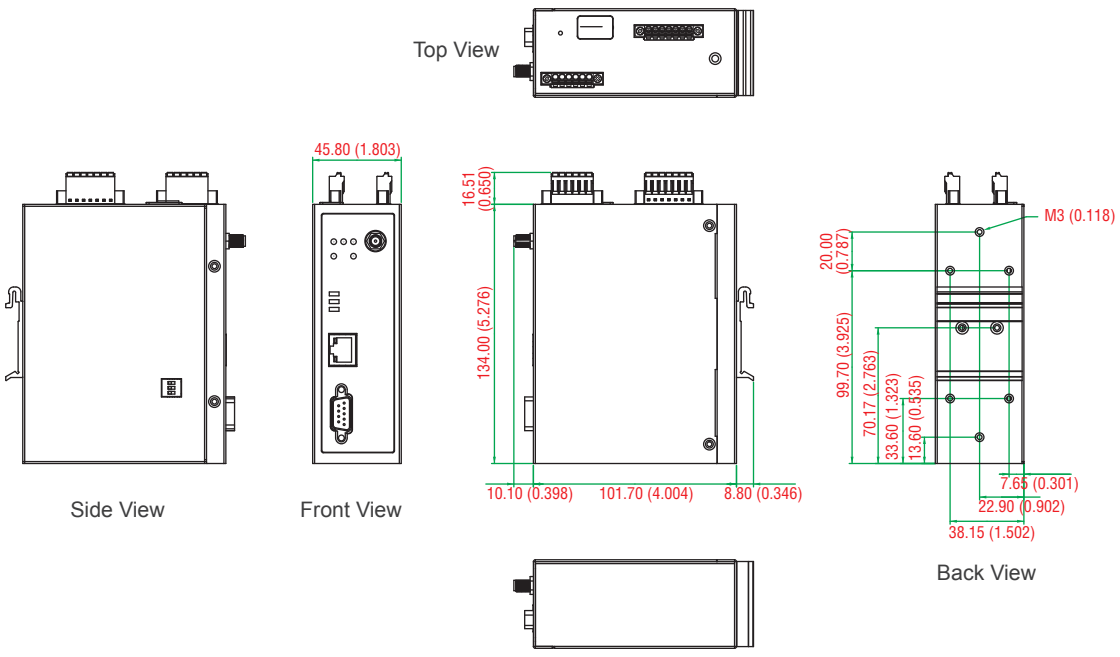
Time:
MGate W5108: 668,518 hrs
MGate W5208: 556,271 hrs
Standard: Telcordia SR332

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

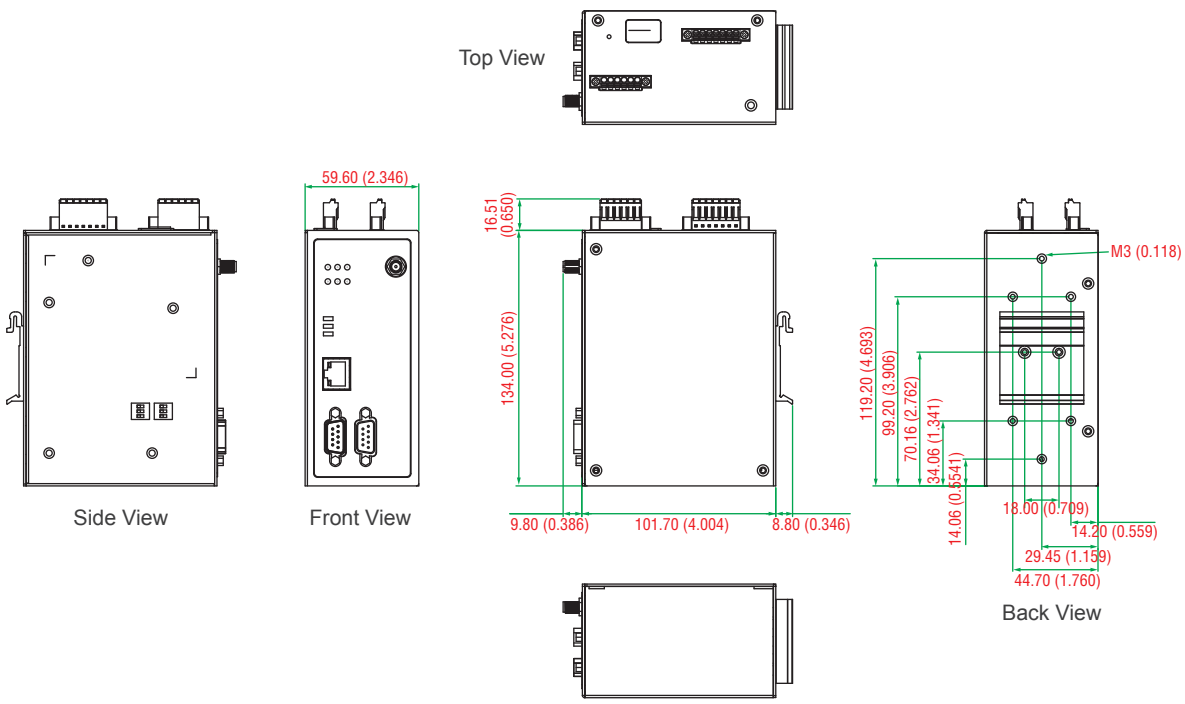
Dimensions (MGate W5108)

Unit: mm (inch)



Dimensions (MGate W5208)

Unit: mm (inch)



Ordering Information

Available Models

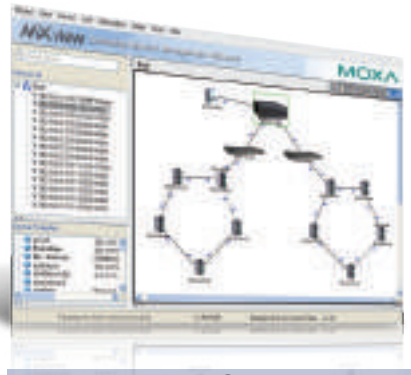
MGate W5108: 1-port Modbus/DNP3 gateway with 802.11 a/b/g/n WLAN (includes US/Euro/Japan bands), 0 to 60°C operating temperature
MGate W5108-T: 1-port Modbus/DNP3 gateway with 802.11 a/b/g/n WLAN (includes US/Euro/Japan bands), -40 to 75°C operating temperature
MGate W5208: 2-port Modbus gateway/DNP3 with 802.11 a/b/g/n WLAN (includes US/Euro/Japan bands), 0 to 60°C operating temperature
MGate W5208-T: 2-port Modbus gateway/DNP3 with 802.11 a/b/g/n WLAN (includes US/Euro/Japan bands), -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

Mini DB9F-to-TB: DB9 female to terminal block connector
One power adapter suitable for your region is included in the product package. Additional power adapters can be purchased separately. Please refer to the Appendix for details.

Package Checklist

- 1 MGate W5108 or MGate W5208 WiFi gateway
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card



Industrial Network Security and Management

Industrial Network Security and Routers

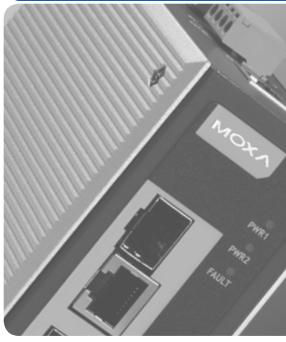
Introduction: Industrial network security and routers 5-2
EDR-G902/G903 Series: Industrial secure routers with firewall/NAT/VPN 5-4
EDR-810 Series: 8+2G multiport industrial secure router with switch/firewall/NAT/VPN 5-7

Industrial Network Management

Introduction: Industrial network management 5-10
MXstudio: Industrial network management suite 5-11
MXconfig: Industrial network configuration tool 5-12
MXview: Industrial network management software 5-14

5

Industrial Network Security and Management



Introduction to Industrial Network Security and Routers

The convergence of IT and industrial automation networks has created tremendous opportunities, but it has also introduced concerns related to network security.

Security threats to industrial networks can originate either internally or externally and, if realized, cause significant damage to remote automation systems, compromise staff safety, and lead to production losses. EDR series routers use a Virtual Private Network (VPN) over a public network to provide secure remote access to field devices, and they use a firewall to protect mission-critical infrastructures and assets.

The increasing complexity of industrial networks requires the segmentation of the network into different function zones. EDR series routers can also be used as Layer 3 routers for packet routing between WANs and multiple LANs.

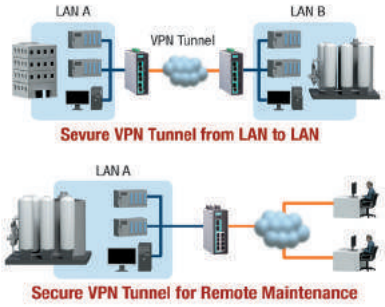
With the convergence of IT and industrial automation networks, data, voice, and even video are now being transmitted over the same medium; therefore, requiring high-bandwidth connections to prevent network congestion. The EDR series provides nonstop communications for industrial automation networks with gigabit bandwidth, making industrial control systems more reliable but at a lower total cost of ownership.

Enable Secure Industrial Automation Networks

VPN for Secure Remote Access

The EDR series' IPSec (Client/Server) and L2TP (Server) functions create secure, encrypted tunnels for secure remote access between industrial networks and remote locations, such as in water and wastewater, oil and gas, power, or intelligent transportation system networks.

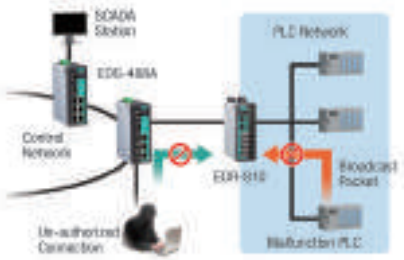
IPSec provides a secure tunnel between different LANs, such as a headquarters and remote sites, and an L2TP server provides secure communications between a roaming user and critical devices on the automation network.



Firewalls for Critical Infrastructure Protection

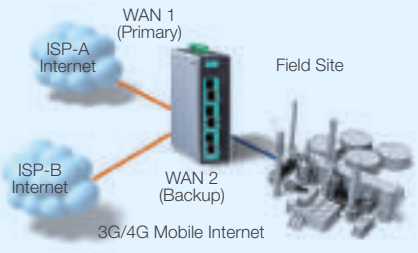
The EDR series provides firewall protection for critical network devices such as PLCs, RTUs, and DCSs, thereby enabling network isolation to avoid communications interruptions between devices.

The high-performance firewall prevents unauthorized connections from connecting to critical devices without compromising the network performance of legitimate traffic. In addition, the EDR series can protect and isolate the network when broadcast storm packets accumulate from a malfunctioning device.

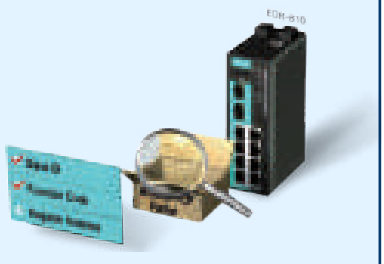


Tailored Design for Industrial Applications

Wizard for configurable WAN/LAN interfaces on ports



Dual WANs for redundancy



Built-in PacketGuard™ for Modbus TCP packet inspection

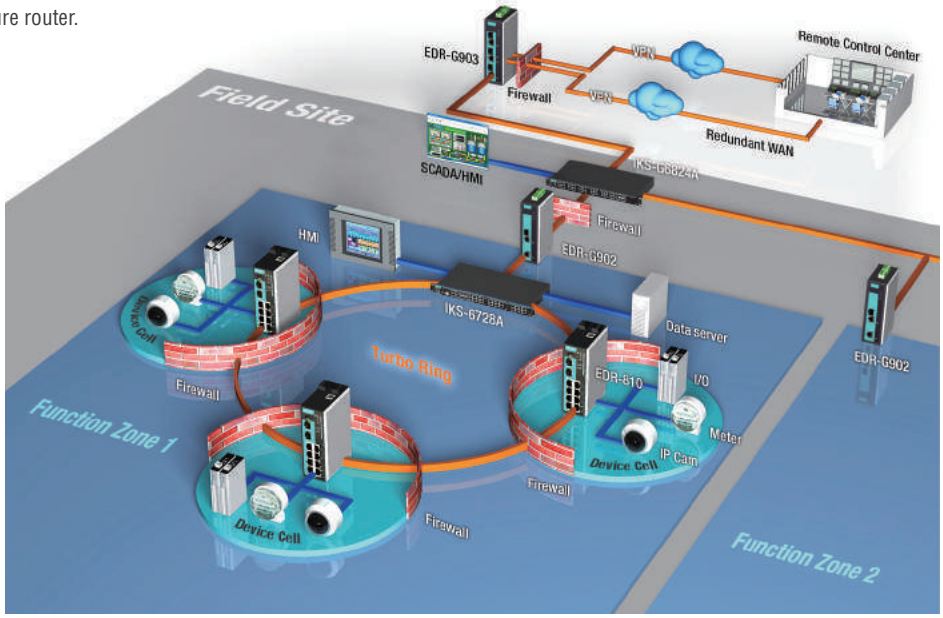
Layered Defense-in-Depth Cybersecurity for Automation

Recognizing the unique security challenges facing ICS networks, the American National Standards Institute (ANSI) and the International Society of Automation (ISA) have promulgated the ANSI/ISA-99 (IEC 62443) standards, which describe best practices for ICS security. Central to the IEC 62443 standard is the "zone and conduit" security model, which is implemented with a defense-in-depth strategy.

In the security model suggested by the IEC 62443 standard, ICS devices are segmented into independent zones composed of interconnected devices that work closely together to achieve a specific function. While communications within a zone are less restricted, different zones are required to communicate with each other through a single point called a conduit, which is usually protected by a secure router or firewall. The conduits are robustly protected to only allow the specific data that is needed to coordinate the functions of the different zones. Any communications that are irrelevant to the function of a certain zone, such as http traffic to a Modbus TCP zone, will be blocked by the secure router.

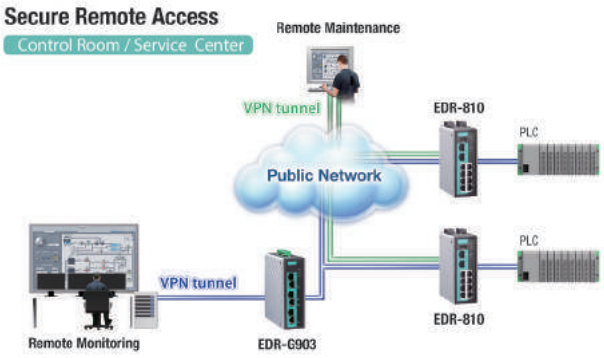
Moxa's portfolio of cybersecurity solutions includes: the EDR-G903, a high-performance secure router; the EDR-G902, a highly cost-effective secure router; and the EDR-810, an integrated router/switch solution. This complete portfolio allows you to deploy optimized cybersecurity coverage anywhere on the automation network at different locations such as:

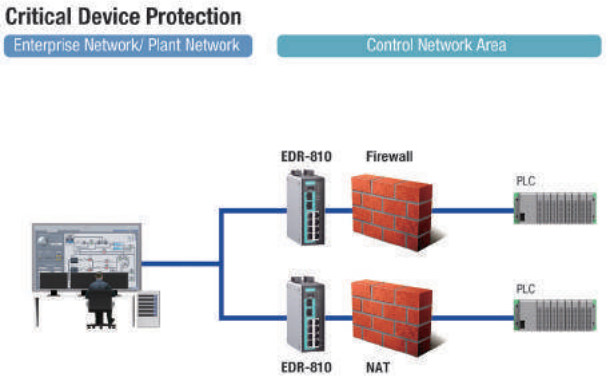
- **Factory Site:** Protecting the entire local site and securing remote data transmissions from the control centers.
- **Function Zone:** Protecting data transmissions from multiple device cells and critical devices.
- **Device Cell:** Protecting the data collected from multiple field devices, such as I/Os, meters, or IP cameras.



Secure Remote Access and Critical Device Protection

As an all-in-one firewall/NAT/VPN/router, the EDR series creates encrypted VPN tunnels between control rooms and remote sites. In addition, the built-in firewall/NAT functions prevent unauthorized access or broadcast storms, caused by malfunctioning devices, from damaging critical network devices, such as PLCs and DCS.





EDR-G902/G903 Series

Award-winning Product
TAIWAN EXCELLENCE 2011

Industrial secure routers with firewall/NAT/VPN

- Firewall/NAT/VPN/Router all-in-one
- Secure remote access tunnel with VPN
- Protect critical assets with stateful firewall
- Inspect industrial protocol with PacketGuard technology
- Easy network setup with address translation (NAT)
- Dual WAN redundant interfaces through public networks
- Support for VLANs in different interfaces
- -40 to 75°C operating temperature range (T model)
- ISA99 / IEC 62443 / NERC CIP compliance

(EDR-G903) (EDR-G902)

Introduction

The EDR-G903/G902 series is a high-performance, industrial VPN server with a firewall/NAT all-in-one secure router. It is designed for Ethernet-based security applications in sensitive remote control or monitoring networks, and it provides an Electronic Security Perimeter for the protection of critical cyber assets such as pumping stations, DCS, PLC systems on oil rigs, and water treatment systems. The EDR-G902/G903 series includes the following cybersecurity features:

- Virtual Private Network (VPN): VPNs are designed to provide users with secure communication links when accessing a private network from the public Internet. They use IPSec (IP Security) server or client mode for encryption and authentication of all IP packets at the network layer to ensure confidentiality and sender authentication.
- Firewall: Controls network traffic between different trust zones. Network Address Translation (NAT), which shields the internal LAN from unauthorized activity from outside hosts, is included.

The EDR-G902/G903's Quick Automation Profile function supports most common fieldbus protocols, including EtherCAT, EtherNet/IP, FOUNDATION Fieldbus, Modbus/TCP, and PROFINET. Users can easily create a secure Ethernet Fieldbus network from a user-friendly web UI with a single click. In addition, Moxa's PacketGuard technology (Deep Packet Inspection) helps to filter Modbus TCP commands at OSI layer 7. The wide temperature range models that are available operate reliably in hazardous, -40 to 75°C environments.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
Protocols: SNMPv1/v2c/v3, DHCP Server/Client, TFTP, NTP/SNTP server and client, HTTP, HTTPS, Telnet, SSH, Syslog, SMTP, LLDP, PPPoE, PPTP, Dynamic DNS, traffic prioritization
Routing: Static routing, RIP V1/V2, OSPF
Throughput:
• EDR-G902: Max. 25000 packets per second (or 300 Mbps)
• EDR-G903: Max. 40000 packets per second (or 500 Mbps)
Routing Redundancy: VRRP
VLAN: 5 VLANs per interfaces (VLAN ID: 1 to 4094)
Flow Control: IEEE 802.3x flow control, back pressure flow control

Security Functions

Firewall:
Features:
• Stateful inspection
• Router firewall and transparent (bridge) firewall
• Filter: IP and MAC address, ports, ICMP, Ethernet protocols
• Deep Packet Inspection: Modbus TCP/UDP
• Quick Automation Profiles: EtherCAT, EtherNet/IP, FOUNDATION Fieldbus, LonWorks, Modbus/TCP, PROFINET, IEC 60870-104, DNP, FTP, SSH, Telnet, HTTP, IPSec, L2TP, PPTP, RADIUS
Throughput:
• EDR-G902: Max. 25000 packet per second (or 300 Mbps)
• EDR-G903: Max. 40000 packet per second (or 500 Mbps)
DoS and DDoS Protection: Null Scan, Xmas Scan, NMAP-Xmas Scan, SYN/FIN Scan, FIN Scan, NMAP-ID Scan, SYN/RST Scan, NEW-Without-SYN Scan, ICMP-Death, SYN-Flood, ARP-Flood
NAT: N-to-1, 1-to-1, bidirectional 1-to-1, and port forwarding

IPSec VPN:
Protocols:
• IPSec
• L2TP (server)
• PPTP (client)
Encryption:
• DES, 3DES, AES-128, AES-192, AES-256
Authentication:
• RSA (key size: 1024-bit, 2048-bit)
• X.509 v3 certificate
• MD5 and SHA (SHA-256)
Throughput:
• EDR-G902: Max. 60 Mbps (Condition: AES-246, SHA-256)
• EDR-G903: Max. 150 Mbps (Condition: AES-246, SHA-256)
Concurrent VPN Tunnels:
• EDR-G902: 50 IPSec VPN Tunnels (Max. 15 start in initial mode)
• EDR-G903: 100 IPSec VPN Tunnels (Max. 30 start in initial mode)
OpenVPN:
Protocols:
• OpenVPN (client and server), UDP and TCP
• Tunnel mode (routing) and TAP mode (bridge)
Encryption:
• Blowfish CBC, DES CBC, DES-EDE3 CBC, AES-128/192/256 CBC
Authentication:
• User password by MD5 and SHA1
Concurrent VPN Tunnels:
• Server mode: max. 5 external clients
• Client mode: max. 2 external servers
Real-Time Firewall / VPN Event Log:
• Event Type: Firewall Event, VPN Event, System Security Event
• Media: Local storage, Syslog server, and SNMP trap

Interface

WAN/WAN1: 1 RJ45/Fiber combo port
WAN2/DMZ: 1 RJ45/Fiber combo port
LAN:
EDR-G903: RJ45/SFP combo port
EDR-G902: RJ45
RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed
Fiber Ports: 100/1000BaseSFP slot
LED Indicators: PWR1, PWR2, FAULT, 10/100/1000M
Alarm Contact: One relay output with current-carrying capacity of 1 A @ 24 VDC
Digital Inputs: 1 input
• +13 to +30 V for state “1”
• -30 to +3 V for state “0”
• Max. input current: 8 mA

Power Requirements

Input Voltage: 12/24/48 VDC, redundant dual inputs
Input Current: 0.45 A @ 24 V
Overload Current Protection: Present
Connection: Removable terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP 30 protection
Dimensions: 51 x 152 x 131.1 mm (2.01 x 5.98 x 5.16 in)
Weight: 1250 g (2.82 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95 % (non-condensing)

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Power Automation: IEC 61850-3 (EDR-G903)
Marine: DNV (EDR-G902)
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa’s website for the most up-to-date certification status.

MTBF (mean time between failures)

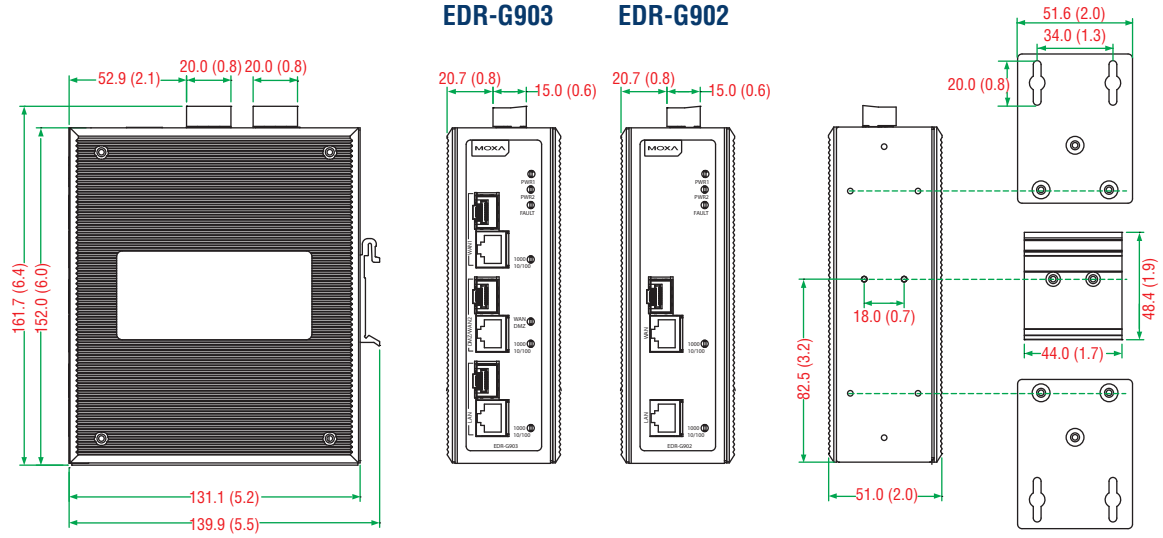
Time: 530,000 hrs
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front Views | Rear View | DIN-Rail/Panel-Mounting Kit

Ordering Information

Available Models

EDR-G902: Industrial secure routers with 1 WAN, firewall/NAT/VPN, 0 to 60°C operating temperature
EDR-G902-T: Industrial secure routers with 1 WAN, firewall/NAT/VPN, -40 to 75°C operating temperature
EDR-G903: Industrial secure router with 2 WAN/1 DMZ, and firewall/NAT/VPN, 0 to 60°C operating temperature
EDR-G903-T: Industrial secure router with 2 WAN/1 DMZ, and firewall/NAT/VPN, -40 to 75°C operating temperature
Note: The EDR-G903/G902 series secure routers support 100/1000BaseSFP slots. See the SFP-1G and SFP-1FE datasheets for Gigabit/Fast Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

DR-4524/75-24/120-24: 45/75/120 W DIN-rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-51-01: Wall-mounting kit, 2 plates with 6 screws
RK-4U: 4U-high 19-inch rack-mounting kit

Package Checklist

- EDR-G903/G902 secure router
- Serial Cable: CN20070
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

Award-winning Product

EDR-810 Series

8+2G multiport industrial secure router with switch/firewall/NAT/VPN

- 8+2G all-in-one firewall/NAT/VPN/router/switch
- Build up secure remote access tunnel with VPN
- Protect critical assets by stateful firewall
- Inspect industrial protocol with PacketGuard technology
- Easy network setup with network address translation (NAT)
- RSTP/Turbo Ring redundant protocol enhances network redundancy
- -40 to 75°C operating temperature range (T model)
- ISA99 / IEC 62443 / NERC CIP compliance
- Check firewall settings with intelligent SettingCheck feature

Introduction

The EDR-810 is a highly integrated industrial multiport secure router with firewall/NAT/VPN and managed Layer 2 switch functions. It is designed for Ethernet-based security applications in sensitive remote control or monitoring networks, and it provides an electronic security perimeter for the protection of critical cyber assets such as pumping/treatment systems in water stations, DCS systems in oil and gas applications, and PLC/SCADA systems in factory automation. The EDS-810 series includes the following cybersecurity features:

- **Firewall/NAT:** Firewall policies control network traffic between different trust zones, and Network Address Translation (NAT) shields the internal LAN from unauthorized activity by outside hosts.
- **VPN:** Virtual Private Networking (VPN) is designed to provide users with secure communication tunnels when accessing a private network from the public Internet. VPNs use IPSec (IP Security) server or client mode for encryption and authentication of all IP packets at the network layer to ensure confidentiality and sender authentication.

The EDR-810's "WAN Routing Quick Setting" provides an easy way for users to set up WAN and LAN ports to create a routing function in four steps. In addition, the EDR-810's "Quick Automation Profile" gives engineers a simple way to configure the firewall filtering function with general automation protocols, including EtherNet/IP, Modbus TCP, EtherCAT, FOUNDATION Fieldbus, and PROFINET. Users can easily create a secure Ethernet network from a user-friendly web UI with a single click, and the EDR-810 is capable of performing deep Modbus TCP packet inspection. Wide temperature range models that operate reliably in hazardous, -40 to 75°C environments are also available.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.1Q for VLAN tagging
IEEE 802.3ad for port trunk
Protocols: SNMP v1/v2c/v3, DHCP server/client, TFTP, NTP/SNTP server/client, HTTP, HTTPS, Telnet, SSH, IPSec, L2TP, IGMP v1/v2/v3, QoS/CoS/ToS, Radius, RSTP/STP, LLDP, DDNS, Proxy ARP
Routing: Static routing, RIP V1/V2, OSPF
Throughput: 10000 packets per second (max. 100 Mbps)
Routing Redundancy: VRRP
Multicast Routing: Static, DVMRP, PIM-SM/SSM
Broadcast Forwarding: IP directed broadcast, broadcast forwarding
Redundancy: STP/RSTP, Turbo Ring V2, Ring Coupling, and Dual Homing
Flow Control: IEEE 802.3x flow control, back pressure flow control

Security Functions

Firewall:
Features:
• Stateful inspection
• Router firewall and transparent (bridge) firewall
• Filter: IP and MAC address, ports, ICMP, DDoS, Ethernet protocols
• Deep Packet Inspection: Modbus TCP/UDP
• Quick Automation Profiles: EtherCAT, EtherNet/IP, FOUNDATION Fieldbus, LonWorks, Modbus/TCP, PROFINET, IEC 60870-104, DNP, FTP, SSH, Telnet, HTTP, IPSec, L2TP, PPTP, RADIUS
Throughput: Max. 10000 packets per second (Max. 100 Mbps)
DoS and DDoS Protection: Null Scan, Xmas Scan, NMAP-Xmas Scan, SYN/FIN Scan, FIN Scan, NMAP-ID Scan, SYN/RST Scan, NEW-Without-SYN Scan, ICMP-Death, SYN-Flood, ARP-Flood
NAT: N-to-1, 1-to-1, bidirectional 1-to-1, and port forwarding

IPSec VPN:
Protocols:
• IPSec
• L2TP (server)
• PPTP (client)
Encryption:
• DES, 3DES, AES-128, AES-192, AES-256
Authentication:
• RSA (key size: 1024-bit, 2048-bit)
• X.509 v3 certificate
• MD5 and SHA (SHA-256)
Throughput:
• Max. 17 Mbps (Conditions: AES-256, SHA-256)
Concurrent VPN Tunnels:
• Max. 10 IPSec VPN tunnels
OpenVPN:
Protocols:
• OpenVPN (client and server), UDP and TCP
• Tunnel mode (routing) and TAP mode (bridge)
Encryption:
• Blowfish CBC, DES CBC, DES-EDE3 CBC, AES-128/192/256 CBC
Authentication:
• User password by MD5 and SHA1
Throughput:
• Max. 5 Mbps
Concurrent VPN Tunnels:
• Server mode: max. 5 external clients
• Client mode: max. 2 external servers
Real-Time Firewall / VPN Event Log:
• Event Type: Firewall Event, VPN Event, System Security Event
• Media: Local storage, Syslog server, and SNMP trap

Switch Properties

Max. Number of VLANs: 16
VLAN ID Range: 1 to 4094
IGMP Groups: 256

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed
Fiber Ports: 1000BaseSFP slot
Console Port: Web/Telnet/SSH/CLI, and RS-232 serial console
RESET button: Reset to default settings
LED Indicators: STATE, PWR1, PWR2, FAULT, 10/100/1000M
Alarm Contact: One relay output with current-carrying capacity of 1 A @ 24 VDC
Digital Inputs: 1 2-contact terminal block
• +13 to +30 V for state “1”
• -30 to +3 V for state “0”
• Max. input current: 8 mA

Power Requirements

Input Voltage: 12/24/48 VDC, redundant dual inputs
Input Current: 0.32 A @ 24 V
Overload Current Protection: Present
Connection: Removable terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal
Dimensions: 53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)
Weight: 830 g (2.10 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Rail Traffic: EN 50121-4
Transportation: NEMA TS2
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa’s website for the most up-to-date certification status.

MTBF (mean time between failures)

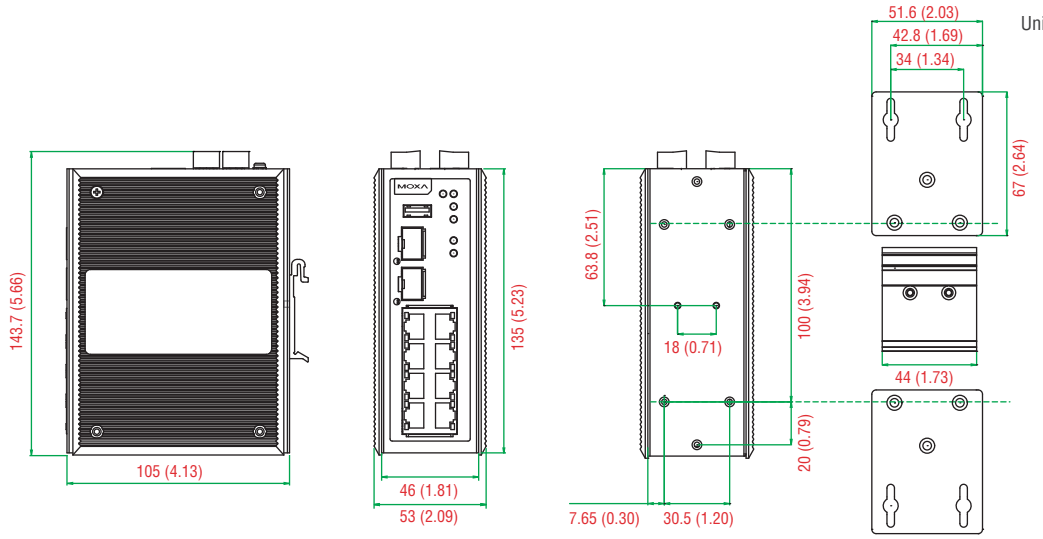
Time: 981,954 hrs
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | DIN-Rail/Panel-Mounting Kit

Ordering Information

Available Models

EDR-810-2GSFP: 8+2G-port industrial multiport secure router with firewall/NAT, -10 to 60°C operating temperature
EDR-810-2GSFP-T: 8+2G-port industrial multiport secure router with firewall/NAT, -40 to 75°C operating temperature
EDR-810-VPN-2GSFP: 8+2G-port industrial multiport secure router with firewall/NAT/VPN, -10 to 60°C operating temperature
EDR-810-VPN-2GSFP-T: 8+2G-port industrial multiport secure router with firewall/NAT/VPN, -40 to 75°C operating temperature

Note: The EDR-810 series supports 1000BaseSFP slots. See the SFP-1G series Gigabit Ethernet SFP module product datasheet for more information.

Package Checklist

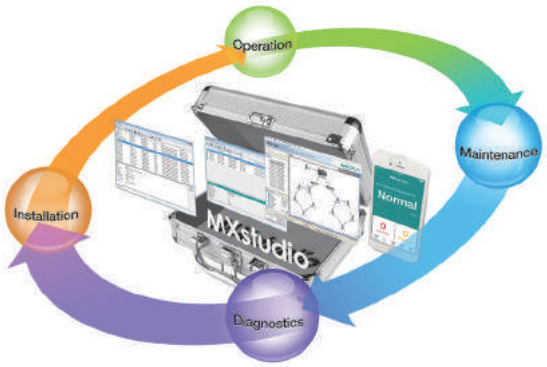
- EDR-810 industrial secure router
- Serial Cable: CN20070
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

ABC-02-USB: Automatic Backup Configurator
DR-4524/75-24/120-24: 45/75/120 W DIN-rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-51-01: Wall-mounting kit, 2 plates with 6 screws
RK-4U: 4U-high 19-inch rack-mounting kit

Introduction to Industrial Network Management

Every industrial network has a life cycle consisting of four basic stages: installation, operation, maintenance, and diagnostics. Even with careful network planning and design, network management throughout all four stages of the industrial network life cycle can still present many challenges for integrators and operators. To optimize network efficiency and minimize the total cost of ownership, industrial automation networks need user-centric software tools for efficient network deployment, monitoring, management, maintenance, and troubleshooting.



Automation-Friendly Software Throughout the Network Life Cycle

Installation

Challenge:
Initial configuration of network devices is generally done one at a time manually, which can require many hours of labor.

Solution:
Moxa's MXconfig, a network configuration tool, can mass-configure every device on the network, including IP settings, redundancy protocols, VLAN, and related managed functions, to significantly reduce the time required for configuration. With MXconfig, you can make configuration 10 times faster.

Operation

Challenge:
Without effective network management software, industrial operators are unable to monitor, identify, and react to network issues immediately, which can result in production losses and safety concerns.

Solution:
Moxa's MXview industrial network management software is a graphical platform that allows engineers to easily monitor and manage up to 2000 nodes in real time. MXview also supports a mobile monitoring app, called MXview ToGo, which allows you to remotely check network status and keep informed of any changes to the network—anytime, anywhere.

Maintenance

Challenge:
Changes to device settings can cause unexpected network issues. When this happens, backup files will need to be restored to a previous state. For a large-scale network, this task is extremely time-consuming and can lead to extended system downtimes.

Solution:
Moxa's MXview allows network operators to select a group of devices and export their configuration files simultaneously for backup, saving a significant amount of time.

Diagnostics

Challenge:
Without knowing where to look and what to actually look for, maintenance engineers can spend hours troubleshooting the network and still fail to find a solution.

Solution:
Moxa's MXview offers a highly intuitive event playback feature that can record network events and replay past network incidents in the order they occurred. In addition, N-Snap industrial network snapshot tool can help collect device information. By comparing abnormal network data with healthy network data, N-Snap can help you troubleshoot the network more efficiently.

Integration with SCADA and Third-Party NMS

Moxa's industrial network management solutions support a built-in SNMP OPC server, which can convert SNMP information into OPC tags that can be seamlessly integrated into OPC-compatible HMI/SCADA systems. Moreover, Moxa's network management solutions can collaborate with third-party network management software, making it easier to monitor and maintain the high availability of larger-scale automation systems.

MXstudio

Industrial network management suite for installation, operation, maintenance, and diagnostics

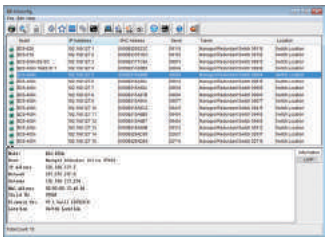
- An all-in-one toolset for installation, operation, maintenance, and diagnostics stages of the network's life cycle
- MXconfig, MXview, and N-Snap for easy and quick industrial network management
- MXview ToGo mobile app for remote monitoring—anytime, anywhere
- Maximized productivity with Moxa industrial Ethernet solutions

Introduction

Moxa's MXstudio industrial network management suite combines all the tools you need throughout the network's life cycle into one toolbox, including MXview industrial management software, MXconfig industrial network configuration tool, and N-Snap industrial network snapshot tool. Whether it is for configuration, monitoring, maintenance, or troubleshooting, the all-in-one MXstudio software suite has a tool for every task. In addition, MXstudio's three key benefits, easy configuration, smart visualization, and quick troubleshooting, are designed to meet the demands of industrial automation networks.

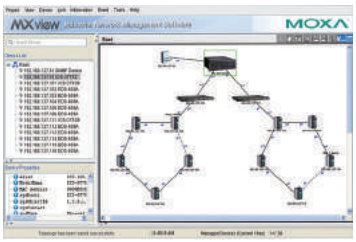
MXstudio's Offerings

MXconfig Industrial Network Configuration Tool



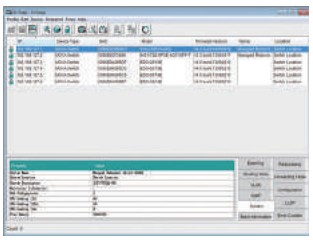
- Mass configuration function to reduce setup time
- Topology analysis to eliminate manual setting errors
- Configuration overview for efficient management

MXview Industrial Network Management Software



- Auto discovery of network devices and physical connections
- Event playback for quick troubleshooting
- Color-coded VLAN/IGMP groups and other visualized network data
- Supports MXview ToGo mobile app for remote monitoring and notification—anytime, anywhere

N-Snap Industrial Network Snapshot Tool



- A stand-alone data collection tool to take network snapshots for quick troubleshooting
- Compare network and device data, and highlight the differences

System Requirements

CPU	2 GHz or faster dual-core CPU
RAM	2 GB
Hard Disk Space	10 GB
OS	Windows XP Professional, Windows 7 (32/64-bit), Windows 8 (32/64-bit), Windows 10 (32/64-bit), Windows Server 2008 (32/64-bit), Windows Server 2012 (32/64-bit)

Ordering Information

A free version is now available for download at Moxa's website.

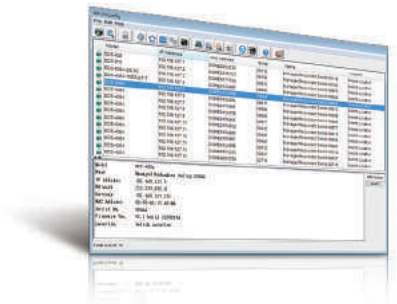
Supported Devices

Detailed model names are available in each product datasheet. Check Moxa's website for the most up-to-date information.

Award-winning Product

MXconfig

Industrial network configuration tool



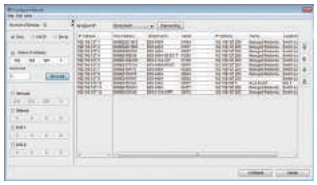
- Mass managed function configuration increases deployment efficiency and reduces setup time
- Mass configuration duplication reduces installation costs
- Link sequence detection eliminates manual setting errors
- Configuration overview and documentation for easy status review and management
- Three user privilege levels enhance security and management flexibility

Introduction

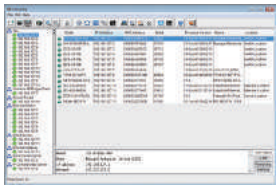
Moxa's MXconfig is a comprehensive Windows-based utility that is used to install, configure, and maintain multiple Moxa devices on industrial networks. This suite of useful tools helps users set the IP addresses of multiple devices with one click, configure the redundant protocols and VLAN settings, modify multiple network configurations of multiple Moxa devices, upload firmware to multiple devices, export/import configuration files, copy configuration settings across devices, easily link to web and Telnet consoles, and test device connectivity. MXconfig gives device installers and control engineers a powerful and easy way to mass configure devices, and it effectively reduces the setup and maintenance cost.

Device Discovery and Fast Group Configuration

- Easy broadcast search of the network for all supported Moxa managed Ethernet devices
- Mass network setting (such as IP addresses, gateway, and DNS) deployment reduces setup time
- Deployment of mass managed functions increases configuration efficiency
- Multiple grouping for easy classification
- User-friendly port selection panel provides physical port descriptions
- VLAN Quick-Add Panel speeds up setup time
- Deploy multiple devices with one click using CLI execution



Network Setting



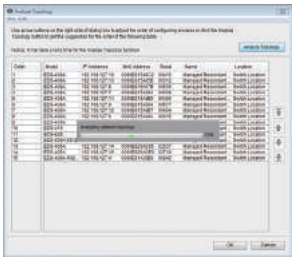
Multiple Grouping

Fast Configuration Deployment

- Quick configuration: copy a specific setting to multiple devices and change IP addresses with one click

Link Sequence Detection

- Link sequence detection eliminates manual configuration errors and avoids disconnections, especially when configuring redundancy protocols or VLAN settings for a network in a daisy chain topology (line topology).
- Link Sequence IP setting (LSIP) prioritizes devices and configures IP addresses by link sequence to enhance deployment efficiency, especially in a daisy chain topology (line topology).



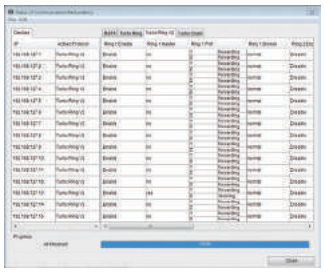
Analyze Topology

Unlock Devices and User Privileges

- Mass device unlocking and password file export for quick unlocks.
- Three user privilege levels to enhance management flexibility and security: Admin, Supervisor, and Operator.

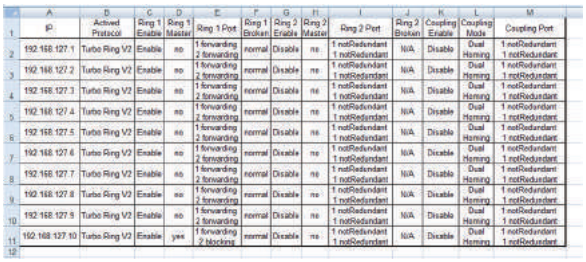
Configuration Overview and Documentation

- Useful mass status overview and configuration check for each managed function.
- Generate reports on each managed function for multiple devices in the network.



Status Overview

- Export multiple configuration files with flexible filenames and import multiple configuration files to multiple devices.
- Export device list for easy backup, and import device list for quick searching.



File Export

System Requirements

CPU	2 GHz or faster dual core CPU
RAM	256 MB
Hard Disk Space	1 GB
Operating System	Windows XP Professional, Windows 7 (32/64-bit), Windows 8 (32/64-bit), Windows 10 (32/64-bit), Windows Server 2008 (32/64-bit), Windows Server 2012 (32/64-bit)

Supported Devices

MXconfig V2.3 supports the following devices:

Series	Model Name	Firmware
AWK Series	AWK-1121	V1.4
	AWK-1127	V1.4
	AWK-3121	V1.10
	AWK-3121-SSC-RTG	V1.4
	AWK-3121-M12-RTG	V1.4
	AWK-3131	V1.2
	AWK-3131-M12-RCC	V1.0
	AWK-4121	V1.10
	AWK-4131	V1.2
	AWK-5222	V1.7
	AWK-5232	V1.3
	AWK-6222	V1.7
	AWK-6232	V1.3
EDR Series	EDR-810	V3.2
EDS Series	EDS-405A/408A	V3.1
	EDS-405A/408A-EIP	V3.1
	EDS-405A/408A-PN	V3.1
	EDS-405A-PTP	V3.3
	EDS-505A/508A/516A	V3.1
	EDS-510A	V3.1
	EDS-518A	V3.1
	EDS-510E/518E	V4.0
	EDS-G508E/G512E/G516E	V4.0
	EDS-G512E-8PoE	V4.0
	EDS-608/611/616/619	V3.1
	EDS-728	V3.1
	EDS-828	V3.1
	EDS-G509	V3.1
	EDS-P510	V3.1
	EDS-P510A-8PoE	V3.1
	EDS-P506A-4PoE	V3.1

Series	Model Name	Firmware
ICS Series	ICS-G7526/G7528	V3.1
	ICS-G7826/G7828	V3.1
	ICS-G7748/G7750/G7752	V3.1
	ICS-G7848/G7850/G7852	V3.1
	ICS-G7526A/G7528A	V4.0
	ICS-G7826A/G7828A	V4.0
	ICS-G7748A/G7750A/G7752A	V4.0
	ICS-G7848A/G7850A/G7852A	V4.0
IEX Series	IEX-402-SHDSL	V1.0
	IEX-402-VDSL2	V1.0
IKS Series	IKS-6726/6728	V3.1
	IKS-G6524	V3.1
	IKS-G6824	V3.1
	IKS-6728-8PoE	V3.1
	IKS-6726A/6728A	V4.0
	IKS-G6524A	V4.0
	IKS-G6824A	V4.0
	IKS-6728A-8PoE	V4.0
MGate Series	MGate MB3170	V1.0
	MGate MB3180	V1.0
	MGate MB3270	V1.0
	MGate MB3280	V1.0
	MGate MB3480	V1.0
	MGate MB3660	V1.0
	MGate EIP3170	V1.0
	MGate EIP3270	V1.0
	MGate 5101-PBM-MN	V1.1
	MGate 5102-PBM-PN	V1.1
	MGate 5105-MB-EIP	V1.0
	MGate W5108	V1.2
	MGate W5208	V1.2

Series	Model Name	Firmware
NPort Series	NPort S8455	V1.4
	NPort S8458	V1.4
PT Series	PT-7528	V3.1
	PT-7710	V3.1
	PT-7728	V3.1
	PT-7828/7828-PTP	V3.1
	PT-G7509	V3.1
	PT-508/510	V3.1
TN Series	TN-5508/5510	V3.1
	TN-5516/5518	V3.1
	TN-5508-4PoE	V3.1
	TN-5510-PoE	V3.1
	TN-5516-8PoE	V3.1
	TN-5518-PoE	V3.1
VPort Series	VPort 26A-1MP	V1.2
	VPort 36-1MP	V1.1
	VPort P06-1MP-M12	V2.2

Note:

- MXconfig supports the listed and higher firmware versions.
- Additional model names will be added as MXconfig is updated. Check Moxa's website for the most up-to-date information.

MXview

Award-winning Product
TAIWAN EXCELLENCE 2010

Industrial network management software designed for converged automation networks

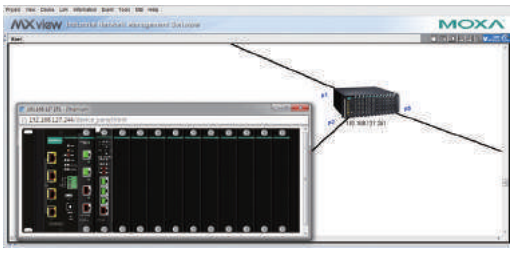
- Event Playback records network events and replays past network incidents
- Discovers and visualizes network devices and physical connections automatically
- Central management of configurations and firmware for Moxa devices
- Flexible events and notifications with self-defined threshold and duration
- Supports third-party devices with MIB compiler and MIB browser
- Comprehensive reports, including inventory, traffic, and availability reports
- Generates OPC 2.0 compliant tags automatically to integrate with SCADA/HMI applications
- Provides a virtual demonstration network that lets you experience the software without connecting any devices
- Supports MXview ToGo mobile app for remote monitoring and notification—anytime, anywhere

Introduction

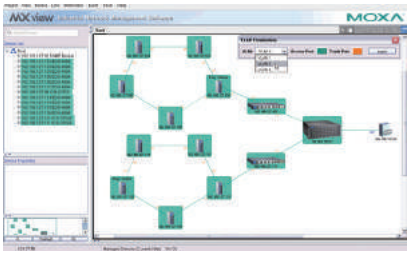
Moxa's MXview network management software is designed for configuring, monitoring, and diagnosing networking devices in industrial networks. MXview provides an integrated management platform that can discover networking devices and SNMP/IP devices installed on subnets. All selected network components can be managed via a web browser from both local and remote sites—anytime and anywhere.

Visualization

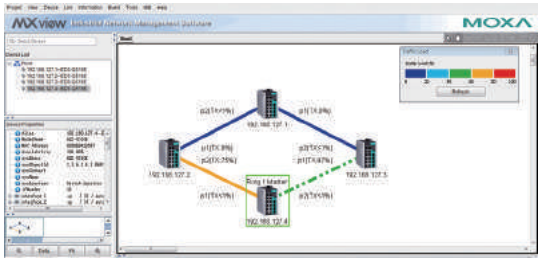
- Discovers up to 2,000 Moxa devices and SNMP/ICMP devices within scan range
- Visualization of redundant link status and device roles of network redundancy protocols
- Visualization of graphic VLAN groups and IGMP snooping roles
- Visualization of network traffic loading with color-coded links
- Device front panel visualization, including ports and LED indicators
- Visualization of managed PoE device power consumption
- Displays third-party device icons



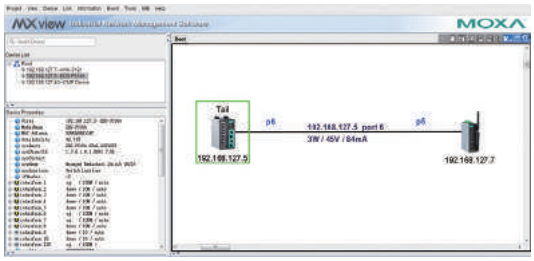
Virtual Device Panel



VLAN Visualization



Traffic Load Visualization

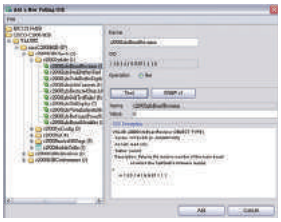


PoE Visualization

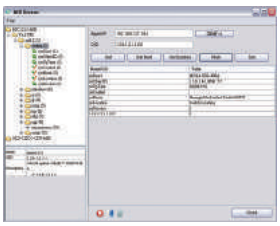
Network Diagnostics and Event Notification

- Detect problems in real-time with SNMP trap/inform, or periodic polling
- Generate trend graphs to track bandwidth utilization and error packet rate statistics, accurate to four decimal points
- Event Playback records network events, and replays past network incidents
- Flexible events and notifications with self-defined threshold and duration
- Supports Syslog server for centralized message management
- Configurable event notification alarms sent through SMS, email, and SNMP trap, or locally through program notification, message box, and audio alerts
- Generates OPC 2.0 compliant tags automatically to integrate with SCADA/HMI applications
- Group health OPC tag represents entire network status
- Real-time device availability monitoring
- Supports third-party devices with MIB compiler and MIB browser
- Collaborates with third-party NMS through SNMP traps

Traffic Monitoring



MIB Compiler



MIB Browser

Event Playback

Comprehensive Reports

- Maintains device availability reports and records for up to 90 days
- Generates an inventory report for each device in the network
- Compiles comprehensive device properties report
- Generates network traffic trend reports

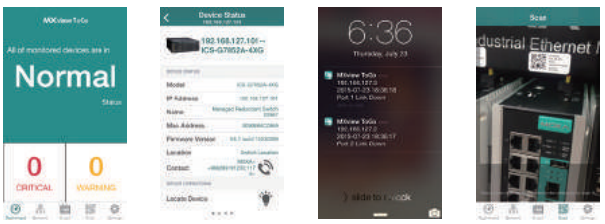
Availability and Inventory Report

Centralized Configuration and Firmware Management

- Bulk deployment of device configurations and firmware
- In one click, back up the entire MXview database in one click, including topology, job scheduling, events, and device properties
- Scheduling for periodic configuration backup
- Save history of configuration changes
- Comparison tool for checking differences between 2 configurations

Mobile APP for Network Monitoring

- MXview ToGo mobile app for remote monitoring and notification—anytime, anywhere
- Smart Device Identification with QR Code enhances operational efficiency
- Device Locator with mobile app reduces searching time at field sites



System Requirements

CPU	2 GHz or faster dual-core CPU
RAM	2 GB
Hard Disk Space	10 GB
OS	Windows XP Professional, Windows 7 (32/64-bit), Windows 8 (32/64-bit), Windows 10 (32/64-bit), Windows Server 2008 (32/64-bit), Windows Server 2012 (32/64-bit)

Ordering Information

Commercial Versions

MXview-2000: Industrial network management software with a license for 2000 nodes (by IP address)
MXview-1000: Industrial network management software with a license for 1000 nodes (by IP address)
MXview-500: Industrial network management software with a license for 500 nodes (by IP address)
MXview-250: Industrial network management software with a license for 250 nodes (by IP address)
MXview-100: Industrial network management software with a license for 100 nodes (by IP address)
MXview-50: Industrial network management software with a license for 50 nodes (by IP address)

Package Checklist

- MXview CD (includes the MXview software and related documents)
- License card

License Upgrade

MXview Upgrade-50: License expansion of MXview industrial network management software by 50 nodes (by IP address)

Trial Version

MXview Trial Version: A free trial version of MXview is available for download from Moxa's website

Supported Devices

MXview v2.6 supports the following devices by default.

Series	Model Name	Firmware
AWK Series	AWK-1121	V1.4
	AWK-1127	V1.4
	AWK-3121	V1.6
	AWK-3131	V1.1
	AWK-4121	V1.6
	AWK-4131	V1.1
EDR Series	EDR-G903	V2.1
	EDR-G902	V1.0
	EDR-810	V3.2
EDS Series	EDS-405A/408A	V2.6
	EDS-405A/408A-EIP	V3.0
	EDS-405A/408A-PN	V3.1
	EDS-405A-PTP	V3.3
	EDS-505A/508A/516A	V2.6
	EDS-510A	V2.6
	EDS-518A	V2.6
	EDS-510E/518E	V4.0
	EDS-G508E/G512E/G516E	V4.0
	EDS-G512E-8PoE	V4.0
	EDS-608/611/616/619	V1.1
	EDS-728	V2.6
	EDS-828	V2.6
	EDS-G509	V2.6
	EDS-P510	V2.6
	EDS-P510A-8PoE	V3.1
	EDS-P506A-4PoE	V2.6
EOM Series	EOM-104/104-FO	V1.2
ICS Series	ICS-G7526/G7528	V1.0
	ICS-G7826/G7828	V1.1
	ICS-G7748/G7750/G7752	V1.2
	ICS-G7848/G7850/G7852	V1.2
	ICS-G7526A/G7528A	V4.0
	ICS-G7826A/G7828A	V4.0
	ICS-G7748A/G7750A/G7752A	V4.0
	ICS-G7848A/G7850A/G7852A	V4.0

Series	Model Name	Firmware
IEX Series	IEX-402-SHDSL	V1.0
	IEX-402-VDSL2	V1.0
IKS Series	IKS-6726/6728	V2.6
	IKS-6524/6526	V2.6
	IKS-G6524	V1.0
	IKS-G6824	V1.1
	IKS-6728-8PoE	V3.1
	IKS-6726A/6728A	V4.0
	IKS-G6524A	V4.0
	IKS-G6824A	V4.0
	IKS-6728A-8PoE	V4.0
ioLogik Series	ioLogik E2210	V3.7
	ioLogik E2212	V3.7
	ioLogik E2214	V3.7
	ioLogik E2240	V3.7
	ioLogik E2242	V3.7
	ioLogik E2260	V3.7
	ioLogik E2262	V3.7
	ioLogik W5312	V1.7
	ioLogik W5340	V1.8
MGate Series	MGate MB3170	V1.0
	MGate MB3180	V1.0
	MGate MB3270	V1.0
	MGate MB3280	V1.0
	MGate MB3480	V1.0
	MGate MB3660	V1.0
	MGate EIP3170	V1.0
	MGate EIP3270	V1.0
	MGate 5101-PBM-MN	V1.1
	MGate 5102-PBM-PN	V1.1
	MGate 5105-MB-EIP	V1.0
	MGate W5108	V1.2
	MGate W5208	V1.2

Series	Model Name	Firmware
NPort Series	NPort S8455	V1.3
	NPort S8458	V1.3
	NPort 5110	V2.4
	NPort 5130/5150	V3.4
	NPort 5210/5230/5232	V2.6
	NPort 5410/5430/5450	V3.9
	NPort 5600-8-DT/5650-8-DT	V2.2
	NPort 5600	V3.5
	NPort 5610-8-DTL/5650-8-DTL	V1.1
	NPort 5110A/5130A/5150A	V1.1
	NPort 5210A/5230A/5250A	V1.1
	NPort IA5150/IA5250	V1.4
	NPort IA5150A/IA5250A	V1.1
	NPort IA5450A	V1.2
	NPort 6150/6250/6450	V1.9
	NPort 6610-8/6610-16/6610-32	V1.9
	NPort 6650-8/6650-16/6650-32	V1.9
	NPort 5150AI-M12	V1.0
	NPort 5250AI-M12	V1.0
	NPort 5450AI-M12	V1.0
PT Series	PT-7528	V3.0
	PT-7710	V1.2
	PT-7728	V2.6
	PT-7828	V2.6
	PT-G7509	V1.1
	PT-508/510	V3.0
	PT-G503-PHR-PTP	V4.0
TN Series	TN-5508/5510	V1.1
	TN-5516/5518	V1.2
	TN-5508-4PoE	V2.6
	TN-5516-8PoE	V2.6
VPort Series	VPort 26A-1MP	V1.2
	VPort 36-1MP	V1.1
	VPort P06-1MP-M12	V2.2

Note: MXview supports the listed or higher firmware versions.
Note: Additional model names will be added as MXview is updated. Check Moxa's website for the most up-to-date information.

Industrial Wireless LAN Solutions

Product Selection Guide

Industrial Wireless IEEE 802.11 Solutions 6-2

Introduction

Introduction to Industrial Wireless LAN Solutions 6-3

Single-Radio Wireless AP/Bridge/Client

AWK-1131A Series: Entry-level industrial IEEE 802.11a/b/g/n wireless AP/client 6-6

AWK-3131A Series: Industrial IEEE 802.11a/b/g/n wireless AP/bridge/client 6-9

AWK-4131A Series: Outdoor industrial IEEE 802.11a/b/g/n wireless AP/bridge/client 6-12

AWK-3191 Series: Industrial 900 MHz wireless AP/bridge/client 6-15

Dual-Radio Wireless AP/Bridge/Client

AWK-5232 Series: Industrial IEEE 802.11a/b/g/n dual-radio wireless AP/bridge/client 6-17

AWK-6232 Series: Outdoor industrial IEEE 802.11a/b/g/n dual-radio wireless AP/bridge/client 6-19

Wireless Antennas and Accessories

Wireless Antenna Selection Guide 6-21

Wireless Accessories Selection Guide 6-22

6

Industrial Wireless LAN Solutions

Industrial Wireless IEEE 802.11 Solutions

Preliminary

	Single-RF Wireless Tranceiver				Dual-RF Wireless Tranceiver	
	AWK-1131A	AWK-3131A	AWK-4131A	AWK-3191	AWK-5232	AWK-6232
WLAN						
Wireless Standard	802.11a/b/g/n	802.11a/b/g/n	802.11a/b/g/n	900 MHz	802.11a/b/g/n	802.11a/b/g/n
Number of RF Modules	1	1	1	1	2	2
Maximum Data Rate	300 Mbps	300 Mbps	300 Mbps	54 Mbps	300 Mbps	300 Mbps
Transmission Distance (with Default Antennas)	Up to 100 meters (in open areas)	Up to 100 meters (in open areas)	Up to 100 meters (in open areas)	Up to 30 km point-to-point (with high gain Yagi-antennas)	Up to 100 meters (in open areas)	Up to 100 meters (in open areas)
Interfaces						
Total Number of Antenna Ports	2 (2x2 MIMO)	2 (2x2 MIMO)	2 (2x2 MIMO)	2 (2R1T Diversity)	4 (2x2 MIMO)	4 (2x2 MIMO)
Antenna Port Type	RP-SMA (female)	RP-SMA (female)	N-Type (female)	RP-SMA (female)	RP-SMA (female)	N-Type (female)
Total Number of LAN Ports	1	1	1	1	2	2
LAN Port Type	RJ45	RJ45	Waterproof RJ45	RJ45	RJ45	M12 (female 8-pin A-coded)
LAN Port Speed	10/100/1000BaseT(X)	10/100/1000BaseT(X)	10/100/1000BaseT(X)	10/100BaseT(X)	10/100/1000BaseT(X)	10/100/1000BaseT(X)
RS-232 Console Ports	1, RJ45	1, RJ45	1, waterproof RJ45	1, RJ45	1, RJ45	1, waterproof RJ45
DI/DO	–	✓	✓	✓	✓	✓
DI/DO Connection Type	–	10-pin terminal block	M12 (female 8-pin A-coded)	10-pin terminal block	10-pin terminal block	M12 (male 8-pin A-coded)
Housing Protection						
IP-rating	IP30	IP30	IP68	IP30	IP30	IP68
Installation Options						
DIN-Rail Mounting	✓	✓	✓ (optional)	✓	✓	✓ (optional)
Wall Mounting	✓ (optional)	✓ (optional)	✓	✓ (optional)	✓ (optional)	✓
Pole Mounting	–	–	✓ (optional)	–	–	✓ (optional)
Supported Operating Temperatures						
-25 to 60°C (-13 to 140°F)	–	✓	–	✓	✓	–
0 to 60°C (32 to 140°F)	✓	–	–	–	–	–
-40 to 75°C (-40 to 167°F)	✓	✓	✓	✓	✓	✓
Power Requirements						
Input Voltage	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC
Connector Type	4-pin terminal block	10-pin terminal block	M12 (male 5-pin A-coded)	10-pin terminal block	10-pin terminal block	M12 (male 5-pin A-coded)
PoE Support	–	✓	✓	✓	✓	✓
Reverse Polarity Protection	✓	✓	✓	✓	✓	✓
Standards and Certifications						
Safety	UL 60950-1, EN 60950-1	UL 60950-1, EN 60950-1	UL 60950-1, EN 60950-1	UL 60950-1	UL 60950-1, EN 60950-1	UL 60950-1, EN 60950-1
Hazardous Location	–	UL/cUL CI D2, ATEX Zone 2, IECEx	–	UL/cUL CI D2	–	–
EMC	EN 55022/24	EN 61000-6-2/6-4	EN 61000-6-2/6-4	–	EN 55022/55024	EN 55022/24
Radio	EN 301 489-1/17, EN 300 328, EN 301 893, TELEC, FCC ID SLE-WAPN005	EN 301 489-1/17, EN 300 328, EN 301 893, TELEC, FCC ID SLE-WAPN005	EN 301 489-1/17, EN 300 328, EN 301 893, TELEC, FCC ID SLE-WAPN008	FCC ID SLE-WAFS001	EN 301 489-1/17, EN 300 328, EN 301 893, TELEC, FCC ID SLE-WAPN001	EN 301 489-1/17, EN 300 328, EN 301 893, TELEC, FCC ID SLE-WAPN001
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Introduction to Industrial Wireless LAN Solutions

Industry has already accepted wireless networking as an excellent solution for many different applications. The main advantages are the convenience of connecting devices without relying on wired networks, and avoiding the cost of installing wire conduits at sites where doing so would be prohibitive.

IEEE 802.11 is not a wholesale replacement of broadband, but it is a fast and efficient way to distribute broadband transmissions. Wireless communication provides an easier way to connect devices, particularly in remote locations or harsh environments.

Enabling Mobile Wi-Fi Networks for the Industrial Internet of Things

In this age of the Industrial Internet of Things (IoT), mobile Wi-Fi networks are the cornerstones of industrial applications as many of them include equipment that's constantly on the move. Automated guided vehicles, transport vehicles, and other vehicles that use Wi-Fi technology to connect to a single converged network can take advantage of the continuing improvements in IEEE 802.11 technology, which include higher bandwidth protocols and IP-based networking that make it possible to enable big bandwidth communication from wired to wireless Ethernet networks for the Industrial IoT.

Although the Industrial IoT increases the ability of machine to machine communications, it also increases the risk of downtime on these large converged networks due to their single point of failure. Constructing a reliable mobile Wi-Fi network is essential to minimizing system downtime and achieving non-stop operation for industrial applications.

Moxa's industrial wireless LAN solutions offer high reliability and availability features that make it easy for industrial operators to build an unbreakable wireless network that takes advantage of all the latest innovations to deliver substantial cost savings, easier set up and maintenance, and greater operational efficiency.

Wi-Fi Networks Enable a Variety of Mobile Applications

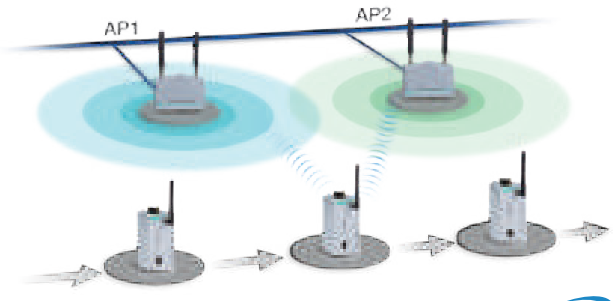
Automated Guided Vehicles

Transportation

Mining

Client-Based Turbo Roaming for Seamless Connections

IEEE 802.11 technology gives networks an effective range of only a few hundred meters. When wireless clients are on moving objects they need to "roam" between many wireless access points. However, in many applications, users need an uninterrupted network data connection when the client moves from one access point to another. Without fast roaming time, constant roaming could create frequent handoffs and poor performance. Moxa's proprietary Turbo Roaming has a fast handover time of less than 150 ms. Turbo Roaming increases the roaming speed by pre-defining AP channels and avoiding wasted channel-hopping time while roaming. Moxa's APs support Turbo Roaming technology to provide fast seamless roaming on wireless networks.



Turbo Roaming

Wireless Redundancy

Industrial environments contain many elements that can cause failures in the underlying wireless network. For example, a microwave transmitter that constantly emits radio waves at 2.4 GHz will likely interfere with or interrupt the operation of Wi-Fi radios that are not configured to guard against such interference. Another example is a wireless network in a harbor that is interrupted when a truck unexpectedly blocks the wireless signal's line-of-sight. Wireless redundancy is essential to ensure continuous wireless transmission for mission-critical applications and to guard against interference from the industrial environment.

Network-Level Wireless Redundancy: AeroLink Protection

Moxa's innovative AeroLink Protection technology provides a smart failover method with fast recovery time and scalability, making it easy to enable multiple layers of wireless connection protection to maximize your mission-critical system uptime and keep your entire network alive for continuous transmission.

With AeroLink Protection, a network has two or more AeroLink Protection-enabled wireless client nodes connected to a single access point. One serves as the active node, while the others are passive, backup nodes. If the active node stops sending or receiving data for any reason, AeroLink Protection completely restores the communication link within milliseconds by bringing backup nodes online. Furthermore, the passive node can be connected to a different access point on a different frequency, providing frequency-level redundancy. It prevents system downtime from both device failure and frequency interruption offering comprehensive wireless redundancy for your wireless networks.

Dual-Radio Wireless Redundancy

Moxa's concurrent dual-radio transmission technology virtually eliminates the possibility of wireless interference. The concept of concurrent dual-radio technology is simple: for every outbound packet, a duplicate packet is sent simultaneously via the secondary frequency to ensure that at least one of the packets reaches the receiver. Latency-sensitive applications can be deployed across a concurrent dual-radio wireless network because the chance that an unintentional source of interference can simultaneously disrupt both bands (2.4 GHz and 5 GHz) is highly unlikely. In case of any frequency interruptions, unlike traditional solutions, this technology can achieve zero packet loss.

Industrial Designs

Industrial-grade rugged design is indispensable for mission-critical systems running under harsh conditions. Moxa's wireless products offer RF isolation, power isolation, wide operating temperature, and high ingress protection to ensure that your wireless connections are stable, even in severe environments.

Dual Isolation: Power and RF

To simplify installation, the new AWK-A series is designed with integrated dual isolation protection. First, Integrated RF Isolation provides 500 V insulation protection and level 4 ESD protection on all antenna ports, without loss of the RF signal. In addition, Integrated Power Isolation provides 500 V insulation protection and stabilizes system voltage from unstable power inputs. This unique built-in design not only protects your device from environmental damage, it also makes field site installation much easier by reducing the need for additional accessories.

DFS Channel Support

Wi-Fi frequency channels are strictly limited by regulations. Therefore, using as much of the available bandwidth as possible is the only way to maximize wireless throughput and performance. So channel planning is extremely important in the system integrator's initial design. As well as using all the normally available frequencies, Moxa's AWK-A series is certified to operate on DFS (Dynamic Frequency Selection) channels, significantly increasing the total number of available channels. When switching to a new DFS channel, regulations require a 60-second delay to ensure that the channel is clear of radar signals before transmitting. Even so, the ability to use DFS channels greatly improves the overall bandwidth capacity of wireless networks.

Designed for Harsh Environments

Moxa's wireless LAN solutions operate in a wide temperature range of -40 to 75°C. Moreover, their IP30 and IP68 ratings provide additional protection in outdoor environments.

900 MHz Long Distance Communications

Deploying long distance communication is usually expensive for industrial applications that require a fast and reliable connection. Moxa's AWK-3191 wireless AP/bridge/client not only eliminates the wiring expense, it also gives users field tested 900 MHz wireless communication at a 6 Mbps data rate over a distance of 30 km, providing an excellent alternative to expensive microwave radios.

Unlike traditional point-to-point 900 MHz devices, the AWK-3191 supports both master/slave and AP/client operation modes to enable both point-to-point and point-to-multi-point communication for the line-of-sight applications required by a wide range of applications, including open-pit mining, offshore drilling, pipeline monitoring, and various oil and gas field communication applications.

Wireless Interoperability

High interoperability in wireless devices makes it easier for operators to install, operate, and maintain wireless networks. The next generation of devices in the AWK-A series comes with a certification for interoperability from the Wi-Fi Alliance, and features the MAC clone function that simplifies the deployment of your wireless network.

Smart Factory Automation with MAC Clone Function

The AWK-A series can automatically clone the MAC address of a connected Ethernet device by simply enabling the MAC Clone feature. The MAC Clone feature is particularly important for automation networks where PLCs won't allow connection requests from unregistered MAC addresses.

Wi-Fi Alliance Certified Interoperability

With the advancement of handheld technologies, smart phones and tablet computers have become important gadgets in everyone's life. These devices are not only serving daily personal communication and entertainment needs, but also are now increasingly being used in work-related operations. To ensure that the Wi-Fi access points can reliably communicate with different brands of handheld devices, they must conform to the Wi-Fi standard. Wi-Fi Alliance is a non-profit organization that promotes Wi-Fi technology and certifies Wi-Fi products. The devices are certified only after they go through rigorous testing on multiple radio and data formats, security protocols, and power management mechanisms. Devices certified by the Wi-Fi Alliance have a higher level of interoperability than the non-certified devices. Moxa's AWK-A series wireless radios certified by the Wi-Fi Alliance for interoperability are compatible with other Wi-Fi devices that are available in the field today.

			Single-RF Wireless Transceiver				Dual-RF Wireless Transceiver	
Category	**Features**		**AWK-1131A**	**AWK-3131A**	**AWK-4131A**	**AWK-3191**	**AWK-5232**	**AWK-6232**
Wireless Communication	Client-based Turbo Roaming		✓	✓	✓	–	✓	✓
	Long Distance Communication		–	10 km point-to-point communication (with high-gain directional antenna)	10 km point-to-point communication (with high-gain directional antenna)	30 km point-to-point communication (with high-gain directional antenna)	–	–
Wireless Redundancy	AeroLink Protection		–	✓	✓	–	–	–
	Dual Radio Wireless Redundancy		–	–	–	–	✓	✓
Extreme Reliability	Power Isolation		✓	✓	✓	✓	–	–
	Antenna Isolation		✓	✓	✓	✓	–	–
	Operating Temp.	Standard	0 to 60°C (32 to 140°F)	-25 to 60°C (-13 to 140°F)	–	-25 to 60°C (-13 to 140°F)	-25 to 60°C (-13 to 140°F)	–
		Wide	-40 to 75°C (-40 to 167°F)	-40 to 75°C (-40 to 167°F)	-40 to 75°C (-40 to 167°F)	-40 to 75°C (-40 to 167°F)	-40 to 75°C (-40 to 167°F)	-40 to 75°C (-40 to 167°F)
	Ingress Protection		IP30	IP30	IP68	IP30	IP30	IP68
	Hazardous Location		–	Class I Div II ATEX Zone 2	–	Class I Div II	–	–
	5 GHz DFS Channel Support		✓	✓	✓	–	–	–
Interoperability	MAC Clone		✓	✓	✓	–	–	–
	Wi-Fi Alliance Certified		✓	✓	✓	–	–	–

AWK-1131A Series

Entry-level industrial IEEE 802.11a/b/g/n wireless AP/client

- IEEE 802.11a/b/g/n AP/client support
- Seamless roaming with Turbo Roaming
- Integrated antenna and power isolation
- 5 GHz DFS channel support

Introduction

The AWK-1131A industrial wireless AP/client meets the growing need for faster data transmission speeds by supporting IEEE 802.11n technology with a net data rate of up to 300 Mbps. The AWK-1131A is compliant with industrial standards and approvals covering operating temperature, power input voltage, surge, ESD, and vibration. The two redundant DC power inputs increase the reliability of the power supply. The AWK-1131A can operate on either the 2.4 or 5 GHz bands and is backwards-compatible with existing 802.11a/b/g deployments to future-proof your wireless investments.

Improved Higher Data Rate and Channel Capacity

- High-speed wireless connectivity with up to 300 Mbps data rate
- MIMO technology to improve the capability of transmitting and receiving multiple data streams
- Increased channel width with channel bonding technology
- Supports flexible channel selection to build up wireless communication system with DFS

Specifications for Industrial-Grade Applications

- Redundant DC power inputs
- Integrated isolation design with enhanced protection against environmental interference
- Compact aluminum housing, IP30-rated

Specifications

WLAN Interface

Standards:
IEEE 802.11a/b/g/n for Wireless LAN
IEEE 802.11i for Wireless Security
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3ab for 1000BaseT

Spread Spectrum and Modulation (typical):
• DSSS with DBPSK, DQPSK, CCK
• OFDM with BPSK, QPSK, 16QAM, 64QAM
• 802.11b: CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBPSK @ 1 Mbps
• 802.11a/g: 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps
• 802.11n: 64QAM @ 300 Mbps to BPSK @ 6.5 Mbps (multiple rates supported)

Operating Channels (central frequency):
US:
2.412 to 2.462 GHz (11 channels)
5.180 to 5.240 GHz (4 channels)
5.260 to 5.320 GHz (4 channels)*
5.500 to 5.700 GHz (8 channels, excluding 5.600 to 5.640 GHz)*
5.745 to 5.825 GHz (5 channels)
EU:
2.412 to 2.472 GHz (13 channels)
5.180 to 5.240 GHz (4 channels)
5.260 to 5.320 GHz (4 channels)*
5.500 to 5.700 GHz (11 channels)*
JP:
2.412 to 2.484 GHz (14 channels, DSSS)
5.180 to 5.240 GHz (4 channels)
5.260 to 5.320 GHz (4 channels)*
5.500 to 5.700 GHz (11 channels)*

*DFS (Dynamic Frequency Selection) channel support: In AP mode, when a radar signal is detected, the device will automatically switch to another channel. However according to regulations, after switching channels, a 60-second availability check period is required before starting the service.

Security:
• SSID broadcast enable/disable
• Firewall for MAC/IP/Protocol/Port-based filtering
• 64-bit and 128-bit WEP encryption, WPA/WPA2-Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP, and AES)

Transmission Rates:
802.11b: 1, 2, 5.5, 11 Mbps
802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11n: 6.5 to 300 Mbps (multiple rates supported)

TX Transmit Power:
802.11b:
Typ. 23±1.5 dBm @ 1 Mbps, Typ. 23±1.5 dBm @ 2 Mbps,
Typ. 20±1.5 dBm @ 5.5 Mbps, Typ. 19±1.5 dBm @ 11 Mbps
802.11g:
Typ. 20±1.5 dBm @ 6 to 24 Mbps, Typ. 19±1.5 dBm @ 36 Mbps,
Typ. 18±1.5 dBm @ 48 Mbps, Typ. 17±1.5 dBm @ 54 Mbps

802.11n (2.4 GHz):
Typ. 20±1.5 dBm @ MCS0/8 20 MHz,
Typ. 16±1.5 dBm @ MCS7/15 20 MHz
Typ. 20±1.5 dBm @ MCS0/8 40 MHz,
Typ. 16±1.5 dBm @ MCS7/15 40 MHz
802.11a:
Typ. 20±1.5 dBm @ 6 to 24 Mbps, Typ. 19±1.5 dBm @ 36 Mbps,
Typ. 16±1.5 dBm @ 48 Mbps,Typ. 15±1.5 dBm @ 54 Mbps
802.11n (5 GHz):
Typ. 19±1.5 dBm @ MCS0/8 20 MHz,
Typ. 14±1.5 dBm @ MCS7/15 20 MHz
Typ. 18±1.5 dBm @ MCS0/8 40 MHz,
Typ. 14±1.5 dBm @ MCS7/15 40 MHz
Note: Based on regional regulations, the maximum transmission power allowed on the UNII bands is restricted in the firmware, as indicated below:

	US	EU	JP
2.4 GHz	20 dBm	20 dBm	20 dBm
5 GHz (UNII-1)	17 dBm	20 dBm	20 dBm
5 GHz (UNII-2)	20 dBm	20 dBm	20 dBm
5 GHz (UNII-2e)	20 dBm	20 dBm	20 dBm
5 GHz (UNII-3)	20 dBm	20 dBm	20 dBm

RX Receive Sensitivity:
802.11b:
-90 dBm @ 1 Mbps, -88 dBm @ 2 Mbps,
-86 dBm @ 5.5 Mbps, -84 dBm @ 11 Mbps
802.11g:
-85 dBm @ 6 Mbps, -84 dBm @ 9 Mbps,
-83 dBm @ 12 Mbps, -82 dBm @ 18 Mbps,
-80 dBm @ 24 Mbps, -76 dBm @ 36 Mbps,
-70 dBm @ 48 Mbps, -70 dBm @ 54 Mbps
802.11n (2.4 GHz):
-70 dBm @ MCS7 20 MHz, -68 dBm @ MCS15 20 MHz
-65 dBm @ MCS7 40 MHz, -63 dBm @ MCS15 40 MHz
802.11a:
-92 dBm @ 6 Mbps, -89 dBm @ 9 Mbps,
-85 dBm @ 12 Mbps, -82 dBm @ 18 Mbps,
-80 dBm @ 24 Mbps, -76 dBm @ 36 Mbps,
-74 dBm @ 48 Mbps, -72 dBm @ 54 Mbps
802.11n (5 GHz):
-70 dBm @ MCS7 20 MHz, -67 dBm @ MCS15 20 MHz
-68 dBm @ MCS7 40 MHz, -66 dBm @ MCS15 40 MHz

Protocol Support
General Protocols: Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNTP, TCP, UDP, RADIUS, SNMP, DHCP, LLDP

Interface
Default Antennas: 2 dual-band omni-directional antennas, 2 dBi, RP-SMA (male)
Connector for External Antennas: RP-SMA (female)
LAN Ports: 1, RJ45, 10/100/1000BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Console Port: RS-232 (RJ45-type)
Reset: Present
LED Indicators: PWR, FAULT, STATE, SIGNAL*, WLAN, 10/100/1000 (RJ45 port)
*signal strength indicator

Management
Device Management: Wireless Search Utility, MXconfig, SNMP
Network Monitoring: MXview

Physical Characteristics
Housing: Metal, IP30 protection
Weight: 307 g (0.68 lb)
Dimensions: 58 x 115 x 70 mm (2.29 x 4.53 x 2.76 in)
Installation: DIN-rail mounting (standard), wall mounting (optional)

Environmental Limits
Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5% to 95% (non-condensing)

Power Requirements
Input Voltage: 12 to 48 VDC, redundant dual DC power inputs
Input Current: 0.56 A @ 12 VDC; 0.14 A @ 48 VDC
Connector: 4-pin removable terminal block, 500 V insulation
Power Consumption: 6.96 W
Reverse Polarity Protection: Present

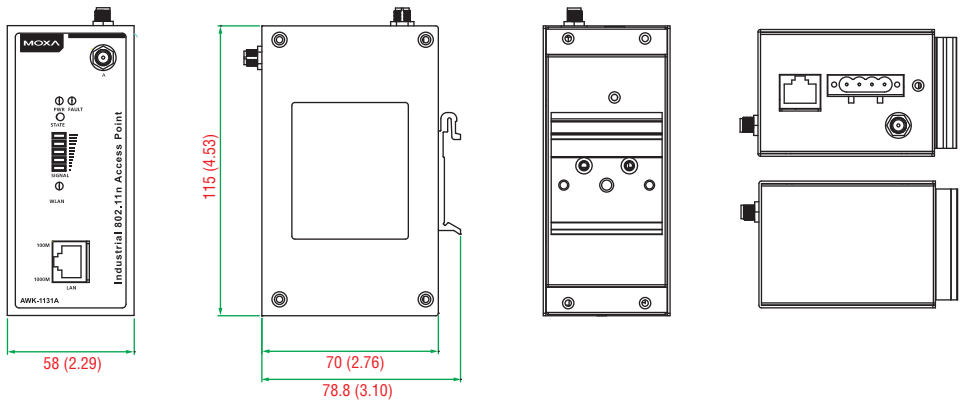
Standards and Certifications
Safety: UL 60950-1, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 3 V
IEC 61000-4-8
Radio: EN 301 489-1/17, EN 300 328, EN 301 893, TELEC, FCC ID SLE-WAPN005
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)
Time: 810,022 hrs
Standard: Telcordia SR332

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Front View | Side View | Rear View | Top & Bottom Views

Ordering Information

Available Models

AWK-1131A-US: IEEE 802.11a/b/g/n wireless AP/client, US band, 0 to 60°C operating temperature
AWK-1131A-US-T: IEEE 802.11a/b/g/n wireless AP/client, US band, -40 to 75°C operating temperature
AWK-1131A-EU: IEEE 802.11a/b/g/n wireless AP/client, EU band, 0 to 60°C operating temperature
AWK-1131A-EU-T: IEEE 802.11a/b/g/n wireless AP/client, EU band, -40 to 75°C operating temperature
AWK-1131A-JP: IEEE 802.11a/b/g/n wireless AP/client, JP band, 0 to 60°C operating temperature
AWK-1131A-JP-T: IEEE 802.11a/b/g/n wireless AP/client, JP band, -40 to 75°C operating temperature

Note: Please visit Moxa's website for a complete list of optional wireless accessories and antennas available for Moxa's wireless products.

Package Checklist

- AWK-1131A wireless AP/client
- 2 2.4/5 GHz antennas: ANT-WDB-ARM-02
- DIN-rail kit
- 1 plastic RJ45 protective cap
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

AWK-3131A Series

Industrial IEEE 802.11a/b/g/n wireless AP/bridge/client

- IEEE 802.11a/b/g/n AP/bridge/client support
- Seamless roaming with Turbo Roaming
- Complete redundancy with AeroLink Protection
- Integrated antenna and power isolation
- -40 to 75°C operating temperature range (-T models)
- 5 GHz DFS channel support

Introduction

The AWK-3131A 3-in-1 industrial wireless AP/bridge/client meets the growing need for faster data transmission speeds by supporting IEEE 802.11n technology with a net data rate of up to 300 Mbps. The AWK-3131A is compliant with industrial standards and approvals covering operating temperature, power input voltage, surge, ESD, and vibration. The two redundant DC power inputs increase the reliability of the power supply, and the AWK-3131A can be powered via PoE to make deployment easier. The AWK-3131A can operate on either the 2.4 or 5 GHz bands and is backwards-compatible with existing 802.11a/b/g deployments to future-proof your wireless investments.

Advanced 802.11n Industrial Wireless Solution

- 802.11a/b/g/n compliant AP/bridge/client for flexible deployment
- Software optimized for long distance (LoS, 1 km) wireless communication with external high-gain antenna (available on 5 GHz)
- Supports 60 clients connected concurrently
- DFS channel support allows a wider range of 5 GHz channel selection to avoid existing wireless infrastructure and interference

Advanced Wireless Technology

- Seamless roaming with Client-based Turbo Roaming for < 150 ms roaming recovery time between APs (Client mode)
- Supports AeroLink Protection for creating a redundant wireless link (< 300 ms recovery time) between AP and clients (Client mode)

Industrial Ruggedness

- Integrated antenna and power isolation designed to provide 500 V insulation protection against external electrical interference
- Hazardous location wireless communication with Class I Div II and ATEX Zone 2 certifications
- -40 to 75°C wide operating temperature models (-T) provided for smooth wireless communication in harsh environments

Specifications

WLAN Interface

Standards:
IEEE 802.11a/b/g/n for Wireless LAN
IEEE 802.11i for Wireless Security
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3ab for 1000BaseT
IEEE 802.3af for Power-over-Ethernet Plus
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN

Spread Spectrum and Modulation (typical):
• DSSS with DBPSK, DQPSK, CCK
• OFDM with BPSK, QPSK, 16QAM, 64QAM
• 802.11b: CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBPSK @ 1 Mbps
• 802.11a/g: 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps
• 802.11n: 64QAM @ 300 Mbps to BPSK @ 6.5 Mbps (multiple rates supported)

Operating Channels (central frequency):
US:
2.412 to 2.462 GHz (11 channels)
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5.260 to 5.320 GHz (4 channels)*
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• Firewall for MAC/IP/Protocol/Port-based filtering
• 64-bit and 128-bit WEP encryption, WPA/WPA2-Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP, and AES)
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Typ. 20±1.5 dBm @ 5.5 Mbps, Typ. 19±1.5 dBm @ 11 Mbps
802.11g:
Typ. 20±1.5 dBm @ 6 to 24 Mbps, Typ. 19±1.5 dBm @ 36 Mbps,
Typ. 18±1.5 dBm @ 48 Mbps, Typ. 17±1.5 dBm @ 54 Mbps
802.11n (2.4 GHz):
Typ. 20±1.5 dBm @ MCS0/8 20 MHz,
Typ. 16±1.5 dBm @ MCS7/15 20 MHz
Typ. 20±1.5 dBm @ MCS0/8 40 MHz,
Typ. 16±1.5 dBm @ MCS7/15 40 MHz
802.11a:
Typ. 20±1.5 dBm @ 6 to 24 Mbps, Typ. 19±1.5 dBm @ 36 Mbps,
Typ. 16±1.5 dBm @ 48 Mbps,Typ. 15±1.5 dBm @ 54 Mbps
802.11n (5 GHz):
Typ. 19±1.5 dBm @ MCS0/8 20 MHz,
Typ. 14±1.5 dBm @ MCS7/15 20 MHz
Typ. 18±1.5 dBm @ MCS0/8 40 MHz,
Typ. 14±1.5 dBm @ MCS7/15 40 MHz
Note: Based on regional regulations, the maximum transmission power allowed on the UNII bands is restricted in the firmware, as indicated below:

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-85 dBm @ 6 Mbps, -84 dBm @ 9 Mbps,
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-92 dBm @ 6 Mbps, -89 dBm @ 9 Mbps,
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Protocol Support

General Protocols: Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNTP, TCP, UDP, RADIUS, SNMP, DHCP, VLAN, STP/RSTP

Interface

Default Antennas: 2 dual-band omni-directional antennas, 2 dBi, RP-SMA (male)
Connector for External Antennas: RP-SMA (female), 500 V insulation
LAN Ports: 1, RJ45, 10/100/1000BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Console Port: RS-232 (RJ45-type)
Reset: Present
LED Indicators: PWR1, PWR2, PoE, FAULT, STATE, SIGNAL*, WLAN, LAN
*signal strength indicator
Alarm Contact (digital output): 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 electrically isolated inputs
• +13 to +30 V for state “1”
• +3 to -30 V for state “0”
• Max. input current: 8 mA

Management

Device Management: Wireless Search Utility, MXconfig, SNMP
Network Monitoring: MXview

Physical Characteristics

Housing: Metal, IP30 protection
Weight: 860 g (1.9 lb)
Dimensions: 52.7 x 135 x 105 mm (2.08 x 5.32 x 4.13 in)
Installation: DIN-rail mounting (standard), wall mounting (optional)

Environmental Limits

Operating Temperature:
Standard Models: -25 to 60°C (-13 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5% to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC, redundant dual DC power inputs or 48 VDC Power-over-Ethernet Plus (IEEE 802.3af compliant)
Input Current: 0.6 A @ 12 VDC;0.15 A @ 48 VDC
Connector: 10-pin removable terminal block, 500 V insulation
Power Consumption: 7.2 W
Reverse Polarity Protection: Present

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
Hazardous Location: UL/cUL Class I Division 2, ATEX Zone 2
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Radio: EN 301 489-1/17, EN 300 328, EN 301 893, TELEC, FCC ID SLE-WAPN005
Note: Please check Moxa’s website for the most up-to-date certification status.

MTBF (mean time between failures)

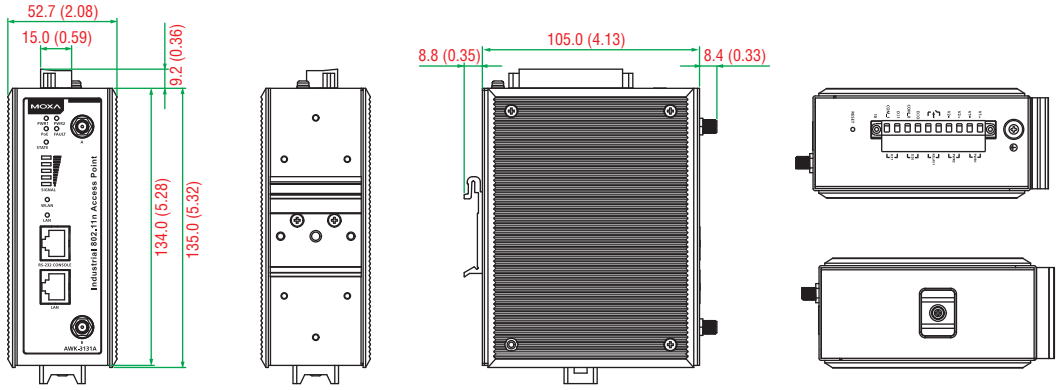
Time: 477,425 hrs
Standard: Telcordia SR332

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Front View | Rear View | Side View | Top & Bottom Views

Ordering Information

Available Models

AWK-3131A-US: IEEE 802.11a/b/g/n wireless AP/bridge/client, US band, -25 to 60°C operating temperature
AWK-3131A-US-T: IEEE 802.11a/b/g/n wireless AP/bridge/client, US band, -40 to 75°C operating temperature
AWK-3131A-EU: IEEE 802.11a/b/g/n wireless AP/bridge/client, EU band, -25 to 60°C operating temperature
AWK-3131A-EU-T: IEEE 802.11a/b/g/n wireless AP/bridge/client, EU band, -40 to 75°C operating temperature
AWK-3131A-JP: IEEE 802.11a/b/g/n wireless AP/bridge/client, JP band, -25 to 60°C operating temperature
AWK-3131A-JP-T: IEEE 802.11a/b/g/n wireless AP/bridge/client, JP band, -40 to 75°C operating temperature

Note: Please visit Moxa's website for a complete list of optional wireless accessories and antennas available for Moxa's wireless products.

Package Checklist

- AWK-3131A wireless AP/bridge/client
- 2 2.4/5 GHz antennas: ANT-WDB-ARM-02
- DIN-rail kit
- 2 plastic RJ45 protective caps
- Cable holder with one screw
- Quick installation guide (printed)
- Warranty card

AWK-4131A Series

Preliminary

Outdoor industrial IEEE 802.11a/b/g/n wireless AP/bridge/client

- IEEE 802.11a/b/g/n AP/bridge/client support
- Seamless roaming with Turbo Roaming
- Complete redundancy with AeroLink Protection
- Integrated antenna and power isolation
- Rugged IP68-rated housing and -40 to 75°C operating temperature
- 5 GHz DFS channel support

Introduction

The AWK-4131A IP68 outdoor industrial AP/bridge/client meets the growing need for faster data transmission speeds by supporting 802.11n technology and allowing 2X2 MIMO comunication with a net data rate of up to 300 Mbps. The AWK-4131A is compliant with industrial standards and approvals covering operating temperature, power input voltage, surge, ESD, and vibration. The two redundant DC power inputs increase the reliability of the power supply, and the AWK-4131A can be powered via PoE to make deployment easier. The AWK-4131A can operate on either the 2.4 or 5 GHz bands and is backwards-compatible with existing 802.11a/b/g deployments to future-proof your investments in wireless networks.

Advanced 802.11n Industrial Wireless Solution

- 802.11a/b/g/n compliant AP/bridge/client for flexible deployment
- Software optimized for long distance (LoS, 1 km) wireless communication with external high-gain antenna (available on 5 GHz)
- Supports 60 clients connected concurrently
- DFS channel support allows a wider range of 5 GHz channel selection to avoid existing wireless infrastructure and interference

Advanced Wireless Technology

- Seamless roaming with Client-based Turbo Roaming for < 150 ms roaming recovery time between APs (Client mode)
- Supports AeroLink Protection for creating a redundant wireless link (< 300 ms recovery time) between AP and clients (Client mode)

Industrial Ruggedness

- Integrated antenna and power isolation designed to provide 500 V insulation protection against external electrical interference
- IP68 rated metal casing for complete ingress protection for any outdoor weather
- -40 to 75°C wide operating temperature provided for smooth wireless communication in harsh environments

Specifications

WLAN Interface

Standards:
IEEE 802.11a/b/g/n for Wireless LAN
IEEE 802.11i for Wireless Security
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3ab for 1000BaseT
IEEE 802.3af for Power-over-Ethernet
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN

Spread Spectrum and Modulation (typical):
• DSSS with DBPSK, DQPSK, CCK
• OFDM with BPSK, QPSK, 16QAM, 64QAM
• 802.11b: CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBPSK @ 1 Mbps
• 802.11a/g: 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps
• 802.11n: 64QAM @ 300 Mbps to BPSK @ 6.5 Mbps (multiple rates supported)

Operating Channels (central frequency):
US:
2.412 to 2.462 GHz (11 channels)
5.180 to 5.240 GHz (4 channels)
5.260 to 5.320 GHz (4 channels)*
5.500 to 5.700 GHz (8 channels, excluding 5.600 to 5.640 GHz)*
5.745 to 5.825 GHz (5 channels)
EU:
2.412 to 2.472 GHz (13 channels)
5.180 to 5.240 GHz (4 channels)*
5.260 to 5.320 GHz (4 channels)
5.500 to 5.700 GHz (11 channels)*
JP:
2.412 to 2.484 GHz (14 channels)
5.180 to 5.240 GHz (4 channels)
5.260 to 5.320 GHz (4 channels)*
5.500 to 5.700 GHz (11 channels)*
*DFS (Dynamic Frequency Selection) channel support: In AP mode, when a radar signal is detected, the device will automatically switch to another channel. However according to regulations, after switching channels, a 60-second availability check period is required before starting the service.

Security:
• SSID broadcast enable/disable
• Firewall for MAC/IP/Protocol/Port-based filtering
• 64-bit and 128-bit WEP encryption, WPA/WPA2-Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP, and AES)
Transmission Rates:
802.11b: 1, 2, 5.5, 11 Mbps
802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11n: 6.5 to 300 Mbps (multiple rates supported)
TX Transmit Power:
802.11b:
Typ. 26±1.5 dBm @ 1 Mbps, Typ. 26±1.5 dBm @ 2 Mbps
Typ. 26±1.5 dBm @ 5.5 Mbps, Typ. 25±1.5 dBm @ 11 Mbps
802.11g:
Typ. 23±1.5 dBm @ 6 to 24 Mbps, Typ. 22±1.5 dBm @ 36 Mbps
Typ. 20±1.5 dBm @ 48 Mbps, Typ. 19±1.5 dBm @ 54 Mbps
802.11n (2.4 GHz):
Typ. 23±1.5 dBm @ MCS0/8 20 MHz,
Typ. 18±1.5 dBm @ MCS7/15 20 MHz
Typ. 23±1.5 dBm @ MCS0/8 40 MHz,
Typ. 17±1.5 dBm @ MCS7/15 40 MHz
802.11a:
Typ. 23±1.5 dBm @ 6 to 24 Mbps, Typ. 21±1.5 dBm @ 36 Mbps
Typ. 20±1.5 dBm @ 48 Mbps,Typ. 18±1.5 dBm @ 54 Mbps
802.11n (5 GHz):
Typ. 23±1.5 dBm @ MCS0/8 20 MHz,
Typ. 18±1.5 dBm @ MCS7/15 20 MHz
Typ. 23±1.5 dBm @ MCS0/8 40 MHz,
Typ. 18±1.5 dBm @ MCS7/15 40 MHz
Note: Based on regional regulations, the maximum transmission power allowed on the UNII bands is restricted in the firmware, as per the following list:

	US	EU	JP
2.4 GHz	20 dBm	20 dBm	20 dBm
5 GHz (UNII-1)	17 dBm	20 dBm	20 dBm
5 GHz (UNII-2)	20 dBm	20 dBm	20 dBm
5 GHz (UNII-2e)	20 dBm	20 dBm	20 dBm
5 GHz (UNII-3)	20 dBm	20 dBm	20 dBm

RX Receive Sensitivity:
802.11b:
-93 dBm @ 1 Mbps, -93 dBm @ 2 Mbps
-93 dBm @ 5.5 Mbps, -88 dBm @ 11 Mbps
802.11g:
-88 dBm @ 6 Mbps, -86 dBm @ 9 Mbps
-85 dBm @ 12 Mbps, -85 dBm @ 18 Mbps
-85 dBm @ 24 Mbps, -82 dBm @ 36 Mbps
-78 dBm @ 48 Mbps, -74 dBm @ 54 Mbps
802.11n (2.4 GHz):
-70 dBm @ MCS7 20 MHz, -69 dBm @ MCS15 20 MHz
-67 dBm @ MCS7 40 MHz, -67 dBm @ MCS15 40 MHz
802.11a:
-90 dBm @ 6 Mbps, -88 dBm @ 9 Mbps
-88 dBm @ 12 Mbps, -85 dBm @ 18 Mbps
-81 dBm @ 24 Mbps, -78 dBm @ 36 Mbps
-74 dBm @ 48 Mbps, -72 dBm @ 54 Mbps
802.11n (5 GHz):
-69 dBm @ MCS7 20 MHz, -71 dBm @ MCS15 20 MHz
-63 dBm @ MCS7 40 MHz, -68 dBm @ MCS15 40 MHz

Protocol Support
General Protocols: Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNTP, TCP, UDP, RADIUS, SNMP, DHCP, VLAN, STP/RSTP

Interface
Default Antennas: 2 dual-band omni-directional antennas, 5 dBi at 2.4 GHz, 2 dBi at 5 GHz, N-type (male)
Connector for External Antennas: N-Type (female), 500 V insulation
LAN Ports: 1, RJ45, 10/100/1000BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Console Port: RS-232 (waterproof RJ45-type)
Reset: Present
LED Indicators: PWR, FAULT, STATE, WLAN, LAN
Alarm Contact (digital output): 8-pin M12 A-coded connector (female), 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 8-pin M12 A-coded connector (female), 2 electrically isolated inputs
• +13 to +30 V for state “1”
• +3 to -30 V for state “0”
• Max. input current: 8 mA

Management
Device Management: Wireless Search Utility, MXconfig, SNMP
Network Monitoring: MXview

Physical Characteristics
Housing: Metal, IP68 protection
Weight: 1400 g (3.09 lb)
Dimensions: 224 x 148 x 67 mm (8.82 x 5.82 x 2.62 in)
Installation: Wall mounting (standard), DIN-rail mounting (optional), pole mounting (optional)

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5% to 95% (non-condensing)

Power Requirements
Input Voltage: 12 to 48 VDC, redundant dual DC power inputs or 48 VDC Power-over-Ethernet (IEEE 802.3af compliant)
Input Current: 0.64 A @ 12 VDC; 0.16 A @ 48 VDC
Connector: 5-pin M12 A-coded connector (male), 500 V insulation
Power Consumption: 7.68 W
Reverse Polarity Protection: Present

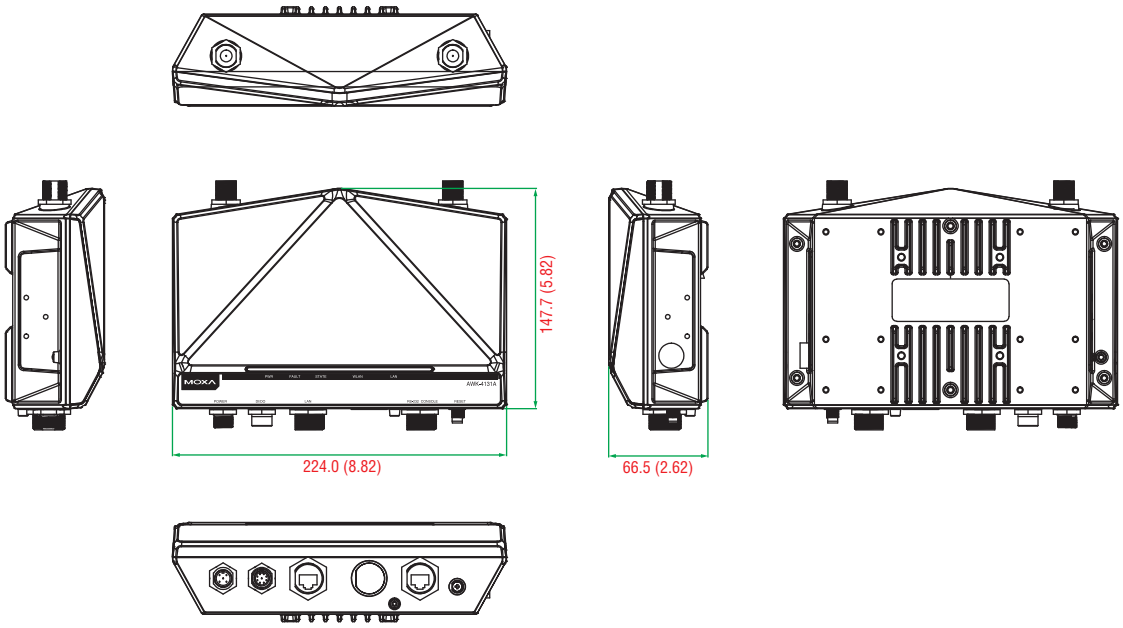
Standards and Certifications
Safety: UL 60950-1, EN 60950-1
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Radio: EN 301 489-1/17, EN 300 328, EN 301 893, TELEC, FCC ID SLE-WAPN008
Note: Please check Moxa’s website for the most up-to-date certification status.

MTBF (mean time between failures)
Time: 440,764 hrs
Standard: Telcordia SR332

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front, Top, and Rear Views | Side View | Bottom View

Ordering Information

Available Models

AWK-4131A-US-T: IEEE 802.11a/b/g/n IP68 wireless AP/bridge/client, US band, -40 to 75°C operating temperature

AWK-4131A-EU-T: IEEE 802.11a/b/g/n IP68 wireless AP/bridge/client, EU band, -40 to 75°C operating temperature

AWK-4131A-JP-T: IEEE 802.11a/b/g/n IP68 wireless AP/bridge/client, JP band, -40 to 75°C operating temperature

Note: Please visit Moxa's website for a complete list of optional wireless accessories and antennas available for Moxa's wireless products.

Package Checklist

- AWK-4131A wireless AP/bridge/client
- 2 2.4/5 GHz antennas: ANT-WDB-ANM-0502
- Wall-mounting kit (includes 2 supports)
- Field-installable power plug
- Field-installable RJ45 plug
- Metal cap to cover RJ45 connector
- Metal cap to cover M12-female connector
- Transparent plastic sticks for field-installable plugs
- Quick installation guide (printed)
- Warranty card

AWK-3191 Series

Industrial 900 MHz wireless AP/bridge/client

- 900 MHz transmission for long distance wireless communication
- AP/client and master/slave modes supported for point-to-point and point-to-multi-point connections
- Maximum security with WEP/WPA/WPA2/802.11X and powerful filters
- Integrated antenna and power isolation
- -40 to 75°C operating temperature range (T models)

Introduction

The AWK-3191 900 MHz wireless AP/bridge/client is Moxa's answer to long distance wireless communication for industrial applications. By combining the characteristics of the 33-centimeter band and the proven 802.11 standards, Moxa is able to provide a reliable long distance wireless solution. Unlike traditional point-to-point 900 MHz radios, the AWK-3191 supports both master/slave and AP/client operation modes to enable both point-to-point and point-to-multi-point communication for higher flexibility and lower total cost of ownership.

Furthermore, the AWK-3191 is designed to be deployed easily, but in case of external interference, Moxa also provides the ability to allow engineers to adjust their 900 MHz central frequency and bandwidth (5/10 MHz and 20 MHz) to optimize their wireless performance.

The AWK-3191 is rated to operate at temperatures ranging from -25 to 60°C for standard models and -40 to 75°C for wide temperature models, and with an industrial-oriented design, it is compliant with various standards and approvals, making it rugged enough for any harsh industrial environment.

Advanced Security

- Enable/disable SSID broadcasts
- WPA/WPA2 (Wi-Fi Protected Access) and 802.11i support
- IEEE 802.1X / RADIUS support
- MAC/IP/protocol/port filtering for applications that require more restricted access control

Specifications for Industrial-Grade Applications

- Long-distance data transmission over 30 km with directional antenna
- Power and antenna isolation design for a complete separation between system ground, chassis ground, and antenna system to protect against interference from unstable environmental factors
- Redundant DC power inputs
- Integrated DI/DO for on-site monitoring and warnings
- Signal strength LEDs for easy deployment and antenna alignment

Specifications

WLAN Interface

Standards:
IEEE 802.11i for Wireless Security
IEEE 802.1Q for VLAN
IEEE 802.3af for Power-over-Ethernet
Spread Spectrum and Modulation (typical):
• OFDM with BPSK, QPSK, 16QAM, 64QAM
• 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps
Operating Channels (central frequency):
US: 902 to 928 MHz (ISM band)
• 915 MHz (BW = 20 MHz)
• 908.5, 915, 921.5 MHz (BW = 10 MHz)
• 905.25, 908.5, 911.75, 915, 918.25, 921.5, 924.75 MHz (BW = 5 MHz)
Security:
• SSID broadcast enable/disable
• Firewall for MAC/IP/protocol/port-based filtering
• 64-bit and 128-bit WEP encryption, WPA/WPA2-Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP, and AES)

Transmission Rates:
6, 9, 12, 18, 24, 36, 48, 54 Mbps
TX Transmit Power:
Typ. 24±1.5 dBm @ 6 to 24 Mbps
Typ. 23±1.5 dBm @ 36 Mbps
Typ. 22±1.5 dBm @ 48 Mbps
Typ. 21±1.5 dBm @ 54 Mbps
RX Sensitivity:
-90 dBm @ 6 Mbps
-88 dBm @ 9 Mbps
-87 dBm @ 12 Mbps
-85 dBm @ 18 Mbps
-81 dBm @ 24 Mbps
-77 dBm @ 36 Mbps
-73 dBm @ 48 Mbps
-71 dBm @ 54 Mbps
Channel Band Width:
US: 5 MHz, 10 MHz, 20 MHz

Protocol Support

General Protocols: Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNTP, TCP, UDP, RADIUS, SNMP, DHCP, VLAN, STP/RSTP

Interface

Default Antennas: N/A, antenna purchase seperately
Connector for External Antennas: RP-SMA (female), 500 V insulation
LAN Ports: 1, RJ45, 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Console Port: RS-232 (RJ45-type)
Reset: Present
LED Indicators: PWR1, PWR2, PoE, FAULT, STATE, SIGNAL*, CLIENT MODE, BRIDGE MODE, WLAN, 10M, 100M
*signal strength indicator
Alarm Contact (digital output): 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 electrically isolated inputs
• +13 to +30 V for state "1"
• +3 to -30 V for state "0"
• Max. input current: 8 mA

Management

Device Management: Wireless Search Utility, SNMP

Physical Characteristics

Housing: Metal, IP30 protection
Weight: 930 g (2.05 lb)
Dimensions: 53 x 135 x 105 mm (2.08 x 5.31 x 4.13 in)
Installation: DIN-rail mounting (standard), wall mounting (optional)

Environmental Limits

Operating Temperature:
Standard Models: -25 to 60°C (-13 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5% to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC, redundant dual DC power inputs or 48 VDC Power-over-Ethernet (IEEE 802.3af compliant)
Input Current: 0.49 A @ 12 VDC; 0.12 A @ 48 VDC
Connector: 10-pin removable terminal block, 500 V insulation
Power Consumption: 5.76 W
Reverse Polarity Protection: Present

Standards and Certifications

Safety: UL 60950-1
EMI: CISPR 22, FCC Part 15B Class B
Radio: FCC ID SLE-WAFS001
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

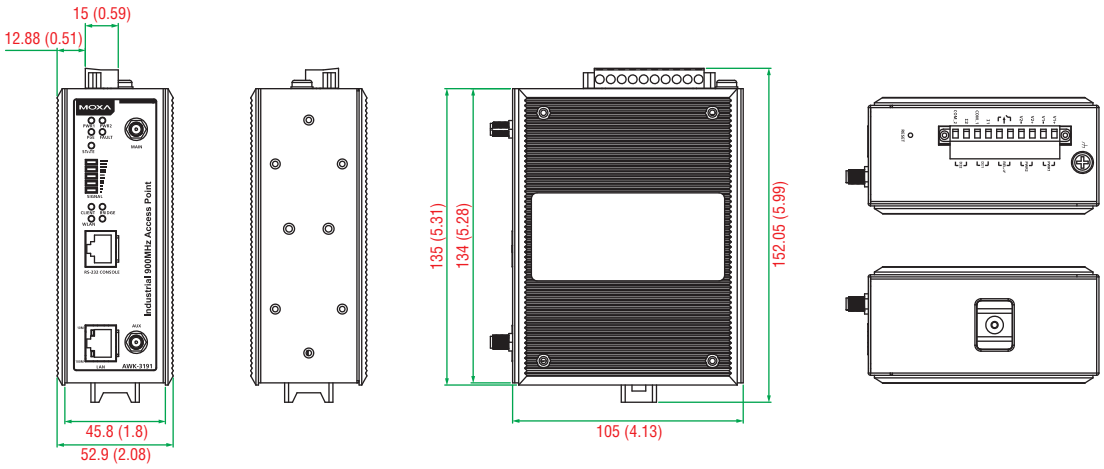
Time: 484,469 hrs
Standard: Telcordia SR332

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Front View | Side View | Rear View | Top & Bottom Views

Ordering Information

Available Models

AWK-3191-US: Industrial 900 MHz wireless AP/bridge/client, US band (902 to 928 MHz), -25 to 60°C operating temperature
AWK-3191-US-T: Industrial 900 MHz wireless AP/bridge/client, US band (902 to 928 MHz), -40 to 75°C operating temperature
Note: Moxa's AWK-3191 does NOT include default antennas; refer to the following information to choose a suitable antenna system

Optional Accessories (can be purchased separately)

A-CRF-RMNM-L1-X00: N-type (male) to RP SMA (male), LMR-195 Lite RF cable, available in lengths of 3 m, 6 m, and 9 m
ANT-WSB0.9-YNF-12: 900 MHz, Yagi antenna for point-to-point applications, 12 dBi, N-type (female)
ANT-WSB0.9-ANF-9: 900 MHz, omni-directional antenna for point-to-multi-point applications, 9 dBi, N-type (female)
Note: Please visit Moxa's website for a complete list of optional wireless accessories and antennas available for Moxa's wireless products.

Package Checklist

- AWK-3191 wireless AP/bridge/client
- DIN-rail kit
- 2 plastic RJ45 protective caps
- Cable holder with one screw
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

AWK-5232 Series

Industrial IEEE 802.11a/b/g/n dual-radio wireless AP/bridge/client

- IEEE 802.11a/b/g/n compliant
- Dual-radio design for 2.4 GHz and/or 5 GHz bands
- Redundant power inputs and PoE+
- Industrial grade QoS (WMM) and VLAN supported
- Supports client-based Turbo Roaming
- -40 to 75°C operating temperature range (T models)

Dual RF | Turbo Roaming | 802.11

Introduction

The AWK-5232 industrial a/b/g/n wireless AP/bridge/client is an ideal wireless solution for hard-to-wire situations and all mobile equipment that is connected over a TCP/IP network. It provides a faster connection and wider range than 802.11g models, with the connection noticeably stronger at a distance. With two independent RF modules, the AWK-5232 allows two independent wireless connections over different frequencies, and supports a great variety of wireless configurations and applications. The AWK-5232 is compliant with the industrial standards and approvals covering operating temperature, power input voltage, surge, ESD, and vibration. The AWK-5232's two DC power inputs increases the power supply's reliability, and can also be powered via PoE+ for easier deployment.

Higher Data Rate and Greater Bandwidth

- High-speed wireless connectivity with up to 300 Mbps data rate in each radio module
- MIMO technology improves data throughput via mulitplexed, smart antenna transmissions and receptions
- Channel bonding technology for increased throughput or channel redundancy
- Dual DC power inputs and PoE+
- Immunity against disconnection caused by radio interference

Specifications for Higher Security

- 64-bit and 128-bit WEP (Wired Equivalent Privacy)
- Enable/disable SSID broadcasts
- Power filters for access control
- IEEE/802.11X/RADIUS supported
- WPA/WPA2/802.11i supported

Specifications

WLAN Interface

Standards:
IEEE 802.11a/b/g/n for Wireless LAN
IEEE 802.11i for Wireless Security
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseTX
IEEE 802.3ab for 1000BaseT
IEEE 802.3at for Power-over-Ethernet Plus
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN
Spread Spectrum and Modulation (typical):
• DSSS with DBPSK, DQPSK, CCK
• OFDM with BPSK, QPSK, 16QAM, 64QAM
• 802.11b: CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBPSK @ 1 Mbps
• 802.11a/g: 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps
• 802.11n: 64QAM @ 300 Mbps to BPSK @ 6.5 Mbps (multiple rates supported)
Operating Channels (central frequency):
US:
2.412 to 2.462 GHz (11 channels)
5.18 to 5.24 GHz (4 channels)
EU:
2.412 to 2.472 GHz (13 channels)
5.18 to 5.24 GHz (4 channels)
JP:
2.412 to 2.472 GHz (13 channels, OFDM)
2.412 to 2.484 GHz (14 channels, DSSS)
5.18 to 5.24 GHz (4 channels for W52)
Security:
• SSID broadcast enable/disable
• Firewall for MAC/IP/Protocol/Port-based filtering
• 64-bit and 128-bit WEP encryption, WPA/WPA2-Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP, and AES)
Transmission Rates:
802.11b: 1, 2, 5.5, 11 Mbps
802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11n: 6.5 to 300 Mbps (multiple rates supported)
TX Transmit Power:
802.11b:
Typ. 18±1.5 dBm @ 1 to 11 Mbps
802.11g:
Typ. 18±1.5 dBm @ 6 to 24 Mbps,
Typ. 17±1.5 dBm @ 36 to 48 Mbps,
Typ. 15±1.5 dBm @ 54 Mbps
802.11n (2.4 GHz):
Typ. 14±1.5 dBm @ MCS15 20 MHz
802.11a:
Typ. 17±1.5 dBm @ 6 to 24 Mbps,
Typ. 16±1.5 dBm @ 36 to 48 Mbps,
Typ. 14±1.5 dBm @ 54 Mbps
802.11n (5 GHz):
Typ. 13±1.5 dBm @ MCS15 20 MHz,
Typ. 12±1.5 dBm @ MCS15 40 MHz

RX Receive Sensitivity:
802.11b:
-92 dBm @ 1 Mbps, -90 dBm @ 2 Mbps,
-88 dBm @ 5.5 Mbps, -84 dBm @ 11 Mbps
802.11g:
-87 dBm @ 6 Mbps, -86 dBm @ 9 Mbps,
-85 dBm @ 12 Mbps, -82 dBm @ 18 Mbps,
-80 dBm @ 24 Mbps, -76 dBm @ 36 Mbps,
-72 dBm @ 48 Mbps, -70 dBm @ 54 Mbps
802.11n (2.4 GHz):
-69 dBm @ MCS15 20 MHz,
-71 dBm @ MCS7 20 MHz
802.11a:
-87 dBm @ 6 Mbps, -86 dBm @ 9 Mbps,
-85 dBm @ 12 Mbps, -82 dBm @ 18 Mbps,
-80 dBm @ 24 Mbps, -76 dBm @ 36 Mbps,
-72 dBm @ 48 Mbps, -70 dBm @ 54 Mbps
802.11n (5 GHz):
-68 dBm @ MCS15 40 MHz, -69 dBm @ MCS15 20 MHz,
-70 dBm @ MCS7 40 MHz, -71 dBm @ MCS7 20 MHz

Protocol Support

General Protocols: Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNTP, TCP, UDP, RADIUS, SNMP, DHCP, VLAN, STP/RSTP

Interface

Default Antennas: 4 dual-band omni-directional antennas, 2 dBi, RP-SMA (male)
Connector for External Antennas: RP-SMA (female)
LAN Ports: 2, RJ45, 10/100/1000BaseT(X), auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Console Port: RS-232 (RJ45-type)
Reset: Present
LED Indicators: PWR1, PWR2, PoE+, FAULT, STATE, WLAN1, WLAN2, 100M, 1000M
Alarm Contact (digital output): 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 electrically isolated inputs
• +13 to +30 V for state "1"
• +3 to -30 V for state "0"
• Max. input current: 8 mA

Management

Device Management: Wireless Search Utility, SNMP

Physical Characteristics

Housing: Metal, IP30 protection
Weight: 1320 g (2.91 lb)
Dimensions: 75 x 135 x 105 mm (2.9 x 5.3 x 4.1 in)
Installation: DIN-rail mounting (standard), wall mounting (optional)

Environmental Limits

Operating Temperature:
Standard Models: -25 to 60°C (-13 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5% to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC, redundant dual DC power inputs or 48 VDC Power-over-Ethernet Plus (IEEE 802.3at compliant)
Input Current: 1.5 A @ 12 VDC
Connector: 10-pin removable terminal block
Power Consumption: 18 W
Reverse Polarity Protection: Present

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 3 V
IEC 61000-4-8
Radio: EN 301 489-1/17, EN 300 328, EN 301 893, TELEC, FCC ID SLE-WAPN001
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

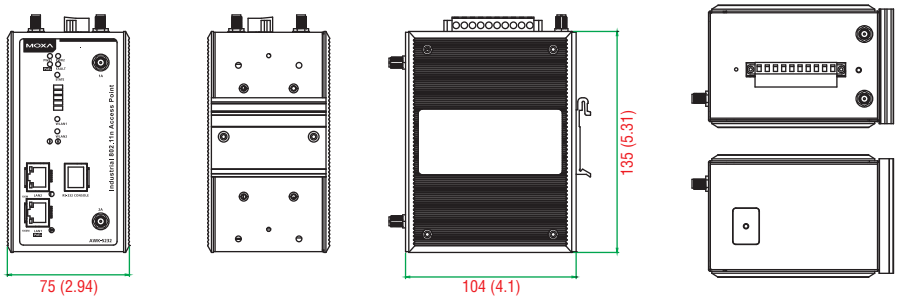
Time: 290,422 hrs
Standard: Telcordia SR332

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Front View | Rear View | Side View | Top & Bottom Views

Ordering Information

Available Models

AWK-5232-US: IEEE 802.11a/b/g/n dual-radio wireless AP/bridge/client, US band, -25 to 60°C operating temperature
AWK-5232-US-T: IEEE 802.11a/b/g/n dual-radio wireless AP/bridge/client, US band, -40 to 75°C operating temperature
AWK-5232- EU: IEEE 802.11a/b/g/n dual-radio wireless AP/bridge/client, EU band, -25 to 60°C operating temperature
AWK-5232- EU -T: IEEE 802.11a/b/g/n dual-radio wireless AP/bridge/client, EU band, -40 to 75°C operating temperature
AWK-5232-JP: IEEE 802.11a/b/g/n dual-radio wireless AP/bridge/client, JP band, -25 to 60°C operating temperature
AWK-5232-JP-T: IEEE 802.11a/b/g/n dual-radio wireless AP/bridge/client, JP band, -40 to 75°C operating temperature
Note: Please visit Moxa's website for a complete list of optional wireless accessories and antennas available for Moxa's wireless products.

Package Checklist

- AWK-5232 wireless AP/bridge/client
- 4 2.4/5 GHz antennas: ANT-WDB-ARM-02
- DIN-rail kit
- 2 plastic RJ protective caps for LAN and Console ports
- Cable holder with 1 screw
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

AWK-6232 Series

Outdoor industrial IEEE 802.11a/b/g/n dual-radio wireless AP/bridge/client

- IEEE 802.11a/b/g/n compliant
- Dual-radio design for 2.4 GHz and/or 5 GHz bands
- M12 anti-vibration connectors
- Industrial grade QoS (WMM) and VLAN supported
- Supports client-based Turbo Roaming
- Rugged IP68-rated housing and -40 to 75°C operating temperature

Introduction

Moxa's AWK-6232 3-in-1 outdoor wireless AP/bridge/client meets the growing need for faster data transmission speeds and wider coverage by supporting IEEE 802.11n technology with a net data rate of up to 300 Mbps for each radio module. The AWK-6232 provides a flexible and efficient way to deploy your wireless network with its dual 2.4/5 GHz RF modules, which allow two independent wireless connections over different frequencies. The AWK-6232 is compliant with the industrial standards and approvals covering operating temperature, power input voltage, surge, ESD, and vibration. In addition, the AWK-6232 is housed in an IP68 metal casing with M12 connectors for total protection against dust, water, vibration, and other environmental effects.

Improved Higher Data Rate and Bandwidth

- High-speed wireless connectivity with up to 300 Mbps data rate for each radio module
- MIMO technology to improve the capacity of multiple data stream transmits and receives
- Increased channel width with channel bonding technology

Features for Critical Environments

- IP68-rated metal housing and -40 to 75°C wide operating temperature
- Anti-vibration M12 design and waterproof/dust-tight RJ45 connectors
- Wall, DIN-rail, and pole-mounting options for versatile outdoor installation

Specifications

WLAN Interface

Standards:
IEEE 802.11a/b/g/n for Wireless LAN
IEEE 802.11i for Wireless Security
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseTX
IEEE 802.3ab for 1000BaseT
IEEE 802.3at for Power-over-Ethernet Plus
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q VLAN
Spread Spectrum and Modulation (typical):
• DSSS with DBPSK, DQPSK, CCK
• OFDM with BPSK, QPSK, 16QAM, 64QAM
• 802.11b: CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBPSK @ 1 Mbps
• 802.11a/g: 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps
• 802.11n: 64QAM @ 300 Mbps to BPSK @ 6.5 Mbps (multiple rates supported)
Operating Channels (central frequency):
US:
2.412 to 2.462 GHz (11 channels)
5.18 to 5.24 GHz (4 channels)
EU:
2.412 to 2.472 GHz (13 channels)
5.18 to 5.24 GHz (4 channels)
JP:
2.412 to 2.472 GHz (13 channels, OFDM)
2.412 to 2.484 GHz (14 channels, DSSS)
5.18 to 5.24 GHz (4 channels for W52)

Security:
• SSID broadcast enable/disable
• Firewall for MAC/IP/Protocol/Port-based filtering
• 64-bit and 128-bit WEP encryption, WPA/WPA2-Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP, and AES)
Transmission Rates:
802.11b: 1, 2, 5.5, 11 Mbps
802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11n: 6.5 to 300 Mbps (multiple rates supported)
TX Transmit Power:
802.11b:
Typ. 18±1.5 dBm @ 1 to 11 Mbps
802.11g:
Typ. 18±1.5 dBm @ 6 to 24 Mbps,
Typ. 17±1.5 dBm @ 36 to 48 Mbps,
Typ. 15±1.5 dBm @ 54 Mbps
802.11n (2.4 GHz):
Typ. 14±1.5 dBm @ MCS15 20 MHz
802.11a:
Typ. 17±1.5 dBm @ 6 to 24 Mbps,
Typ. 16±1.5 dBm @ 36 to 48 Mbps,
Typ. 14±1.5 dBm @ 54 Mbps
802.11n (5 GHz):
Typ. 13±1.5 dBm @ MCS15 20 MHz,
Typ. 12±1.5 dBm @ MCS15 40 MHz
RX Receive Sensitivity:
802.11b:
-92 dBm @ 1 Mbps, -90 dBm @ 2 Mbps,
-88 dBm @ 5.5 Mbps, -84 dBm @ 11 Mbps

802.11g:
-87 dBm @ 6 Mbps, -86 dBm @ 9 Mbps,
-85 dBm @ 12 Mbps, -82 dBm @ 18 Mbps,
-80 dBm @ 24 Mbps, -76 dBm @ 36 Mbps,
-72 dBm @ 48 Mbps, -70 dBm @ 54 Mbps
802.11n (2.4 GHz):
-69 dBm @ MCS15 20 MHz,
-71 dBm @ MCS7 20 MHz
802.11a:
-87 dBm @ 6 Mbps, -86 dBm @ 9 Mbps,
-85 dBm @ 12 Mbps, -82 dBm @ 18 Mbps,
-80 dBm @ 24 Mbps, -76 dBm @ 36 Mbps,
-72 dBm @ 48 Mbps, -70 dBm @ 54 Mbps
802.11n (5 GHz):
-68 dBm @ MCS15 40 MHz, -69 dBm @ MCS15 20 MHz,
-70 dBm @ MCS7 40 MHz, -71 dBm @ MCS7 20 MHz

Protocol Support

General Protocols: Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNTP, TCP, UDP, RADIUS, SNMP, DHCP, VLAN, STP/RSTP

Interface

Default Antennas: 4 dual-band omni-directional antennas, 5 dBi at 2.4 GHz, 2 dBi at 5 GHz, N-type (male)
Connector for External Antennas: N-type (female)
LAN Ports: 2, 8-pin M12 A-coded (female), 10/100/1000BaseT(X), auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection (female)
Console Port: RS-232 (waterproof RJ45-type)
Reset: Present
LED Indicators: PWR, FAULT, STATE, WLAN1, WLAN2, LAN1, LAN2
Alarm Contact (digital output): 8-pin M12 A-coded (male), 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 8-pin M12 A-coded (male), 2 electrically isolated inputs
• +13 to +30 V for state "1"
• +3 to -30 V for state "0"
• Max. input current: 8 mA

Management

Device Management: Wireless Search Utility, SNMP

Physical Characteristics

Housing: Metal, IP68 protection
Weight: 1699 g (3.75 lb)
Dimensions: 224 x 148 x 67 mm (8.82 x 5.82 x 2.62 in)
Installation: Wall mounting (standard), DIN-rail mounting (optional), pole mounting (optional)

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5% to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC, redundant dual DC power inputs or 48 VDC Power-over-Ethernet plus (IEEE 802.3at compliant)
Input Current: 1.5 A @ 12 VDC
Connector: 5-pin M12 A-coded (male)
Power Consumption: 18 W
Reverse Polarity Protection: Present

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Radio: EN 301 489-1/17, EN 300 328, EN 301 893, TELEC, FCC ID SLE-WAPN001
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

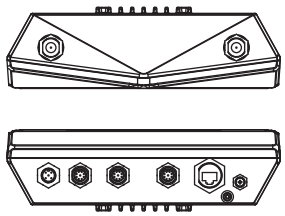
Time: 317,948 hrs
Standard: Telcordia SR332

Warranty

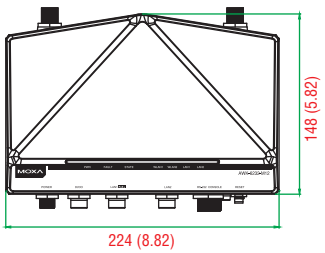
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

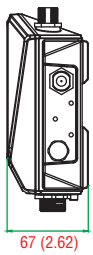
Unit: mm (inch)



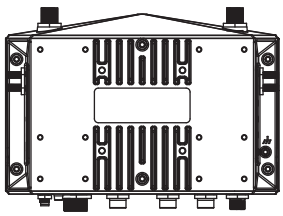
Top & Bottom Views



Front View



Side Views



Rear View

Ordering Information

Available Models

AWK-6232-M12-US-T: IEEE 802.11a/b/g/n IP68 dual-radio wireless AP/bridge/client, US band, -40 to 75°C operating temperature
AWK-6232-M12-EU-T: IEEE 802.11a/b/g/n IP68 dual-radio wireless AP/bridge/client, EU band, -40 to 75°C operating temperature
AWK-6232-M12-JP-T: IEEE 802.11a/b/g/n IP68 dual-radio wireless AP/bridge/client, JP band, -40 to 75°C operating temperature
Note: Please visit Moxa's website for a complete list of optional wireless accessories and antennas available for Moxa's wireless products.

Package Checklist

- AWK-6232 wireless AP/bridge/client
- 4 2.4/5 GHz antennas: ANT-WDB-ANM-0502
- Wall-mounting kit (includes 2 supports)
- Field-installable power plug
- Field-installable Ethernet plug
- 1 metal cap to cover RJ45 connector
- 1 metal cap to cover M12-female LAN connector
- 1 metal cap to cover M12-male DI/O connector
- 2 transparent plastic sticks for field-installable plugs
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Wireless Antenna Selection Guide

	IEEE 802.11b/g 2.4 GHz Wireless Antennas				IEEE 802.11a 5 GHz Wireless Antennas	
	ANT-WSB-AHRM-05-1.5m	ANT-WSB-ANF-09	ANT-WSB-PNF-12	ANT-WSB-PNF-18	ANT-WSB5-ANF-12	ANT-WSB5-PNF-18
Frequency Range	2.4 to 2.5 GHz				5.1 to 5.9 GHz	
Antenna Type	Omni-directional, λ/4 Dipole	Omni-directional, Dipole	Directional, Panel	Directional, Panel	Omni-directional	Directional, Panel
Typical Antenna Gain	1.5 dBi	9 dBi	12 dBi	18 dBi	12 dBi	18 dBi
Description	2.4 GHz, omni-directional/ dipole antenna, 5 dBi, RP-SMA (male)	2.4 GHz, Dipole antenna, 9 dBi, N-type (female)	2.4 GHz, panel antenna, 12 dBi, N-type (female)	2.4 GHz, panel antenna, 18 dBi, N-type (female)	5 GHz, Dipole antenna, 12 dBi, N-type (female)	5 GHz, panel antenna, 18 dBi, N-type (female)
Impedance	50 ± 5 ohms	50 ± 5 ohms	50 ± 5 ohms	50 ± 5 ohms	50 ± 5 ohms	50 ± 5 ohms
Polarization	Linear	Linear	Linear	Linear	Linear	Linear
HPBW/Horizontal	360°	360°	50°	30°	360°	10°
HPBW/Vertical	80°	10°	30°	20°	6°	10°
V.S.W.R.	2.0	1:1.3 Max.	1:1.5 Max.	1:1.5 Max.	1:1.3 Max.	1:1.5 Max.
Power Handling	–	15 W Max.	10 W Max.	15 W Max.	10 W Max.	10 W Max.
Connector(s)	RP-SMA (male)	N-type (female)	N-type (female)	N-type (female)	N-type (female)	N-type (female)
Operating Temperature	-40 to 80°C (-40 to 176°F)	-40 to 80°C (-40 to 176°F)	-40 to 80°C (-40 to 176°F)	-40 to 80°C (-40 to 176°F)	-40 to 80°C (-40 to 176°F)	-40 to 80°C (-40 to 176°F)
IP rating	–	IP65	IP65	IP65	IP65	IP65
Antenna Profile	–	Length: 420 mm (16.54 in)	215 x 90 x 30 mm (8.46 x 3.54 x 1.18 in)	270 x 205 x 15 mm (10.63 x 8.07 x 0.59 in)	Length: 420 mm (16.54 in)	270 x 205 x 15 mm (10.63 x 8.07 x 0.59 in)
Weight	300 g (0.66 lb)	430 g (0.95 lb)	560 g (1.23 lb)	310 g (0.68 lb)	430 g (0.95 lb)	990 g (2.18 lb)

	IEEE 802.11a/b/g 2.4/5 GHz Dual-band Antennas							900 MHz Antennas	
	ANT-WDB-ARM-02	ANT-WDB-ANM-0502	ANT-WDB-ANM-0407	ANT-WDB-ANF-0407	ANT-WDB-ANM-0609	ANT-WDB-ANF-0609	ANT-WDB-PNF-1518	ANT-WSB0.9-ANF-09 (Available in US and ANZ Regions Only)	ANT-WSB0.9-YNF-12 (Available in US and ANZ Regions Only)
Frequency Range	2.4 to 2.5 and 5.2 to 5.8 GHz	2.4 to 2.5 / 5.1 to 5.9 GHz						902 to 928 MHz	902 to 928 MHz
Antenna Type	Omni-directional	Omni-directional, Dipole	Omni-directional, Dipole	Omni-directional, Dipole	Omni-directional, Dipole	Omni-directional	Directional, Panel	Omni-directional	Directional Yagi type
Typical Antenna Gain	2 dBi	5/2 dBi	4/7 dBi	4/7 dBi	6/9 dBi	6/9 dBi	15/18 dBi, Dipole	9 dBi	12 dBi
Description	2.4/5.5 GHz 2 dBi dual-band antenna, RP-SMA (male) connector	2.4/5 GHz, dual-band omni-directional antenna, 5/2 dBi, N-type (male)	2.4/5 GHz, dual-band omni-directional antenna, 4/7 dBi, N-type (male)	2.4/5 GHz, dual-band omni-directional antenna, 4/7 dBi, N-type (female)	2.4/5 GHz, dual-band omni-directional antenna, 6/9 dBi, N-type (male)	2.4/5 GHz, dual-band omni-directional antenna, 6/9 dBi, N-type (female)	2.4/5 GHz, dual-band panel antenna, 15/18 dBi, N-type (female)	900 MHz, omni-directional antenna, 9 dBi, N-type (female)	900 MHz, Yagi directional antenna, 12 dBi, N-type (female)
Impedance	50±5 ohms	50 ± 5 ohms	50 ± 5 ohms	50 ± 5 ohms	50 ± 5 ohms	50 ± 5 ohms	50 ± 5 ohms	50±5 ohms	50±5 ohms
Polarization	Linear, Vertical	Linear	Linear	Linear	Linear	Linear	Linear	Linear	Linear
HPBW/Horizontal	360°	360°	360°	360°	360°	360°	50/10°	360°	25°
HPBW/Vertical	80°	65°	10/8°	10/8°	10/8°	10/8°	30/10°	11°	15°
V.S.W.R.	1:2.0 Max.	1:2.0 Max.	1:1.5 Max.	1:1.5 Max.	1:1.5 Max.	1:1.5 Max.	1:1.5 Max.	1:1.5 Max.	1:1.5 Max.
Power Handling	–	2 W Max.	10 W Max.	10 W Max.	10 W Max.	10 W Max.	20 W Max.	50 W Max.	30 W Max.
Connector(s)	RP-SMA (male)	N-type (male)	N-type (male)	N-type (female)	N-type (male)	N-type (female)	N-type (female)	N-type (female)	N-type (female)
Operating Temperature	-40 to 80°C (-40 to 176°F)	-40 to 80°C (-40 to 176°F)	-40 to 80°C (-40 to 176°F)	-40 to 80°C (-40 to 176°F)	-40 to 80°C (-40 to 176°F)	-40 to 80°C (-40 to 176°F)	-40 to 80°C (-40 to 176°F)	-40 to 80°C (-40 to 176°F)	-40 to 80°C (-40 to 176°F)
IP rating	–	IP67	IP65	IP65	IP65	IP65	IP65	IP65	IP65
Antenna Profile	Length: 108 mm (4.25 in)	Length: 220 mm (8.66 in)	Length: 220 mm (8.66 in)	Length: 238 mm (9.37 in)	Length: 632 mm (24.88 in)	Length: 660 mm (25.98 in)	270 x 205 x 15 mm (10.63 x 8.07 x 0.59 in)	Diameter: 51 mm (2.01 in); Length: 1,470 mm (57.87 in)	Length: 1400 mm (55.11 in)
Weight	10 g (0.02 lb)	72 g (0.16 lb)	115 g (0.95 lb)	297 g (0.65 lb), incl. antenna holder	238 g (0.52 lb)	286 g (0.63 lb)	1020±10 g (2.25±0.02 lb)	716 g (1.58 lb)	570 g (1.26 lb)

Wireless Accessories Selection Guide

	Cables										
	CRF-N0117SA-3M	CRF-N0429N-3M	A-CRF-NMNM-LL4-300	A-CRF-NMNM-LL4-600	A-CRF-NMNM-LL4-900	A-CRF-RMNM-L1-300	A-CRF-RMNM-L1-600	A-CRF-RMNM-L1-900	A-CRF-RFRM-S1-060	A-CRF-QMAMNM-R2-50	A-CRF-RFQMAM-R2-50
Description	CFD200 cable, N-type (male) to RP SMA (male), 3 m	CFD400 cable, N-type (male) to N-type (male), 3 m	LMR-400 Lite cable, N-type (male) to N-type (male), 3 m	LMR-400 LITE cable, N-type (male) to N-type (male), 6 m	LMR-400 LITE cable, N-type (male) to N-type (male), 9 m	LMR-195 Lite cable, N-type (male) to RP SMA (male), 3 m	LMR-195 Lite cable, N-type (male) to RP SMA (male), 6 m	LMR-195 Lite cable, N-type (male) to RP SMA (male), 9 m	S141 cable, RP-SMA (male) to RP-SMA (female), 0.6 m	RG316 cable, QMA (male) to N-type (male)	RG316 cable, QMA (male) to RP-SMA (female)
Cable Type	CFD200	CFD400	LMR-400 Lite	LMR-400 Lite	LMR-400 Lite	LMR-195 Lite	LMR-195 Lite	LMR-195 Lite	S141	RG316	RG316
Connector Type	N-type male to RP SMA male	N-type male to N-type male	N-type male to N-type male	N-type male to N-type male	N-type male to N-type male	N-type male to RP SMA male	N-type male to RP SMA male	N-type male to RP SMA male	RP-SMA male to RP-SMA female	QMA male to N-type male	QMA male to RP-SMA female
Cable Length	3 m (118.11 in)	3 m (118.11 in)	3 m (118.11 in)	6 m (236.22 in)	9 m (354.33 in)	3 m (118.11 in)	6 m (236.22 in)	9 m (354.33 in)	0.6 m (23.62 in)	0.5 m (19.69 in)	0.5 m (19.69 in)
Outer Dimension	5 mm (0.20 in)	10.3 mm (0.41 in)	10.29 mm (0.41 in)	10.29 mm (0.41 in)	10.29 mm (0.41 in)	4.95 mm (0.20 in)	4.95 mm (0.20 in)	4.95 mm (0.20 in)	5 mm (0.20 in)	2.54 mm (0.10 in)	2.54 mm (0.10 in)
Min. Bend Radius	12.7 mm (0.5 in)	24.5 mm (0.96 lb)	25.4 mm (1 in)	25.4 mm (1 in)	25.4 mm (1 in)	12.7 mm (0.5 in)	12.7 mm (0.5 in)	12.7 mm (0.5 in)	12.7 mm (0.5 in)	15 mm (0.59 in)	15 mm (0.59 in)
Attenuation (dB/100 m)	55.4@2.5 GHz 86.5@5.8 GHz	22.2@2.5 GHz 35.5@5.8 GHz	22.2@2.5 GHz 35.5@5.8 GHz	22.2@2.5 GHz 35.5@5.8 GHz	22.2@2.5 GHz 35.5@5.8 GHz	62.4@2.5 GHz 98.1@5.8 GHz	62.4@2.5 GHz 98.1@5.8 GHz	62.4@2.5 GHz 98.1@5.8 GHz	75.4@3 GHz 98.4@5 GHz	206@2.4 GHz 345@6 GHz	206@2.4 GHz 345@6 GHz
Related Products	AWK-1131A, AWK-3131A, AWK-3191, AWK-5232, AWK-3121-SSC-RTG	AWK-4131A, AWK-6232-M12, TAP-6226				AWK-1131A, AWK-3131A, AWK-3191, AWK-5232, AWK-3121-SSC-RTG				AWK-3121-M12-RTG, AWK-3131-RCC, AWK-5232-RCC	

	Termination Resistors	
	A-TRM-50-NM	A-TRM-50-RM
Description	Termination resistor, 50 ohms, N-type (male)	Termination resistor, 50 ohms, RP-SMA (male)
Related Products	AWK-4131A, AWK-6232, TAP-6226	AWK-1131A, AWK-3131A, AWK-3191, AWK-5232, AWK-3121-SSC-RTG

	Arrestors	
	A-SA-NMNF-01	A-SA-NFNF-01
Frequency	0-6 GHz	0-6 GHz
Connector Type	N-type female to N-type male	N-type female to N-type female

	Adaptors	
	A-ADP-RJ458P-DB9F-ABC01	A-ADP-QMAM-RF
Description	RJ45-to-DB9 adaptor for the ABC-01	QMA(male) to RP-SMA (female) adaptor for antenna
Related Products	All AWK series	AWK-3121-M12-RTG, AWK-3131-RCC, AWK-5232-RCC

Note: Actual products may vary in physical appearance but functionality will not be affected.

Industrial Cellular Solutions

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Industrial Cellular Solutions

Cellular Routers & LTE Cellular Gateway

	Cellular Router			Cellular Advanced IP Gateway
	WDR-3124A	OnCell 5004-HSPA	OnCell 5104-HSPA	OnCell G3470A-LTE
Cellular Interface				
Standards	GSM/GPRS/EDGE/UMTS/HSPA			GSM/GPRS/EDGE/UMTS/HSPA/LTE
4G Band Options	–	–	–	EU model: 2100/1800/2600/900/800 MHz (B1/B3/B7/B8/B20) US model:1900/AWS/850/700/700/1900 MHz (B2/B4/B5/B13/B17/B25)
LTE Data Rate	–	–	–	20 MHz bandwidth: 100 Mbps DL, 50 Mbps UL 10 MHz bandwidth: 50 Mbps DL, 25 Mbps UL
3G Band Options	800/850/900/1900/2100 MHz	800/850/AWS/1900/2100 MHz		EU model: 800/850/900/1900/2100 MHz US model: 850/900/AWS/1900/2100 MHz
HSPA Data Rate	14.4 Mbps DL, 5.76 Mbps UL (Category 6, 7)	14.4 Mbps DL, 5.76 Mbps UL		42 Mbps DL, 5.76 Mbps UL (Category 24, 6)
2G Band Options	850/900/1800/1900 MHz			850/900/1800/1900 MHz
EDGE Data Rate	237 kbps DL, 237 kbps UL (Class 12)	237 kbps DL, 237 kbps UL		237 kbps DL, 237 kbps UL (Class 10, 12)
GPRS Data Rate	85.6 kbps DL, 85.6 kbps UL	85.6 kbps DL, 85.6 kbps UL		85.6 kbps DL, 42.8 kbps UL
Ethernet WAN Interface				
Number of Ports	–	1		–
Ethernet	–	10/100M (RJ45)		–
Wireless Interface				
Standards	802.11a/b/g/n	–	–	–
Number of RF Modules	1	–	–	–
LAN Interface				
Number of Ports	4			4
Ethernet	10/100/1000M (RJ45)	10/100M (RJ45)		10/100/1000M (RJ45)
SIM Interface				
Number of SIMs	2			
SIM Control	3 V			
I/O Interface				
Alarm Contacts	1	–	1	1
Digital Inputs	2	–	2	2
Software				
Protocols	ICMP, DDNS, TCP/IP, UDP, DHCP, Telnet, DNS, SNMP, HTTP, HTTPS, SMTP, SNTP, ARP	ARP, DDNS, DHCP/BOOTP, DNS Relay, HTTP, HTTPS, ICMP, IPSec, PPP, PPPoE, SMTP, SNTP, SSH, SSL, TCP/IP, Telnet, UDP		ICMP, DDNS, TCP/IP, UDP, DHCP, Telnet, DNS, SNMP, HTTP, HTTPS, SMTP, SNTP, ARP
Routing/Firewall	NAT, port forwarding, IP/MAC/Port filtering	NAT, port forwarding, WAN IP filtering, static route		NAT, port forwarding, IP/MAC/Port filtering
Virtual Private Network	• Max. Tunnel Number: 5 (Responder/ Initiator) • IPSec (DES, 3DES, AES, MD5, SHA-1, DH2, DH5), PSK/X.509/RSA	IPSec (DES, 3DES, AES, MD5, SHA-1, SH1, DH2, DH5), PSK		• Max. Tunnel Number: 5 (Responder/ Initiator) • IPSec (DES, 3DES, AES, MD5, SHA-1, DH2, DH5), PSK/X.509/RSA
Cellular Connectivity	GuaranLink			
Utilities	OnCell Central Manager, Wireless Search Utility, SNMP v1/v2/v3, Web/Telnet/Serial Console, SSH, Remote SMS Control, Auto IP Report			
Physical Characteristics				
Housing	Aluminum (IP30)			
Weight	1280 g (2.82 lb)	510 g (1.12 lb)	650 g (1.43 lb)	1300 g (2.87 lb)
Dimensions	66.3 X 124 X 90 mm (2.61 x 4.88 x 3.54 in)	158 x 103 x 35 mm (6.22 x 4.06 x 1.38 in)	51 x 135 x 103 mm (2 x 5.32 x 4.16 in)	66.3 x 124 x 90 mm (2.61 x 4.88 x 3.54 in)
Environmental Limits				
Operating Temperature	Standard Models: 0 to 55°C (0 to 131°F) Wide Temp. Models: -30 to 70°C (-22 to 158°F)	-30 to 55°C (-22 to 131°F)	Standard Models: -30 to 55°C (-22 to 131°F) Wide Temp. Models: -30 to 70°C (-22 to 158°F)	Standard Models: -30 to 55°C (-22 to 131°F) Wide Temp. Models: -30 to 70°C (-22 to 158°F)
Ambient Relative Humidity	5 to 95% (non-condensing)			
Storage Temperature	-40 to 85°C (-40 to 185°F)	-40 to 75°C (-40 to 167°F)		-40 to 85°C (-40 to 185°F)
Power Requirements				
Number of Power Inputs	2 (terminal block), redundant dual inputs	2 (1 terminal block, 1 power jack)	2 (terminal block), redundant dual inputs	2 (terminal block), redundant dual inputs
Input Voltage	12 to 48 VDC			
Input Current	0.7 A @ 12 VDC; 0.2 A @ 48 VDC	0.9 A @ 12 VDC; 0.23 A @ 48 VDC	0.95 A @ 12 VDC; 0.25 A @ 48 VDC	0.7 A @ 12 VDC; 0.2 A @ 48 VDC
Standards and Certifications				
Safety	EN 60950-1, UL 60950-1	UL 60950-1		US model: UL 60950-1
EMC	EN 61000-6-2/6-4	EN 55022/24		EU model: EN 61000-6-2/6-4
Radio	EN 301 489-1, EN 301 489-7, EN 301 511, EN 301 908, EN 300 328, EN 301 893	FCC Part 22H, FCC Part 24E EN 301 489-1, EN 301 489-7, EN 301 489-24 EN 301511, EN 301 908		US model: FCC ID N7NMC7355 EU model: EN 301 489-1, EN 301 489-7, EN 301 511
Reliability				
Warranty	5 years (see www.moxa.com/warranty)			
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Cellular IP Gateways & Modems

	Cellular Advanced IP Gateway		Cellular Compact IP Gateway		Cellular Modem
	OnCell G3110-HSPA OnCell G3150-HSPA	OnCell G3110 OnCell G3150	OnCell G3111-HSPA OnCell G3151-HSPA	OnCell G3111/OnCell G3211 OnCell G3151/OnCell G3251	OnCell G2111 OnCell G2151I
Cellular Interface					
Standards	GSM/GPRS/EDGE/UMTS/HSPA	GSM/GPRS/EDGE	GSM/GPRS/EDGE/UMTS/HSPA	GSM/GPRS	GSM/GPRS
3G band Options	800/850/AWS/1900/2100 MHz	–	800/850/900/1900/2100 MHz	–	–
HSPA Data Rate	14.4 Mbps DL, 5.76 Mbps UL	–	14.4 Mbps DL, 5.76 Mbps UL	–	–
2G band Options	850/900/1800/1900 MHz		850/900/1800/1900 MHz		
EDGE Data Rate	237 kbps DL, 237 kbps UL		237 kbps DL, 237 kbps UL	–	–
GPRS Data Rate	85.6 kbps DL, 85.6 kbps UL		85.6 kbps DL, 85.6 kbps UL	85.6 kbps DL, 42.8 kbps UL	85.6 kbps DL, 42.8 kbps UL
LAN Interface					
Number of Ports	1		1		–
Ethernet	10/100M (RJ45)		10/100 Mbps (RJ45)		–
SIM Interface					
Number of SIMs	1		1		1
SIM Control	3 V		3 V		3 V
Serial Interface					
Number of Ports	1		1	1 for G3111/G3151 2 for G3211/G3251	1
Serial Standards	G3110-HSPA: RS-232 G3150-HSPA: RS-232/422/485	G3110: RS-232 G3150: RS-232/422/485	G3111-HSPA: RS-232 G3151-HSPA: RS-232/422/485	G3111/G3211: RS-232 G3151/G3251: RS-232/422/485	G2111: RS-232 G2151I: RS-232/422/485
Connector	G3110-HSPA: DB9-M G3150-HSPA: DB9-M and TB	G3110: DB9-M G3150: DB9-M and TB	DB9-M		G2111: DB9-F G2151I: DB9-F and 5-pin TB
2.5 kV Optical Isolation	–		–		– ✓
I/O Interface					
Alarm Contacts	1		–		–
Digital Inputs	2		–		–
Software					
Protocols	ARP, DDNS, DHCP/BOOTP, DNS Relay, HTTP, HTTPS, ICMP, IPSec, SMTP, SNTP, SSH, SSL, TCP/IP, Telnet, UDP	ARP, AT Commands (Virtual Modem), DDNS, DHCP/BOOTP, DNS Relay, HTTP, HTTPS, ICMP, IPSec, SMTP, SNTP, SSH, SSL, TCP/IP, Telnet, UDP	ARP, DDNS, DHCP/BOOTP, DNS Relay, HTTP, HTTPS, ICMP, SMTP, SNTP, SSH, SSL, TCP/IP, Telnet, UDP		AT Commands
Routing/Firewall	NAT, port forwarding, WAN IP filtering		NAT, port forwarding, WAN IP filtering		–
Virtual Private Network	IPSec (DES, 3DES, AES, MD5, SHA-1, SH1, DH2, DH5), PSK		–		–
Serial Security	Accessible IP list		Accessible IP list		–
Serial Operation Modes	Real COM, Reverse Real COM, TCP Server, TCP Client, UDP, SMS Tunnel, RFC2217 Secure Real COM, Secure TCP Server, Secure TCP Client, Ethernet Modem		Real COM, Reverse Real COM, TCP Server, TCP Client, UDP, SMS Tunnel, RFC2217, Ethernet Modem		–
Cellular Connectivity	GuaranLink		GuaranLink		–
Utilities	OnCell Central Manager, Wireless Search Utility, SNMP v1/v2/v3, Web/Telnet/Serial Console, SSH, Remote SMS Control, Auto IP Report		OnCell Central Manager, Wireless Search Utility, SNMP v1/v2/v3, Web/Telnet/Serial Console, SSH, Remote SMS Control, Auto IP Report		–
Physical Characteristics					
Housing	Aluminum (IP30)		Aluminum (IP30)		ABS + PC (IP30)
Weight	445 g (0.98 lb)		170 g (0.38 lb)	190 g (0.42 lb)	155 g (0.34 lb)
Dimensions	28 x 126 x 93 mm (1.1 x 4.94 x 3.64 in)		77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)		27 x 123 x 79 mm (1.06 x 4.84 x 3.11 in)
Environmental Limits					
Operating Temperature	Standard Models: -30 to 55°C (-22 to 131°F) Wide Temp. Models: -30 to 70°C (-22 to 158°F)		-30 to 55°C (-22 to 131°F)		Standard Models: -20 to 55°C (-4 to 131°F) Wide Temp. Models: -25 to 70°C (-22 to 158°F) (OnCell G2111-T only)
Ambient Relative Humidity	5 to 95% (non-condensing)		5 to 95% (non-condensing)		5 to 95% (non-condensing)
Storage Temperature	-40 to 75°C (-40 to 167°F)		-40 to 75°C (-40 to 167°F)		-40 to 75°C (-40 to 167°F)
Power Requirements					
Number of Power Inputs	2 (terminal block), redundant dual inputs		1 (terminal block)	1 (power jack)	1 (terminal block)
Input Voltage	12 to 48 VDC		12 to 48 VDC		12 to 48 VDC
Input Current	0.9 A @ 12 VDC; 0.23 A @ 48 VDC		0.9 A @ 12 VDC; 0.23 A @ 48 VDC		0.625 A @ 12 VDC; 0.16 A @ 48 VDC
Standards and Certifications					
Safety	UL 60950-1		UL 60950-1		UL 60950-1
EMC	EN 55022/24		EN 55022/24 EN 61000-6-2/6- 4	EN 55022/24	EN 55022/24
Radio	FCC Part 22H, FCC Part 24E EN 301 489-1, EN 301 489-7, EN 301 489-24 EN 301 511, EN 301 908	FCC Part 22H, FCC Part 24E EN 301 489-1, EN 301 489-7 EN 301 511	FCC Part 22H, FCC Part 24E EN 301 489-1, EN 301 489-7, EN 301 489-24 EN 301 511, EN 301 908	FCC Part 22H, FCC Part 24E EN 301 489-1, EN 301 489-7 EN 301 511	FCC Part 22H, FCC Part 24E EN 301 489-1, EN 301 489-7 EN 301 511
Mobile Network	–	OnCell G3150: PTCRB	OnCell G3151-HSPA: PTCRB	–	–
Reliability					
Warranty	5 years (see www.moxa.com/warranty)				
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Introduction to Industrial Cellular

Cellular technology has evolved in the past two decades to offer higher bandwidths for high-speed cellular applications. From 2G to 3G technology, to the current 4G network development, cellular networks are becoming faster and coverage is expanding rapidly. Moxa's advanced OnCell and WDR series are engineered with HSPA and LTE to significantly improve communication speeds and are designed specifically for remote monitoring in industrial applications. A Moxa OnCell device is available for every key role on a cellular network, including as a modem, IP gateway, and router.

Each device is engineered to transmit data as efficiently as possible, and is designed to Moxa's exacting standards of reliability and rugged durability. In addition, our new WDR series features both cellular and Wi-Fi technologies, making it easier to enable seamless wireless connections from LAN to WAN networks. Refer to the following table for a quick overview of which products are most suitable for your application:

	IP-based Cellular Routers / Wireless Routers		IP-based Cellular Gateways	
OnCell/WDR Series	OnCell 5000 Series (3G only)	WDR-3124A (3G/802.11n)	OnCell G3000 Series (2G/3G)	OnCell G3470A-LTE (4G)
Application	Reliable remote area network connectivity: WAN/SIM/Power Redundancy	Wireless LAN to WAN extension/ auto-switchover between WLAN and WWAN networks	Simple remote device connectivity: Ethernet/ serial/cellular connectivity	Reliable video-over-LTE networks
How to connect	Automatic connection to cellular operator (3G only)		Automatic connection to cellular operator	
Serial support	N/A		Virtualized COM port	N/A
LAN support	✓		✓	
WAN support	Cellular WAN / Ethernet WAN** / Backup WAN Route Support		Cellular WAN	
Security	VPN/Firewall/Routing		VPN* (advanced models only) Firewall/Serial Access Control	VPN/Firewall/Routing
Expertise Level	Easy to Use		Easy to Use	

*OnCell G3111/G3151/G3211/G3251/OnCell G3111-HSPA/G3151-HSPA IP gateways do not support VPN.
**WDR-3124A wireless router do not support Ethernet WAN.

IP-Based Cellular Routers and Gateways

IP-based OnCell products allow you to communicate with your remote devices over a TCP/IP cellular network. As long as your host computer supports the TCP/IP protocol (Internet), your SCADA and data collection system will be able to access all devices connected to a standard TCP/IP network, regardless of whether the devices are deployed locally or at a remote site. Cellular IP routers and gateways are IP-based solutions equipped with a local processor and memory to store cellular profiles and use that information to "intelligently" establish cellular connections automatically. This means that you no longer need to worry about installing an IPC or limit yourself to traditional serial devices that have dial-up capability.

You will not only eliminate the additional cost associated with deploying an IPC, but also save deployment space if your application is bound by tight space constraints. With the easy-to-use web console interface, you can enable industrial wireless communication without the need for complex AT command knowledge.

Ethernet-to-Cellular

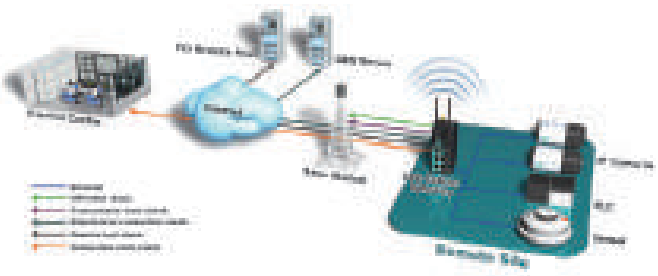
OnCell and WDR devices are assigned an IP address by your service provider (your "cellular ISP"), and outgoing TCP/IP connections are handled with Network Address Translation (NAT), allowing any number of local Ethernet devices to act as outgoing TCP/IP clients to access remote servers. However, the OnCell appears as a single IP address to the "public" Internet. This means that incoming connections must be forwarded manually, with port forwarding (or sometimes known as virtual server) based on TCP port number, to the local Ethernet devices.

Serial-to-Cellular

The OnCell enables traditional serial (RS-232/422/485) devices to transmit data over the cellular network. The OnCell is a tiny computer equipped with a CPU and TCP/IP protocols that can bi-directionally translate data between the serial and IP formats. With this solution, your computer will be able to access, manage, and configure remote facilities and equipment over the cellular network from anywhere in the world.

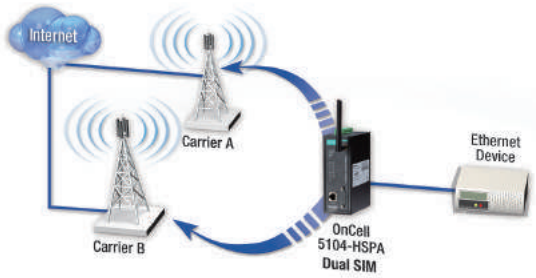
GuaranLink

OnCell and WDR IP-based products come with GuaranLink, which enables reliable, consistent connectivity. GuaranLink achieves this in a number of ways: (1) **ISP initial check:** The cellular device first sends a test packet to the base station and waits for a response before establishing a cellular connection, (2) **Transmission-level check:** Resets its cellular module before negotiating a connection to the base station, saving connection time and airtime cost, (3) **Packet-level connection check:** The cellular device sends a DNS lookup request to get the IP address of the intended receiver and pings a known remote host to ensure connection to the Internet, and (4) **Connection-alive check:** The cellular device re-registers with the base station to establish a new cellular connection to keep the connection alive after a period of inactivity.

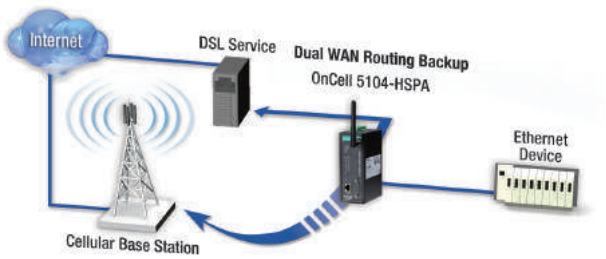


Dual-SIM and Dual-WAN Routing Backup

OnCell and WDR routers come with several levels of redundancy to enhance cellular connection availability. Dual-SIM service eliminates the risk of an unstable cellular network by offering the ability to insert two SIM cards and automatically switch between two different carriers based on the cellular connection quality.



Dual-WAN routing backup service provides the ability to set up primary and secondary WAN connections. For example, setting Ethernet WAN as the primary WAN route means that the router will primarily communicate with remote sites via the Ethernet WAN. If the path is somehow blocked, the router will automatically switch to the cellular WAN as its outgoing route, and vice versa.



Seamless Wi-Fi to Cellular Switchover

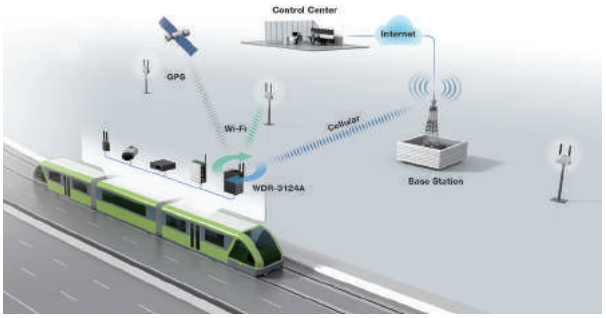
Moxa's WDR-3124A is a 4-in-1 (3G/Wi-Fi/Switch/GPS) smart wireless router that allows users to easily bring Ethernet and wireless traffic to 3G networks.

It features an auto-switchover feature that delivers seamless transmission between 802.11n radio and standard HSPA communications. When you set Wi-Fi as the primary communications link and the 3G connection as a redundant back-up path, the traffic will automatically failover to the cellular backup link within milliseconds if the primary link goes down. Seamless auto-switchover offers wireless networks flexible and always-on signal connections.

The WDR-3124A supports multiple broadband wireless connections and failover redundancy to simplify a wide variety of mobile applications with reduced total cost of ownership (TCO).

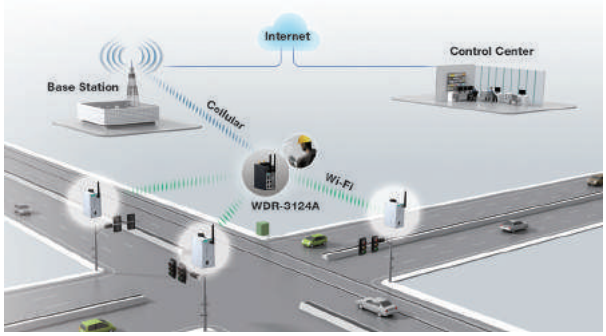
Real-time Surveillance

When installed on a bus, the WDR-3124A can act as a Wi-Fi client to upload video data to existing wayside APs; the device can auto switch to 2G/3G cellular links to connect with a remote operations center whenever the bus moves out of Wi-Fi coverage range.



Intersection Traffic Monitoring

The WDR-3124A is ideal for connecting Ethernet devices and Wi-Fi clients to 3G connections for monitoring intersection traffic. The wireless router also supports several VPN protocols to establish a secure connection between remote and central sites.



Overview of IP-based Cellular Products

OnCell IP-based Products	Ethernet-to-Cellular	Serial-to-Cellular	GuaranLink	Dual-SIM	Dual-WAN Routing	OnCell Central Manager	VPN	Auto Switchover to Wi-Fi/Cellular
OnCell G3111/G3151/G3211/G3251 OnCell G3111/G3151-HSPA	✓	✓	✓	–	–	✓	–	–
OnCell G3110/G3150 OnCell G3110/G3150-HSPA	✓	✓	✓	–	–	✓	✓	–
OnCell G3470A-LTE	✓	–	✓	✓	–	✓	✓	–
OnCell 5004/5104-HSPA	✓	–	✓	✓	✓	✓	✓	–
WDR-3124A	✓	–	✓	✓	✓	✓	✓	✓

WDR-3124A Series

Industrial 802.11n/HSPA wireless router

- Universal GSM/GPRS/HSPA cellular communications
- 2.4-GHz/5-GHz dual-band 300 Mbps Wi-Fi communication
- Built-in 4-port Gigabit Ethernet switch
- Industrial design with dual-power inputs and built-in DI/DO support
- Cellular link redundancy with dual-SIM GuaranLink support
- Antenna and power isolation design to protect against interference

802.11

c UL us LISTED CE FC

Introduction

The WDR-3124A industrial wireless router combines 802.11n and cellular technologies to provide flexible wireless network connectivity. The WDR-3124A comes with a built-in antenna and power isolation suitable for any harsh industrial environment. With DIN-rail mounting, wide operating temperature range models, and IP30 housing, the WDR-3124A is a convenient yet reliable solution for any industrial wireless application.

WLAN and Cellular Connectivity

- High-speed wireless connectivity at up to 300 Mbps
- WLAN AP/Client-Router operation mode support
- Universal cellular band support for GSM/GPRS/HSPA connectivity

Effective Isolation and Redundancy Design

- Dual-power input for power redundancy
- Dual-SIM support for cellular connection redundancy
- Antenna isolation for protection against radio interference
- Power isolation for power source insulation protection

Specifications

Cellular Interface

Standards: GSM/GPRS/EDGE/UMTS/HSPA
Band Options:
• Five-band UMTS/HSPA 800/850/900/1900/2100 MHz
• Quad-band GSM/GPRS/EDGE 850/900/1800/1900 MHz
HSPA Data Rate: 14.4 Mbps DL, 5.76 Mbps UL (Category 6, 7)
EDGE Data Rate: 237 kbps DL, 237 kbps UL (Class 12)
GPRS Data Rate: 85.6 kbps DL, 85.6 kbps UL

Wireless Interface

Standards:
IEEE 802.11a/b/g/n for Wireless LAN
IEEE 802.11i for Wireless Security
Spread Spectrum and Modulation (typical):
• DSSS with DBPSK, DQPSK, CCK
• OFDM with BPSK, QPSK, 16QAM, 64QAM
• 802.11b: CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBPSK @ 1 Mbps
• 802.11a/g: 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps
• 802.11n: 64QAM @ 300 Mbps to BPSK @ 6.5 Mbps (multiple rates supported)
Operating Channels (central frequency):
WDR-3124A-EU:
2.412 to 2.472 GHz (13 channels)
5.180 to 5.240 GHz (4 channels)

WDR-3124A-US:
2.412 to 2.462 GHz (11 channels)
5.180 to 5.240 GHz (4 channels)
5.745 to 5.825 GHz (5 channels)
Security:
• SSID broadcast enable/disable
• 64-bit and 128-bit WEP encryption, WPA /WPA2-Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP and AES)
Transmission Rates:
802.11b: 1, 2, 5.5, 11 Mbps
802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11n: 6.5 to 300 Mbps (multiple rates supported)
TX Transmit Power:
2.4 GHz
802.11b:
Typ. 23±1.5 dBm @ 1 Mbps
Typ. 20±1.5 dBm @ 5 Mbps
Typ. 19±1.5 dBm @ 11 Mbps
802.11g:
Typ. 20±1.5 dBm @ 6 to 24 Mbps
Typ. 19±1.5 dBm @ 36 Mbps
Typ. 18±1.5 dBm @ 48 Mbps
Typ. 17±1.5 dBm @ 54 Mbps

802.11n:
Typ. 20±1.5 dBm @ MCS0/8 20 MHz
Typ. 20±1.5 dBm @ MCS0/8 40 MHz
Typ. 16±1.5 dBm @ MCS7/15 20 MHz
Typ. 16±1.5 dBm @ MCS7/15 40 MHz
5 GHz
802.11a:
Typ. 20±1.5 dBm @ 6 to 24 Mbps
Typ. 19±1.5 dBm @ 36 Mbps
Typ. 16±1.5 dBm @ 48 Mbps
Typ. 15±1.5 dBm @ 54 Mbps
802.11n:
Typ. 19±1.5 dBm @MCS0/8 20 MHz
Typ. 18±1.5 dBm @MCS0/8 40 MHz
Typ. 14±1.5 dBm @MCS7/15 20 MHz
Typ. 14±1.5 dBm @MCS7/15 40 MHz

RX Sensitivity:
2.4 GHz
802.11b:
-90 dBm @ 1 Mbps
-88 dBm @ 2 Mbps
-86 dBm @ 5.5 Mbps
-84 dBm @ 11 Mbps
802.11g:
-85 dBm @ 6 Mbps
-84 dBm @ 9 Mbps
-83 dBm @ 12 Mbps
-82 dBm @ 18 Mbps
-80 dBm @ 24 Mbps
-76 dBm @ 36 Mbps
-70 dBm @ 48 Mbps
-70 dBm @ 54 Mbps
802.11n:
-70 dBm @ MCS7 20 MHz
-68 dBm @ MCS15 20 MHz
-65 dBm @ MCS7 40 MHz
-63 dBm @ MCS15 40 MHz
5 GHz
802.11a:
-92 dBm @ 6 Mbps
-89 dBm @ 9 Mbps
-85 dBm @ 12 Mbps
-82 dBm @ 18 Mbps
-80 dBm @ 24 Mbps
-76 dBm @ 36 Mbps
-74 dBm @ 48 Mbps
-72 dBm @ 54 Mbps
802.11n:
-70 dBm @ MCS7 20 MHz
-67 dBm @ MCS15 20 MHz
-68 dBm @ MCS7 40 MHz
-66 dBm @ MCS15 40 MHz

LAN Interface

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseTX
IEEE 802.3ab for 1000BaseT
Number of Ports: 4
Speed: 10/100/1000 Mbps auto negotiation speed, F/H duplex mode and auto MDI/MDI-X connection (RJ45-type)

Interface

Cellular Antenna Connectors: 1 SMA (female) for WCDMA
Wireless Antenna Connectors: 2 RP-SMA (female)
GNSS: 1 SMA (female), GPS (1575.42 MHz), GLONASS (1602 MHz)
Console Port: 1, RS-232 (RJ45)
LED Indicators: PWR1, PWR2, STATUS, FAULT, CELLULAR SIGNAL, WIFI SIGNAL, WLAN, SIM1, SIM2, 2G, 3G, GPS
Ground Screw: M5
Reset Button: Power Reset/Factory Default Reset

I/O Interface

Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 electrically isolated inputs
• +13 to +30 V for state “1”
• +3 to -30 V for state “0”

Software

Network Protocols: ICMP, DDNS, TCP/IP, UDP, DHCP, Telnet, DNS, SNMP, HTTP, HTTPS, SMTP, SNTP, ARP
Routing/Firewall: NAT, port forwarding, IP/MAC/Port filtering
VPN:
• Max. Tunnel Number: 5 (Responder/Initiator)
• IPSec (DES, 3DES, AES, MD5, SHA-1, DH2, DH5), PSK/X.509/RSA
Cellular Connectivity: GuaranLink
GPS: NMEA

Management Software

Utilities: Wireless Search Utility
Configuration and Management Options: SNMP v1/v2c/v3, Web/Telnet/Serial Console, SSH, Remote SMS Control, Auto IP Report
Private IP Solution: OnCell Central Manager

SIM Interface

Number of SIMs: 2
SIM Control: 3 V

Physical Characteristics

Housing: Aluminum, providing IP30 protection
Weight: 1280 g (2.82 lb)
Dimensions: 66.3 X 124 X 90 mm (2.61 x 4.88 x 3.54 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (0 to 131°F)
Wide Temp. Models:-30 to 70°C (-22 to 158°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Number of Power Inputs: 2 (terminal block), redundant dual inputs
Input Voltage: 12 to 48 VDC
Input Current: 0.7 A @ 12 VDC; 0.2 A @ 48 VDC
Reverse Polarity Protection: Present

Standards and Certifications

Safety: EN 60950-1, UL 60950-1
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Radio: EN 301 489-1, EN 301 489-7, EN 301 511, EN 301 908, EN 300 328, EN 301 893, FCC ID SLE-WAPN005

MTBF (mean time between failures)

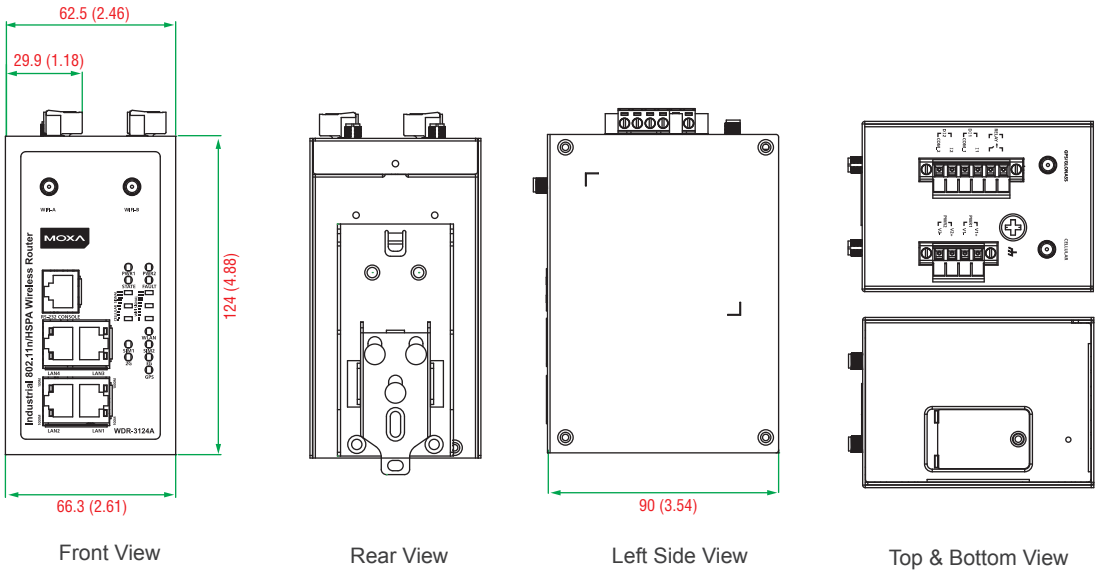
Time: 382,851 hrs
Standard: Telcordia SR332

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Front View | Rear View | Left Side View | Top & Bottom View

Ordering Information

Available Models

WDR-3124A-US: Industrial 802.11n/HSPA wireless router, WiFi US band, 0 to 55°C operating temperature
WDR-3124A-US-T: Industrial 802.11n/HSPA wireless router, WiFi US band, -30 to 70°C operating temperature
WDR-3124A-EU: Industrial 802.11n/HSPA wireless router, WiFi EU band, 0 to 55°C operating temperature
WDR-3124A-EU-T: Industrial 802.11n/HSPA wireless router, WiFi EU band, -30 to 70°C operating temperature
Note: Visit Moxa's website for a complete list of optional wireless accessories and antennas available for Moxa's wireless products.

Package Checklist

- WDR-3124A wireless router
- 2 2.4/5 GHz antennas: ANT-WDB-ARM-02
- 1 UMTS/HSPA antenna: ANT-WCDMA-ASM-1.5
- 5 plastic RJ45 protective caps for serial console and Ethernet ports
- DIN-rail kit
- Quick installation guide (printed)
- Warranty card

OnCell 5004/5104-HSPA Series

Industrial five-band GSM/GPRS/EDGE/UMTS/HSPA cellular routers

OnCell 5004-HSPA Series

OnCell 5104-HSPA Series

- Five band UMTS/HSPA 800/850/AWS/1900/2100 MHz
- Quad-band GSM/GPRS/EDGE 850/900/1800/1900 MHz
- Cellular WAN and Ethernet WAN backup mechanism for a complete path redundancy
- Primary and secondary power inputs for power source redundancy
- Cellular link redundancy with dual-SIM GuaranLink support
- DIN-rail housing and wall-mountable housing
- Connect to 4 10/100BaseT(X) devices over an integrated VPN
- 2 digital inputs and 1 relay output (OnCell 5104-HSPA only)
- Centralize private IP management with OnCell Central Manager

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Overview

The OnCell 5004/5104-HSPA series are high-performance industrial grade cellular routers that allow up to 4 Ethernet-based devices to simultaneously use a single cellular data account for primary or backup network connectivity to remote sites and devices. Both products provide the functionality of a cellular router, firewall, and switch in one device, and to ensure zero data loss and on-demand cellular communication, the OnCell 5004/5104-HSPA are integrated with the GuaranLink function. The difference between the OnCell 5004-HSPA and OnCell 5104-HSPA is that the OnCell 5104-HSPA comes with a built-in relay output that can be configured to indicate the priority of events when notifying or warning engineers in the field, and the two digital inputs allow you to connect basic I/O devices, such as sensors, to the cellular network. The OnCell 5004-HSPA can be placed on a desktop or mounted on a wall, whereas the OnCell 5104-HSPA has an IA design and can be attached to a DIN-rail. Both products use 12 to 48 VDC power inputs with a screw-on design for greater reliability, and the Ethernet ports come with 1.5 kV magnetic isolation protection to keep your system safe from unexpected electrical discharges.

Specifications

Cellular Interface

Standards: GSM/GPRS/EDGE/UMTS/HSPA
Band Options:
• Five-band UMTS/HSPA 800/850/AWS/1900/2100 MHz
• Quad-band GSM/GPRS/EDGE 850/900/1800/1900 MHz
HSPA Data Rate: 14.4 Mbps DL, 5.76 Mbps UL
EDGE Multi-slot Class: Class 12
EDGE Data Rate: 237 kbps DL, 237 kbps UL
EDGE Terminal Device Class: Class B
GPRS Multi-slot Class: Class 12
GPRS Data Rate: 85.6 kbps DL, 85.6 kbps UL
GPRS Terminal Device Class: Class B
GPRS Coding Schemes: CS1 to CS4
Tx Power:
UMTS/HSPA: 0.25 W
EDGE900: 0.5 W
EDGE1800: 0.4 W
GSM1800: 1 W
GSM900: 2 W

WAN Interface

Number of Ports: 1
Ethernet: 10/100 Mbps, RJ45 connector, auto MDI/MDIX

LAN Interface

Number of Ports: 4
Ethernet: 10/100 Mbps, RJ45 connector, auto MDI/MDIX

Interface

Cellular Antenna Connectors: 1, SMA (female)
Console Port: RS-232 (RJ45)

I/O Interface (OnCell 5104-HSPA)

Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 electrically isolated inputs
• +13 to +30 V for state “1”
• +3 to -30 V for state “0”

Software

Network Protocols: ARP, DDNS, DHCP/BOOTP, DNS Relay, HTTP, HTTPS, ICMP, IPSec, PPP, PPPoE, SMTP, SNTP, SSL, TCP/IP, Telnet, UDP
Routing/Firewall: NAT, port forwarding, WAN IP filtering, static route
Cellular Connectivity: GuaranLink
Authentication: Local username and password

Management Software

Utilities: Wireless Search Utility
Configuration and Management Options: SNMP v1/v2c/v3, Web/Telnet/Serial Console, SSH, Remote SMS Control, Auto IP Report
Private IP Solution: OnCell Central Manager

SIM Interface

Number of SIMs: 2
SIM Control: 3 V

Physical Characteristics

Housing: Aluminum, providing IP30 protection

Weight:
OnCell 5004-HSPA: 510 g (1.12 lb)
OnCell 5104-HSPA: 650 g (1.43 lb)
Dimensions:
OnCell 5004-HSPA: 158 x 103 x 35 mm (6.22 x 4.06 x 1.38 in)
OnCell 5104-HSPA: 51 x 135 x 103 mm (2 x 5.32 x 4.16 in)

Environmental Limits

Operating Temperature:
Standard Models: -30 to 55°C (-22 to 131°F)
Wide Temp. Models: -30 to 70°C (-22 to 158°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Number of Power Inputs:
OnCell 5004-HSPA: 2 (1 terminal block, 1 power jack)
OnCell 5104-HSPA: 2 (terminal block), redundant dual inputs
Input Voltage: 12 to 48 VDC
Input Current:
OnCell 5004-HSPA: 0.9 A @ 12 VDC; 0.23 A @ 48 VDC
OnCell 5104-HSPA: 0.95 A @ 12 VDC; 0.25 A @ 48 VDC
Reverse Polarity Protection: Present (OnCell 5104-HSPA only)

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 1 kV; Signal: 1 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Radio: FCC Part 22H, FCC Part 24E, EN 301 489-1, EN 301 489-7, EN 301 489-24, EN 301 511, EN 301 908

MTBF (mean time between failures)

Time:
OnCell 5004-HSPA: 441,000 hrs
OnCell 5104-HSPA: 411,000 hrs
Standard: Telcordia SR332

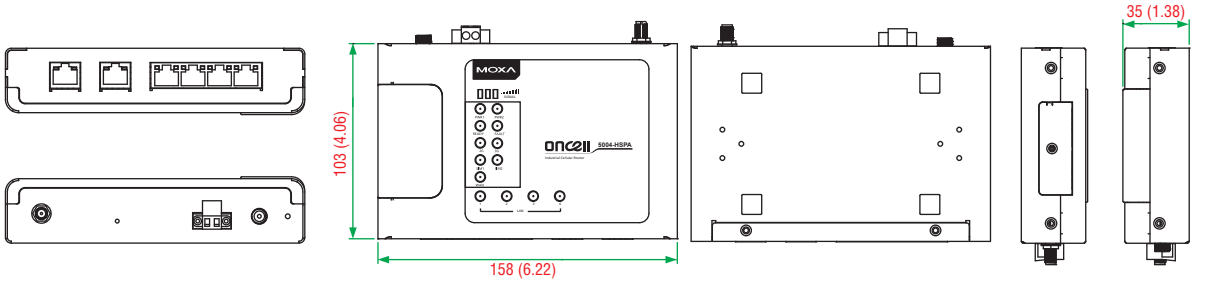
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

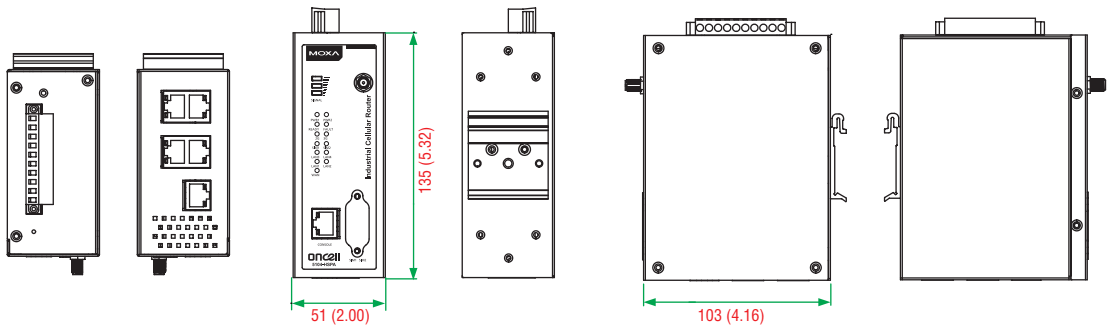
Unit: mm (inch)

OnCell 5004-HSPA



Top & Bottom View | Front & Rear View | Left & Right Side View

OnCell 5104-HSPA



Top & Bottom View | Front & Rear View | Left & Right Side View

Ordering Information

Available Models

OnCell 5004-HSPA: 4-port five-band industrial GSM/GPRS/EDGE/UMTS/HSPA router, -30 to 55°C operating temperature
OnCell 5104-HSPA: 4-port five-band industrial GSM/GPRS/EDGE/UMTS/HSPA router, IA design, -30 to 55°C operating temperature
OnCell 5104-HSPA-T: 4-port five-band industrial GSM/GPRS/EDGE/UMTS/HSPA router, IA design, -30 to 70°C operating temperature
Note: Please visit Moxa's website for a complete list of optional wireless accessories and antennas available for Moxa's wireless products.

Package Checklist

- OnCell 5x04-HSPA cellular router
- 1 UMTS/HSPA antenna: ANT-WCDMA-ASM-1.5
- Rubber stand (OnCell 5004-HSPA only)
- Wallmount kit (OnCell 5004-HSPA only)
- DIN-rail kit (OnCell 5104-HSPA only)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Note: An activated SIM card (not included) must be provided by a third party Cellular Service Provider.

OnCell G3470A-LTE Series

Industrial LTE cellular gateway

- LTE Band Support
  - EU Model: 2100/1800/2600/900/800 MHz (B1/B3/B7/B8/B20)
  - US Model: 1900/AWS/850/700/700/1900 MHz (B2/B4/B5/B13/B17/B25)
- Built-in high speed 4-port Ethernet switch
- Industrial design with dual-power input and built-in DI/DO support
- Cellular link redundancy with dual-SIM GuaranLink support
- Antenna and power isolation design to protect against interference

Introduction

Moxa's OnCell G3470A-LTE LTE Ethernet IP gateway provides a higher cellular bandwidth and more reliable connection to your Ethernet network for cellular applications. With an integrated 4-port Gigabit Ethernet switch and LTE support, the OnCell G3470A-LTE offers a faster cellular connection with a lower total cost of ownership. To enhance reliability, a key for industrial users, the OnCell G3470A-LTE provides isolation for both power and antenna inputs. Coupled with high-level EMS and wide-temperature support, the OnCell G3470A-LTE provides the highest level of device stability in any rugged environment. In addition, with dual-SIM and dual-power input features, the OnCell G3470A-LTE offers network redundancy to ensure uninterrupted connectivity for your applications.

Multi-Band Support

- EU Model: 2100/1800/2600/900/800 MHz (B1/B3/B7/B8/B20)
- US Model: 1900/AWS/850/700/700/1900 MHz (B2/B4/B5/B13/B17/B25)

Isolation and Redundancy Design

- Dual-power input for power redundancy
- Dual-SIM support for cellular connection redundancy
- Antenna isolation for protection against radio interference
- Power isolation for power source insulation protection
- GuaranLink for reliable cellular connectivity

Specifications

Cellular Interface

Standards: GSM/GPRS/EDGE/UMTS/HSPA/LTE
Band Options:
OnCell G3470A-LTE-EU:
• LTE 2100/1800/2600/900/800 MHz (B1/B3/B7/B8/B20)
• UMTS/HSPA 2100/1900/850/800/900 MHz
OnCell G3470A-LTE-US:
• LTE 1900/AWS/850/700/1900 MHz (B2/B4/B5/B13/B17/B25)
• UMTS/HSPA 2100/1900/AWS/850/900 MHz
• Universal quad-band GSM/GPRS/EDGE 850/900/1800/1900 MHz
LTE Data Rate:
• 20 MHz bandwidth: 100 Mbps DL, 50 Mbps UL
• 10 MHz bandwidth: 50 Mbps DL, 25 Mbps UL
HSPA Data Rate: 42 Mbps DL, 5.76 Mbps UL (Category 24, 6)
EDGE Data Rate: 237 kbps DL, 237 kbps UL (Class 10, 12)
GPRS Data Rate: 85.6 kbps DL, 42.8 kbps UL

LAN Interface

Number of Ports: 4
Ethernet: 10/100/1000 Mbps, RJ45 connector, auto MDI/MDIX

Interface

Cellular Antenna Connectors: 2, SMA (female)
GNSS: 1 SMA (female), GPS (1575.42 MHz), GLONASS (1602 MHz)
Console Port: RS-232 (RJ45)
LED Indicators: PWR1, PWR2, READY, FAULT, CELLULAR SIGNAL, SIM1, SIM2, 2G, 3G, 4G, GPS
Ground Screw: M5
Reset Button: Power Reset/Factory Default Reset

I/O Interface

Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 electrically isolated inputs
• +13 to +30 V for state "1"
• +3 to -30 V for state "0"

Software

Network Protocols: ICMP, DDNS, TCP/IP, UDP, DHCP, Telnet, DNS, SNMP, HTTP, HTTPS, SMTP, SNTP, ARP
Routing/Firewall: NAT, port forwarding, IP/MAC/Port filtering
VPN:
• Max. Tunnel Number: 5 (Responder/Initiator)
• IPSec (DES, 3DES, AES, MD5, SHA-1, DH2, DH5), PSK/X.509/RSA
Cellular Connectivity: GuaranLink
GPS: NMEA

Management Software

Utilities: Wireless Search Utility
Configuration and Management Options: SNMP v1/v2c/v3, Web / Telnet / Serial Console, SSH, Remote SMS Control
Private IP Solution: OnCell Central Manager

SIM Interface
Number of SIMs: 2
SIM Control: 3 V

Physical Characteristics
Housing: Aluminum, providing IP30 protection
Weight: 1300 g (2.87 lb)
Dimensions: 66.3 x 124 x 90 mm (2.61 x 4.88 x 3.54 in)

Environmental Limits
Operating Temperature:
Standard Models: -30 to 55°C (-22 to 131°F)
Wide Temp. Models:-30 to 70°C (-22 to 158°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements
Number of Power Inputs: 2 (terminal block), redundant dual inputs
Input Voltage: 12 to 48 VDC
Input Current: 0.7 A @ 12 VDC; 0.2 A @ 48 VDC
Reverse Polarity Protection: Present

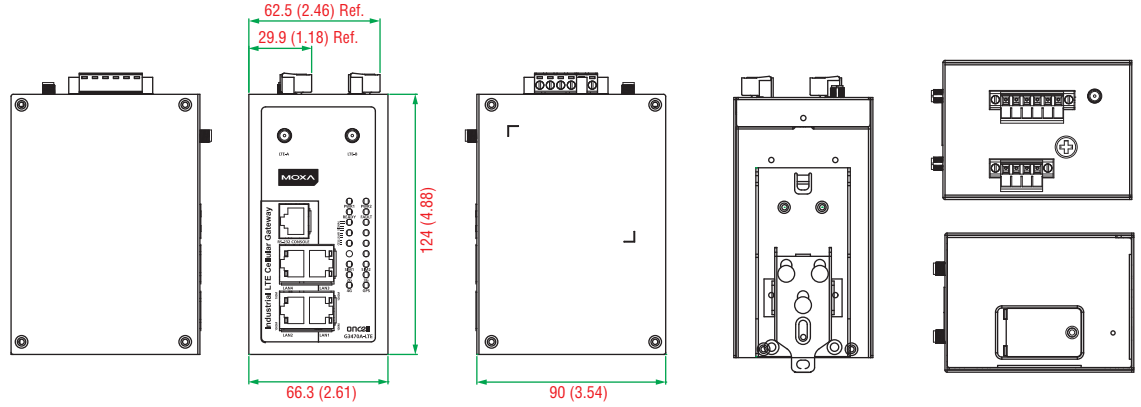
Standards and Certifications
Safety: OnCell G3470A-LTE-US: UL 60950-1
EMC: OnCell G3470A-LTE-EU: EN 61000-6-2/6-4
EMI: OnCell G3470A-LTE-US: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 1 kV; Signal: 1 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Radio:
OnCell G3470A-LTE-US: FCC ID N7NMC7355
OnCell G3470A-LTE-EU: EN 301 489-1, EN 301 489-7, EN 301 511

MTBF (mean time between failures)
Time: 327,326 hrs
Standard: Telcordia SR332

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Left Side View | Front View | Right Side View | Rear View | Top & Bottom View

Ordering Information

Available Models
OnCell G3470-LTE-US: Industrial LTE cellular gateway, B2/B4/B5/B13/B17/B25, -30 to 55°C operating temperature
OnCell G3470-LTE-US-T: Industrial LTE cellular gateway, B2/B4/B5/B13/B17/B25, -30 to 70°C operating temperature
OnCell G3470-LTE-EU: Industrial LTE cellular gateway, B1/B3/B7/B8/B20, -30 to 55°C operating temperature
OnCell G3470-LTE-EU-T: Industrial LTE cellular gateway, B1/B3/B7/B8/B20, -30 to 70°C operating temperature
Note: Please visit Moxa's website for a complete list of optional wireless accessories and antennas available for Moxa's wireless products.

Package Checklist
- OnCell G3470A-LTE cellular gateway
- 2 UMTS/LTE antennas: ANT-LTEUS-ASM-01 (US model)
- 2 UMTS/LTE antennas: ANT-LTE-ASM-02 (EU model)
- 5 plastic RJ45 protective caps for serial console and Ethernet ports
- 1 GPS connector terminator
- DIN-rail kit
- Quick installation guide (printed)
- Warranty card

OnCell G3110/G3150-HSPA Series

Advanced five-band GSM/GPRS/EDGE/UMTS/HSPA IP gateways

- Five band UMTS/HSPA 800/850/AWS/1900/2100 MHz
- Quad-band GSM/GPRS/EDGE 850/900/1800/1900 MHz
- Redundant DC power inputs
- Connect to Ethernet and serial devices over an integrated VPN
- 2 digital inputs and 1 relay output
- Centralize private IP management software with OnCell Central Manager

Overview

The OnCell G3110/G3150-HSPA series of high-speed industrial-grade IP gateways are intelligent wireless communication platforms that connect your Ethernet and serial devices over a cellular TCP/IP network. The OnCell G3110/G3150-HSPA series offers connectivity to all five HSPA/UMTS frequency bands and quad GSM/GPRS/EDGE frequency bands used in Europe and the United States, allowing the most flexible global deployment on the best available network.

The OnCell G3110/G3150-HSPA products come with private IP management software and support VPN for handling IP addresses on cellular networks, and have a built-in relay output that can be configured to indicate the priority of events when notifying or warning engineers in the field. Two digital inputs also allow you to connect basic I/O devices, and the OnCell G3110/G3150-HSPA series comes with redundant power inputs to assure non-stop operation.

Specifications

Cellular Interface

Standards: GSM/GPRS/EDGE/UMTS/HSPA
Band Options:
• Five-band UMTS/HSPA 800/850/AWS/1900/2100 MHz
• Quad-band GSM/GPRS/EDGE 850/900/1800/1900 MHz
HSPA Data Rate: 14.4 Mbps DL, 5.76 Mbps UL
EDGE Multi-slot Class: Class 12
EDGE Data Rate: 237 kbps DL, 237 kbps UL
EDGE Terminal Device Class: Class B
GPRS Multi-slot Class: Class 12
GPRS Data Rate: 85.6 kbps DL, 85.6 kbps UL
GPRS Terminal Device Class: Class B
GPRS Coding Schemes: CS1 to CS4
Tx Power:
UMTS/HSPA: 0.25 W
EDGE900: 0.5 W
EDGE1800: 0.4 W
GSM1800: 1 W
GSM900: 2 W

LAN Interface

Number of Ports: 1
Ethernet: 10/100 Mbps, RJ45 connector, auto MDI/MDIX

Interface

Cellular Antenna Connectors: 1, SMA (female)

I/O Interface

Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 electrically isolated inputs
• +13 to +30 V for state “1”
• +3 to -30 V for state “0”

Software

Network Protocols: ARP, DDNS, DHCP/BOOTP, DNS Relay, HTTP, HTTPS, ICMP, IPSec, SMTP, SNTP, SSH, SSL, TCP/IP, Telnet, UDP
Routing/Firewall: NAT, port forwarding, WAN IP filtering
Cellular Connectivity: GuaranLink
Serial Security: Accessible IP list
Serial Operation Modes: Real COM, Reverse Real COM, TCP Server, TCP Client, UDP, SMS Tunnel, RFC2217, Secure Real COM, Secure Reverse Real COM, Secure TCP Server, Secure TCP Client, Ethernet Modem
Windows Real COM Drivers: Windows 2000/XP/2003/Vista/7/Server 2008, Windows XP/2003/Vista/7/Server 2008 x64 Edition
Fixed TTY Drivers: SCO Unix, SCO OpenServer 5, SCO OpenServer 6, UnixWare 7, SVR4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD 5, FreeBSD 6
Linux Real TTY Drivers: Linux kernels 2.2.x, 2.4.x, 2.6.x
Authentication: Local username and password

Management Software

Utilities: Wireless Search Utility
Configuration and Management Options: SNMP v1/v2c/v3, Web/Telnet/Serial Console, SSH, Remote SMS Control, Auto IP Report
Private IP Solution: OnCell Central Manager

SIM Interface

Number of SIMs: 1
SIM Control: 3 V

Serial Interface

Number of Ports: 1
Serial Standards:
OnCell G3110-HSPA: RS-232 (DB9 male connector)
OnCell G3150-HSPA: RS-232 (DB9 male connector), RS-422/485 (5-pin terminal block connector)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2 (when parity = None)
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
Baudrate: 50 bps to 921.6 kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Physical Characteristics

Housing: Aluminum, providing IP30 protection
Weight: 445 g (0.98 lb)
Dimensions: 28 x 126 x 93 mm (1.1 x 4.94 x 3.64 in)

Environmental Limits

Operating Temperature:
Standard Models: -30 to 55°C (-22 to 131°F)
Wide Temp. Models: -30 to 70°C (-22 to 158°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Number of Power Inputs: 2 (terminal block), redundant dual inputs
Input Voltage: 12 to 48 VDC
Input Current: 0.9 A @ 12 VDC; 0.23 A @ 48 VDC
Reverse Polarity Protection: Present

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 1 kV
IEC 61000-4-6 CS: 3 V
IEC 61000-4-8
Radio: FCC Part 22H, FCC Part 24E, EN 301 489-1, EN 301 489-7, EN 301 489-24, EN 301 511, EN 301 908

MTBF (mean time between failures)

Time: 380,000 hrs
Standard: Telcordia SR332

Warranty

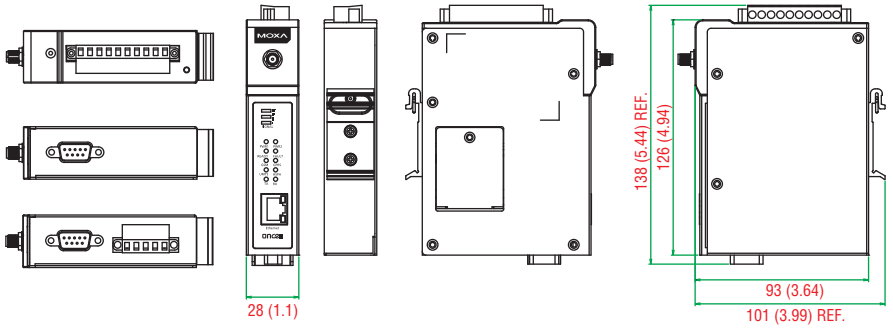
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions & Pin Assignment

Unit: mm (inch)

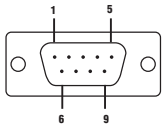
OnCell G3110-HSPA Series

OnCell G3150-HSPA Series



Top & Bottom View Front & Rear View Left & Right Side View

DB9 male connector



PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–
9	–	–	–

Ordering Information

Available Models

OnCell G3110-HSPA: 1-port five-band industrial GSM/GPRS/EDGE/UMTS/HSPA IP gateway, RS-232, -30 to 55°C operating temperature
OnCell G3150-HSPA: 1-port five-band industrial GSM/GPRS/EDGE/UMTS/HSPA IP gateway, RS-232/422/485, -30 to 55°C operating temperature
OnCell G3110-HSPA-T: 1-port five-band industrial GSM/GPRS/EDGE/UMTS/HSPA IP gateway, RS-232, -30 to 70°C operating temperature
OnCell G3150-HSPA-T: 1-port five-band industrial GSM/GPRS/EDGE/UMTS/HSPA IP gateway, RS-232/422/485, -30 to 70°C operating temperature
Note: Please visit Moxa's website for a complete list of optional wireless accessories and antennas available for Moxa's wireless products.

Package Checklist

- OnCell G31x0-HSPA IP gateway
- 1 UMTS/HSPA antenna: ANT-WCDMA-ASM-1.5
- DIN-rail kit
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Note: An activated SIM card (not included) must be provided by a third party Cellular Service Provider.

OnCell G3110/G3150

Advanced quad-band GSM/GPRS/EDGE IP gateways

- Universal quad-band GSM/GPRS/EDGE 850/900/1800/1900 MHz
- Redundant DC power input
- GuaranLink for reliable, consistent connectivity
- DIN-rail mounting
- Connect to Ethernet and serial devices over an integrated VPN
- 2 digital inputs and 1 relay output
- Centralize private IP management software with OnCell Central Manager

Overview

The OnCell G3110 and G3150 industrial RS-232 and RS-232/422/485 GSM/GPRS/EDGE IP gateways are designed to transmit data transparently over GSM/GPRS/EDGE cellular networks. The OnCell G3110 and G3150 can transmit data from both serial devices and Ethernet devices to a WAN interface, and come with private IP management software and VPN support for handling IP addresses on cellular networks. The products also come with a built-in relay output that can be configured to indicate the priority of events when notifying or warning engineers in the field. Two digital inputs also allow you to connect basic I/O devices, and the OnCell's redundant power inputs assure non-stop operation. The OnCell G3110/G3150 series also offers wide temperature models which can withstand extreme temperature conditions.

Specifications

Cellular Interface

Standards: GSM/GPRS/EDGE
Band Options: Quad-band 850/900/1800/1900 MHz
EDGE Multi-slot Class: Class 12
EDGE Data Rate: 237 kbps DL, 237 kbps UL
EDGE Terminal Device Class: Class B
GPRS Multi-slot Class: Class 12
GPRS Data Rate: 85.6 kbps DL, 43 kbps UL
GPRS Terminal Device Class: Class B
GPRS Coding Schemes: CS1 to CS4
Tx Power:
GSM1800/1900: 1 W
EGSM850/900: 2 W

LAN Interface

Number of Ports: 1
Ethernet: 10/100 Mbps, RJ45 connector, auto MDI/MDIX

Interface

Cellular Antenna Connectors: 1, SMA (female)

I/O Interface

Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 electrically isolated inputs
• +13 to +30 V for state "1"
• +3 to -30 V for state "0"

Software

Network Protocols: ARP, AT Commands (Virtual Modem), DDNS, DHCP/BOOTP, DNS Relay, HTTP, HTTPS, ICMP, IPSec, SMTP, SNTP, SSH, SSL, TCP/IP, Telnet, UDP
Routing/Firewall: NAT, port forwarding, WAN IP filtering
Cellular Connectivity: GuaranLink
Serial Security: Accessible IP list
Serial Operation Modes: Real COM, Reverse Real COM, TCP Server, TCP Client, UDP, SMS Tunnel, RFC2217, Secure Real COM, Secure Reverse Real COM, Secure TCP Server, Secure TCP Client, Virtual Modem, Ethernet Modem
Windows Real COM Drivers: Windows 2000/XP/2003/Vista/Server 2008, Windows XP/2003/Vista/Server 2008 x64 Edition
Fixed TTY Drivers: SCO Unix, SCO OpenServer 5, SCO OpenServer 6, UnixWare 7, SVR4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD 5, FreeBSD 6
Linux Real TTY Drivers: Linux kernels 2.2.x, 2.4.x, 2.6.x
Authentication: Local username and password

Management Software

Utilities: Wireless Search Utility
Configuration and Management Options: SNMP v1/v2c/v3, Web/Telnet/Serial Console, SSH, Remote SMS Control, Auto IP Report
Private IP Solution: OnCell Central Manager

SIM Interface

Number of SIMs: 1
SIM Control: 3 V

Serial Interface

Number of Ports: 1
Serial Standards:
OnCell G3110: RS-232 (DB9 male connector)
OnCell G3150: RS-232 (DB9 male connector), RS-422/485 (5-pin terminal block connector)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2 (when parity = None)
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
Baudrate: 50 bps to 921.6 kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Physical Characteristics

Housing: Aluminum, providing IP30 protection
Weight: 445 g (0.98 lb)
Dimensions: 28 x 126 x 93 mm (1.1 x 4.94 x 3.64 in)

Environmental Limits

Operating Temperature:
Standard Temperature: -30 to 55°C (-22 to 131°F)
Wide Temperature: -30 to 70°C (-22 to 158°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Number of Power Inputs: 2 (terminal block), redundant dual inputs
Input Voltage: 12 to 48 VDC
Input Current: 0.9 A @ 12 VDC; 0.23 A @ 48 VDC
Reverse Polarity Protection: Present

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 1 kV
IEC 61000-4-6 CS: 3 V
IEC 61000-4-8
Radio: FCC Part 22H, FCC Part 24E, EN 301 489-1, EN 301 489-7, EN 301 511, PTCRB (OnCell G3150 only)

MTBF (mean time between failures)

Time: 339,000 hrs
Standard: Telcordia SR332

Warranty

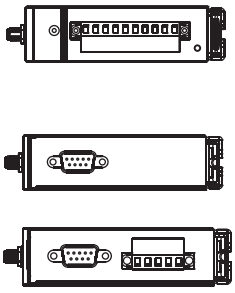
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions & Pin Assignment

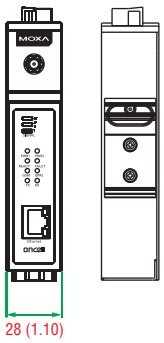
Unit: mm (inch)

OnCell G3110

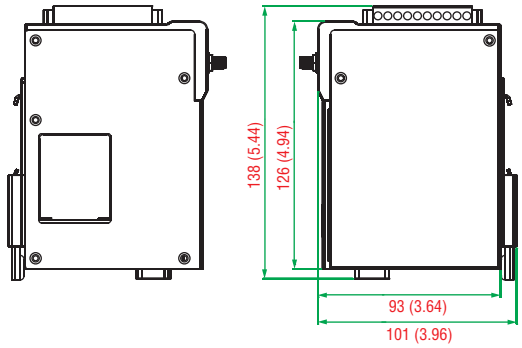
OnCell G3150



Top & Bottom View

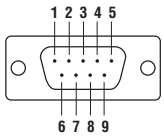


Front & Rear View



Left & Right Side View

DB9 male connector



PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–
9	–	–	–

Ordering Information

Available Models

OnCell G3110: 1-port quad-band industrial GSM/GPRS/EDGE IP gateway, RS-232, -30 to 55°C operating temperature
OnCell G3150: 1-port quad-band industrial GSM/GPRS/EDGE IP gateway, RS-232/422/485, -30 to 55°C operating temperature
OnCell G3110-T: 1-port quad-band industrial GSM/GPRS/EDGE IP gateway, RS-232, -30 to 70°C operating temperature
OnCell G3150-T: 1-port quad-band industrial GSM/GPRS/EDGE IP gateway, RS-232/422/485, -30 to 70°C operating temperature
Note: Please visit Moxa's website for a complete list of optional wireless accessories and antennas available for Moxa's wireless products.

Package Checklist

- OnCell G31x0 IP gateway
- 1 GSM/GPRS antenna: ANT-CQB-ASM-01
- DIN-rail kit
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Note: An activated SIM card (not included) must be provided by a third party Cellular Service Provider.

OnCell G3111/G3151-HSPA Series

Compact five-band GSM/GPRS/EDGE/UMTS/HSPA IP gateways

- Five-band UMTS/HSPA 800/850/900/1900/2100 MHz
- Quad-band GSM/GPRS/EDGE 850/900/1800/1900 MHz
- GuaranLink support for a reliable cellular connectivity
- Ethernet, serial, and cellular communication
- Centralize private IP management software with OnCell Central Manager
- Industrial-grade design for high device reliability

Introduction

The OnCell G3111/G3151-HSPA are cellular IP gateways that can conveniently and transparently connect your existing Ethernet and serial devices to a 3G cellular network. With the integrated GuaranLink feature, you can be confident that your device will always stay connected or recovered from any unexpected interference. With Moxa's industrial design, higher EMS level are tested to ensure the highest reliability for any harsh environment. The G3111/G3151-HSPA cellular IP gateways are the most compact, simple and robust industrial 3G solution.

Universal Band Support

- Five-band UMTS/HSPA 850/800, 900, 1900, 2100 MHz
- Quad-band GSM/GPRS/EDGE 850/900/1800/1900 MHz

Simple, Flexible, and Reliable

- Ethernet/serial/cellular co-existance for simple and flexible communication
- OnCell Central Management for private IP communication and centralized management
- Industrial-grade design for high device realibility
- GuaranLink for reliable cellular connnectivity

Specifications

Cellular Interface

Standards: GSM/GPRS/EDGE/UMTS/HSPA
Band Options:
• Five-band UMTS/HSPA 800/850/900/1900/2100 MHz
• Quad-band GSM/GPRS/EDGE 850/900/1800/1900 MHz
HSPA Data Rate: 14.4 Mbps DL, 5.76 Mbps UL
EDGE Multi-slot Class: Class 12
EDGE Data Rate: 237 kbps DL, 237 kbps UL
EDGE Terminal Device Class: Class B
GPRS Multi-slot Class: Class 12
GPRS Data Rate: 85.6 kbps DL, 85.6 kbps UL
GPRS Terminal Device Class: Class B
GPRS Coding Schemes: CS1 to CS4

LAN Interface

Number of Ports: 1
Ethernet: 10/100 Mbps, RJ45 connector, auto MDI/MDIX

Interface

Cellular Antenna Connectors: 1, SMA (female)

Software

Network Protocols: ARP, DDNS, DHCP/BOOTP, DNS Relay, HTTP, HTTPS, ICMP, SMTP, SNTP, SSH, SSL, TCP/IP, Telnet, UDP
Routing/Firewall: NAT, port forwarding, WAN IP filtering
Cellular Connectivity: Guaranlink
Serial Security: Accessible IP list
Serial Operation Modes: Real COM, Reverse Real COM, TCP Server, TCP Client, UDP, SMS Tunnel, RFC2217, Ethernet Modem
Windows Real COM Drivers: Windows 2000/XP/2003/Vista/7/Server 2008, Windows XP/2003/Vista/7/Server 2008 x64
Fixed TTY Drivers: SCO Unix, SCO OpenServer 5, SCO OpenServer 6, UnixWare 7, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD 5, FreeBSD 6
Linux Real TTY Drivers: Linux kernels 2.2.x, 2.4.x, 2.6.x
Authentication: Local user-name and password

Management Software

Utilities: Wireless Search Utility
Configuration and Management Options: SNMP v1/v2c/v3, Web/Telnet/Serial Console, SSH, Remote SMS Control, Auto IP Report
Private IP Solution: OnCell Central Manager

SIM Interface

Number of SIMs: 1
SIM Control: 3 V

Serial Interface

Number of Ports: 1
Serial Standards:
OnCell G3111-HSPA: 1 RS-232 port, DB9 male
OnCell G3151-HSPA: 1 RS-232/422/485 port, DB9 male

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2 (when parity = None)
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
Baudrate: 50 bps to 921.6 kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Physical Characteristics

Housing: Aluminum, providing IP30 protection
Weight: 170 g (0.38 lb)
Dimensions: 77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)

Environmental Limits

Operating Temperature: -30 to 55°C (-22 to 131°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Number of Power Inputs: 1 (terminal block)
Input Voltage: 12 to 48 VDC
Input Current: 0.9 A @ 12 VDC; 0.23 A @ 48 VDC
Reverse Polarity Protection: Present

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24, EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 1 kV; Signal: 1 kV
IEC 61000-4-6 CS: 3 V
IEC 61000-4-8
Radio: FCC Part 22H, FCC Part 24E, EN 301 489-1, EN 301 489-7, EN 301 489-24, EN 301 511, EN 301 908

MTBF (mean time between failures)

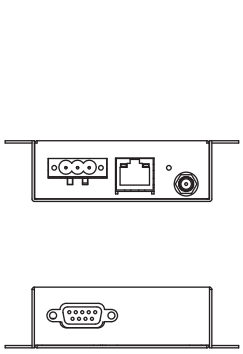
Time: 1,815,281 hrs
Standard: Telcordia SR332

Warranty

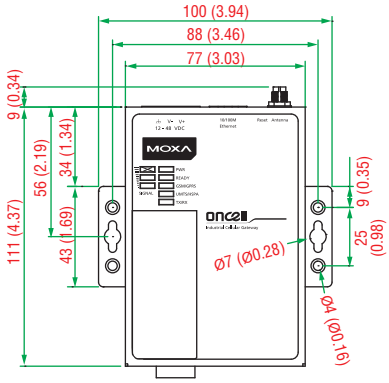
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

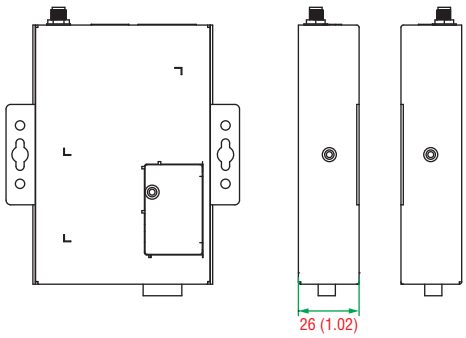
Unit: mm (inch)



Top & Bottom View

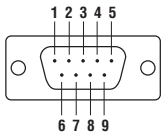


Front & Rear View



Left & Right Side View

DB9 male connector



PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–
9	–	–	–

Ordering Information

Available Models

OnCell G3111-HSPA: 1-port five-band industrial GSM/GPRS/EDGE/UMTS/HSPA IP gateway, RS-232, -30 to 55°C operating temperature
OnCell G3151-HSPA: 1-port five-band industrial GSM/GPRS/EDGE/UMTS/HSPA IP gateway, RS-232/422/485, -30 to 55°C operating temperature

Optional Accessories (can be purchased separately)

ANT-WCDMA-AHSM-04-2.5m: Five-band GSM/GPRS/EDGE/UMTS/HSPA, 4 dBi, omnidirectional magnetic-based antenna
Note: Please visit Moxa's website for a complete list of optional wireless accessories and antennas available for Moxa's wireless products

Package Checklist

- OnCell G31x1-HSPA IP gateway
- 1 UMTS/HSPA antenna: ANT-WCDMA-ASM-1.5
- Rubber stand
- 3-pin terminal block
- DIN-rail kit
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

OnCell G3111/G3151/G3211/G3251

Compact quad-band GSM/GPRS IP gateways

- Universal quad-band GSM/GPRS 850/900/1800/1900 MHz
- Desktop or DIN-rail installation
- Connect Ethernet and serial devices
- Centralize private IP management software with OnCell Central Manager
- Choice of configuration methods, including web console, serial console, and Telnet

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Overview

The OnCell G3111/G3151/G3211/G3251 are cellular IP gateways that can conveniently and transparently connect up to two devices to a cellular network, allowing you to connect serial devices to your existing Ethernet with only basic configuration. To ensure zero data loss and on-demand cellular communication, OnCell devices are integrated with the GuaranLink function. The G3111/G3151/G3211/G3251 cellular IP gateways are compact, and can be used on a desktop or mounted on a DIN rail. The products come with a 12 to 48 VDC power input and have 2 kV EFT/Surge protection to allow the use of different types of field power sources. The serial ports are also protected by 15 kV ESD line protection to keep your system safe from unexpected electrical discharges.

Specifications

Cellular Interface

Standards: GSM/GPRS
Band Options: Quad-band 850/900/1800/1900 MHz
GPRS Multi-slot Class: Class 10
GPRS Data Rate: 85.6 kbps DL, 43 kbps UL
GPRS Terminal Device Class: Class B
GPRS Coding Schemes: CS1 to CS4
Tx Power:
GSM1800/1900: 1 W
EGSM850/900: 2 W

LAN Interface

Number of Ports: 1
Ethernet: 10/100 Mbps, RJ45 connector, auto MDI/MDIX

Interface

Cellular Antenna Connectors: 1, SMA (female)

Software

Network Protocols: ARP, DDNS, DHCP/BOOTP, DNS Relay, HTTP, HTTPS, ICMP, SMTP, SNTP, SSH, SSL, TCP/IP, Telnet, UDP
Routing/Firewall: NAT, port forwarding, WAN IP filtering
Cellular Connectivity: GuaranLink
Serial Security: Accessible IP list
Serial Operation Modes: Real COM, Reverse Real COM, TCP Server, TCP Client, UDP, SMS Tunnel, RFC2217, Ethernet Modem
Windows Real COM Drivers: Windows 2000/XP/2003/Vista/Server 2008, Windows XP/2003/Vista/Server 2008 x64
Fixed TTY Drivers: SCO Unix, SCO OpenServer 5, SCO OpenServer 6, UnixWare 7, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD 5, FreeBSD 6
Linux Real TTY Drivers: Linux kernels 2.2.x, 2.4.x, 2.6.x
Authentication: Local user-name and password

Management Software

Utilities: OnCell Search Utility
Configuration and Management Options: SNMP v1/v2c/v3, Web/Telnet/Serial Console, SSH, Remote SMS Control, Auto IP Report
Private IP Solution: OnCell Central Manager

SIM Interface

Number of SIMs: 1
SIM Control: 3 V

Serial Interface

Number of Ports: 1 or 2
Serial Standards:
OnCell G3111: 1 RS-232 port, DB9 male
OnCell G3151: 1 RS-232/422/485 port, DB9 male
OnCell G3211: 2 RS-232 port, DB9 male
OnCell G3251: 2 RS-232/422/485 port, DB9 male

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2 (when parity = None)
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
Baudrate: 50 bps to 921.6 kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Physical Characteristics

Housing: Aluminum, providing IP30 protection

Weight:
OnCell G3111/G3151: 170 g (0.38 lb)
OnCell G3211/G3251: 190 g (0.42 lb)
Dimensions: 77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)

Environmental Limits

Operating Temperature: -30 to 55°C (-22 to 131°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Number of Power Inputs: 1 power jack
Input Voltage: 12 to 48 VDC
Input Current: 0.9 A @ 12 VDC; 0.23 A @ 48 VDC

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A

EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power 1 kV; Signal: 1 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Radio: FCC Part 22H, FCC Part 24E, EN 301 489-1, EN 301 489-7, EN 301 511, PTCRB (OnCell G3151 only)

MTBF (mean time between failures)

Time:
OnCell G3111: 664,000 hrs
OnCell G3151: 661,000 hrs
OnCell G3211: 647,000 hrs
OnCell G3251: 642,000 hrs
Standard: Telcordia SR332

Warranty

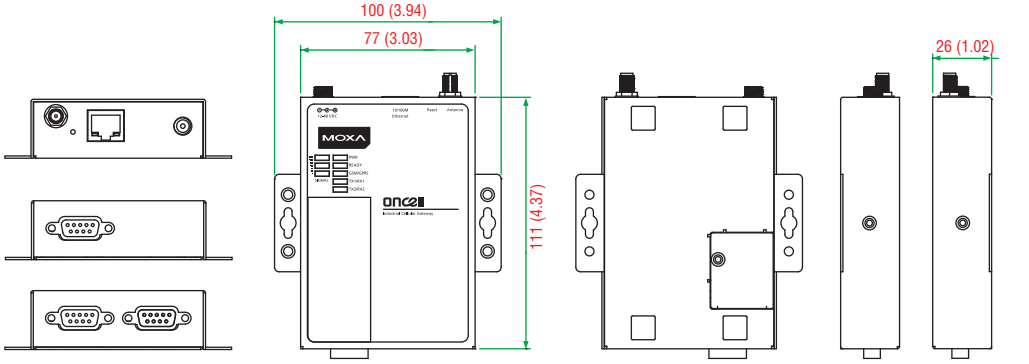
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

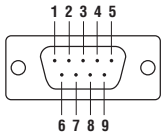
OnCell G3111, OnCell G3151

OnCell G3211, OnCell G3251



Top & Bottom View | Front & Rear View | Left & Right Side View

DB9 male connector



PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–
9	–	–	–

Ordering Information

Available Models

OnCell G3111: 1-port quad-band industrial GSM/GPRS IP gateway, RS-232, -30 to 55°C operating temperature
OnCell G3151: 1-port quad-band industrial GSM/GPRS IP gateway, RS-232/422/485, -30 to 55°C operating temperature
OnCell G3211: 2-port quad-band industrial GSM/GPRS IP gateway, RS-232, -30 to 55°C operating temperature
OnCell G3251: 2-port quad-band industrial GSM/GPRS IP gateway, RS-232/422/485, -30 to 55°C operating temperature
Note: Please visit Moxa's website for a complete list of optional wireless accessories and antennas available for Moxa's wireless products.

Package Checklist

- OnCell G3xx1 IP gateway
- 1 GSM/GPRS antenna: ANT-CQB-ASM-01
- Rubber stand
- DC power supply (screw-on type)
- DIN-rail kit
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Note: An activated SIM card (not included) must be provided by a third party Cellular Service Provider.

OnCell G2111/G2151I

Industrial quad-band GSM/GPRS modems

- Quad-band GSM/GPRS 850/900/1800/1900 MHz
- DIN-rail housing and wall-mounting housing
- 2.5 kV RMS isolation for 1 min. for all serial signals (G2151I only)
- LED indicators for GSM/GPRS and data transmission status
- Extended operating temperature from -25 to 70°C (G2111-T only)

Overview

The OnCell G2111/G2151I series of industrial quad-band GSM/GPRS modems are designed to transmit data and short messages (SMS) over GSM/GPRS mobile networks. The modems can be used to increase the efficiency of maintenance and communication, but do not require extensive training. In addition, the modems can be mounted on a DIN rail or wall. The OnCell G2111/G2151I series modems accept a 12 to 48 VDC power input, making them suitable for use with a variety of field power sources. The serial ports feature 15 kV ESD line protection to protect the products from harmful electrical discharge, and separate RS-232 and RS-422/485 interfaces are built into the OnCell G2151I, each with 2.5 kV RMS isolation protection for one minute. The two serial interfaces on the OnCell G2151I make it ideal for attaching all kinds of devices, such as stand-alone controllers, PC COM ports, and multi-dropped electric meters. In addition, the OnCell G2111-T has an extended operating temperature (-25 to 70°C) design that makes it suitable for heavy industrial use.

Specifications

Cellular Interface

Standards: GSM/GPRS
Band Options: Quad-band 850/900/1800/1900 MHz
GPRS Multi-slot Class: Class 10
GPRS Terminal Device Class: Class B
GPRS Coding Schemes: CS1 to CS4
CSD Data Transmission Rate: Up to 14,400 bps
Tx Power:
GSM 1800/1900: 1 W
EGSM 900/GSM 850: 2 W

Interface

Cellular Antenna Connectors: 1, SMA (female)

SIM Interface

Number of SIMs: 1
SIM Control: 3 V

Serial Interface

Number of Ports: 1
Serial Standards:
OnCell G2111: RS-232 (DB9 female connector)
OnCell G2111-T: RS-232 (DB9 female connector)
OnCell G2151I: RS-232 (DB9 female connector), RS-422/485 (5-pin terminal block connector)
ESD Protection: 15 kV (G2111 only)
Optical Isolation: 2.5 kV (G2151I only)

Serial Communication Parameters

Data Bits: 8
Stop Bits: 1
Parity: None
Flow Control: RTS/CTS
Baudrate: 300 bps to 230.4 kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, RI, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Physical Characteristics

Housing: ABS + PC, providing IP30 protection
Weight: 155 g (0.34 lb)
Dimensions: 27 x 123 x 79 mm (1.06 x 4.84 x 3.11 in)

Environmental Limits

Operating Temperature:
OnCell G2111/G2151I: -20 to 55°C (-4 to 131°F)
OnCell G2111-T: -25 to 70°C (-22 to 158°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Number of Power Inputs: 1 (terminal block)
Input Voltage: 12 to 48 VDC
Input Current: 0.625 A @ 12 VDC; 0.16 A @ 48 VDC

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 0.5 kV
IEC 61000-4-5 Surge: Power: 1 kV
IEC 61000-4-6 CS: 3 V
IEC 61000-4-8
Radio: FCC Part 22H, FCC Part 24E, EN 301 489-1, EN 301 489-7, EN 301 511

MTBF (mean time between failures)

Time:
OnCell G2111/G2111-T: 925,000 hrs
OnCell G2151I: 864,000 hrs
Standard: Telcordia SR332

Warranty

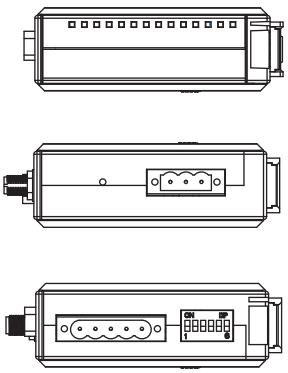
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

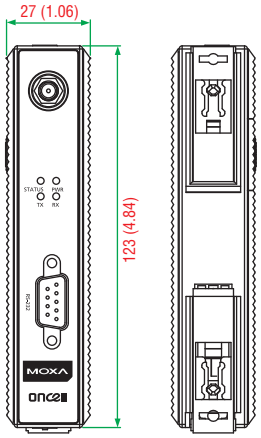
Unit: mm (inch)

OnCell G2111

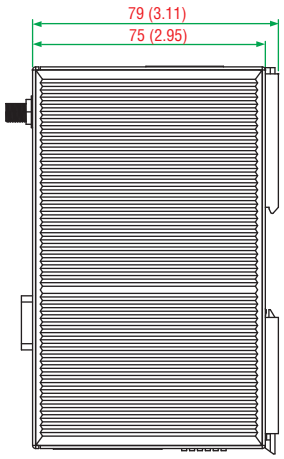
OnCell G2151I



Top & Bottom View

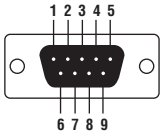


Front & Rear View



Side View

DB9 female RS-232 port



PIN	RS-232
1	DCD
2	TxD
3	RxD
4	DSR
5	GND
6	DTR
7	CTS
8	RTS

Ordering Information

Available Models

OnCell G2111: 1-port RS-232 GSM/GPRS IP modem, -20 to 55°C operating temperature
OnCell G2151I: 1-port RS-232/422/485 GSM/GPRS IP modem, isolation, -20 to 55°C operating temperature
OnCell G2111-T: 1-port RS-232 GSM/GPRS IP modem, -25 to 70°C operating temperature
Note: Please visit Moxa's website for a complete list of optional wireless accessories and antennas available for Moxa's wireless products.

Package Checklist

- OnCell G21x1 cellular modem
- 1 GSM/GPRS antenna: ANT-CQB-AHSM-00-3m
- Terminal block adapter for power jack connector
- Documentation CD
- Quick installation guide (printed)
- Warranty card

Note: An activated SIM card (not included) must be provided by a third party Cellular Service Provider.

Cellular Accessories

	UMTS/LTE Cellular Antennas		GSM/GPRS Cellular Antennas			
	ANT-LTE-ASM-02	ANT-LTEUS-ASM-01	ANT-CQB-ASM-01	ANT-CQB-AHSM-00-3m	ANT-CQB-AHSM-03-3m	ANT-CQB-AHSM-05-3m
Frequency Range	850/900/1700/2100/2300/2600 MHz	700/850/900/1700/2100/2300/2600 MHz	850/900/1800/1900 MHz	850/900/1800/1900 MHz	850/900/1800/1900 MHz	850/900/1800/1900 MHz
Description	GSM/GPRS/UMTS/LTE band, Omni-direction, 2 dBi, rubber SMA	GSM/GPRS/UMTS/LTE band, omnidirectional, 2 dBi, rubber SMA	Quad-band GSM/GPRS, omnidirectional, 1 dBi, rubber SMA	Quad-band GSM/GPRS, omnidirectional, 0 dBi, 10 cm high, magnetic SMA, 3 m	Quad-band GSM/GPRS, omnidirectional, 3 dBi, 25 cm high, magnetic SMA, 3 m	Quad-band GSM/GPRS, omnidirectional, 5 dBi, 37 cm high, magnetic SMA, 3 m
Antenna Type	Omnidirectional	Omnidirectional	Omnidirectional	Omnidirectional	Omnidirectional	Omnidirectional
Cable Type	–	–	–	RG174/U	RG174/U	RG174/U
Typical Antenna Gain	2 dBi	1 dBi	1 dBi (Max.)	0 dBi	3 dBi	5 dBi
Impedance	50 ohms	50 ohms	50 ohms	50 ohms	50 ohms	50 ohms
Polarization Type	Linear	Linear	Linear	Linear	Linear	Linear
HPBW/horizontal	360°	360°	360°	360°	360°	360°
V.S.W.R.	<1.5	<1.5	< 3.5	< 2	< 2	< 2
Connector(s)	SMA (male)	SMA (male)	SMA (male)	SMA (male)	SMA (male)	SMA (male)
Antenna Length	161 mm (6.34 in)	205 mm (8.07 in)	83 mm (3.27 in)	100 mm (3.94 in)	250 mm (9.84 in)	370 mm (14.57 in)
Weight	29 g (0.06 lb)	26 g (0.06 lb)	10 g (0.02 lb)	58 g (0.13 lb)	60 g (0.13 lb)	62 g (0.14 lb)
Cable Length	–	–	–	3 m (118.11 in)	3 m (118.11 in)	3 m (118.11 in)
Related Products	WDR-3124A, OnCell 5004-HSPA/5104-HSPA, OnCell G3470A-LTE, OnCell G3110-HSPA/3150-HSPA, OnCell G3110/G3150, OnCell G3111-HSPA/G3151-HSPA, OnCell G3111/G3151/G3211/G3251, OnCell G2111/2511I		OnCell G2111/G2151I, OnCell G3111/G3151, OnCell G3211/G3251, OnCell G3110/G3150, OnCell 5000 series, ioLogik W5340/5312			

	UMTS/HSPA Cellular Antennas			Cellular Cables
	ANT-WCDMA-ASM-1.5	ANT-WCDMA-AHSM-04-2.5m	ANT-WCDMA-ANF-00	CRF-SMA(M)/N(M)-300
Frequency Range	850/900/1800/1900/2100 MHz	850/900/1800/1900/2100 MHz	850/900/1800/1900/2100 MHz	–
Description	Five-band GSM/GPRS/UMTS/HSDPA/HSPA, omnidirectional, 1.5 dBi, rubber SMA	Five-band GSM/GPRS/UMTS/HSDPA/HSPA, omnidirectional, 4 dBi, 11 cm high, magnetic SMA, 2.5 m	Five-band GSM/GPRS/UMTS/HSDPA/HSPA+, omnidirectional, 0 dBi, glass fiber, N-type (female)	CFD200 cable, SMA male to N-type (male), 3 m
Antenna Type	Omnidirectional	Omnidirectional	Omnidirectional	–
Cable Type	–	RG174/U	–	CFD200
Typical Antenna Gain	1.5 dBi	4 dBi	0 dBi	–
Impedance	50 ohms	50 ohms	50±5 ohms	–
Polarization Type	Vertical	Vertical	Vertical	–
HPBW/horizontal	360°	360°	360°	–
HPBW/vertical	–	–	40°	–
V.S.W.R.	< 2	< 2	1 : 1.5 Max.	–
Connector(s)	SMA (male)	SMA (male)	N-type Female	SMA male to N-type male
Antenna Length	104 mm (4.09 in)	110 mm (4.33 in)	420 mm (16.54 in)	–
Weight	10 g (0.02 lb)	60 g (0.13 lb)	430 g (0.95 lb)	–
Cable Length	–	2.5 m (98.43 in)	–	3 m (118.11 in)
Outer Dimension	–	–	–	4.14 mm (0.16 in)
Min. Bend Radius	–	–	–	12.7 mm (0.5 in)
Attenuation (dB/100m)	–	–	–	32.6 @ 900 MHz 49.3 @ 2000 MHz
Related Accessory	–	–	–	Cellular 5-band N-type antenna
Related Products	WDR-3124A, OnCell G3100-HSPA series, OnCell G3111-HSPA/G3151-HSPA, OnCell G3110-HSPA/G3150-HSPA, OnCell 5004-HSPA/5104-HSPA, ioLogik W5340-HSDPA			

OnCell Central Manager Software

Centralized private IP management software

> **Looking for an easy way to access network devices with private IP addresses over the Internet? Moxa's OnCell Central Manager offers an industrial-grade centralized solution that allows you to configure, manage, and monitor remote devices on a private network, over the web.**

Introduction

Due to the limited number of public IP addresses, most cellular service providers only offer private IP addresses for mobile devices to connect to the Internet. However, the nature of private IP addresses can make it extremely difficult to access your cellular devices from a public network. This is where OnCell Central Manager comes in. OnCell Central Manager stands between you and your cellular devices and allows you to access your devices from anywhere on the Internet. Installation is easy:

Step 1: Install OnCell Central Manager on your server
Step 2: Configure the OnCell device
Step 3: Manage and monitor your devices

By providing a central point of access to remote devices, OnCell Central Manager makes it easy for you to manage multiple devices. Using a standard Web browser, you can securely make configuration changes to a device, manage devices, and monitor device status. OnCell Central Manager helps you reduce maintenance costs; since you can diagnose and solve problems from a central site you won't need to make as many trips to remote locations. OnCell Central Manager can be hosted at a customer's central data center or through a Moxa partner's server, and can be accessed securely from anywhere across a wired or wireless IP network, including the Internet.

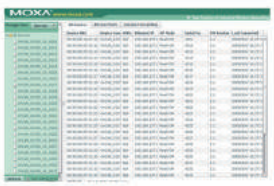
Features

Device Maintenance

Manage and perform administrative tasks such as importing and exporting device configurations, and resetting device settings.

Device Monitoring

With the device and connection monitoring features, you can get up-to-date information about a device's network activity, connection status, and more.



Telnet

OnCell Central Manager allows you to open or close a Telnet connection for remote monitoring and configuration.

System Requirements

Hardward Requirements

Your host hardware must meet the following minimum requirements:

- Intel® Core™ i3 Processor or above (2 GHz)
- 2 GB RAM and 2 or more GB of disk space

Software Requirements

OnCell Manager supports the following operating systems: Microsoft Windows Server 2003/2008

Note: Adobe Flash Player Software is required for the installation of OnCell Central Manager

Supported Products

OnCell Central Manager can be used with the following Moxa products: OnCell G3470A-LTE, WDR-3124A, OnCell 5004-HSPA/5104-HSPA, OnCell G3110-HSPA/G3150-HSPA, OnCell G3111-HSPA/G3151-HSPA, OnCell G3110/G3150, OnCell G3111/G3211/G3151/G3251

Note: OnCell Central Manager can be downloaded for free from Moxa's website.

Railway Wireless LAN Solutions

Product Selection Guide

Railway Wireless LAN Solutions 8-2

Introduction

Introduction to Railway Wireless LAN. 8-3

Train to Ground

TAP-6226 Series: Railway trackside 802.11a/b/g IP68 wireless unit 8-4

AWK-3121-RTG Series: Industrial IEEE 802.11a/b/g wireless AP/client. 8-6

WAC-1001 Series: Industrial wireless access controller 8-9

WAC-2004 Series: Industrial wireless access controller 8-11

Carriage to Carriage

AWK-3131-RCC Series: Industrial IEEE 802.11a/b/g/n wireless AP/bridge/client 8-13

AWK-5232-RCC Series: Industrial IEEE 802.11a/b/g/n dual-radio wireless AP/bridge/client 8-16

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Railway Wireless LAN Solutions

Railway Wireless LAN Solutions

	Rail Train-to-Ground Series				Rail Carriage-to-Carriage Series	
	TAP-6226	AWK-3121-M12-RTG	AWK-3121-M12-HP-RTG	AWK-3121-SSC-RTG	AWK-3131-M12-RCC	AWK-5232-M12-RCC
WLAN						
IEEE 802.11 Standards	a/b/g	a/b/g			a/b/g/n	
Number of RF Modules	2	1	1	1	1	2
High Power RF Modules	✓	–	✓	–	–	–
Interfaces						
Number of Antenna Connectors	2	2	2	2	2	4
Antenna Connector Type	N-type (female)	QMA (female)	QMA (female)	RP-SMA (female)	QMA (female)	QMA (female)
Number of LAN Ports	6	1	1	1	1	2
LAN Port Type	4, M12; 2, SFP	1, M12	1, M12	1, SC connector	1, M12	2, M12
LAN Port Speed	10/100BaseT(X); 100BaseFX	10/100BaseT(X)	10/100BaseT(X)	100BaseFX	10/100/1000BaseT(X)	10/100/1000BaseT(X)
RS-232 Console Port	1, M12	1, RJ45	1, RJ45	1, RJ45	1, RJ45	1, RJ45
DI/DO	–	✓	✓	✓	✓	✓
DI/DO Connector Type	–	10-pin terminal block	10-pin terminal block	10-pin terminal block	10-pin terminal block	10-pin terminal block
Hosuing Protection						
IP-rating	IP68	IP30	IP30	IP30	IP30	IP30
Installation Options						
DIN-Rail Mounting	–	✓	✓	✓	✓	✓
Wall Mounting	✓	✓ (optional)	✓ (optional)	✓ (optional)	✓ (optional)	✓ (optional)
Power Requirements						
Input Voltage	110/220 VDC/VAC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC
Connector	M23	10-pin terminal block	10-pin terminal block	10-pin terminal block	10-pin terminal block	10-pin terminal block
PoE Support	✓	✓	✓	✓	✓	✓
Reserve Polarity Protection	✓	✓	✓	✓	✓	✓
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	Wireless Access Controller	
	WAC-1001	WAC-2004
Controller Features		
WLAN Security Support	WPA/WAP2-Personal and Enterprise	WPA/WAP2-Personal and Enterprise
Turbo Roaming for Layer 2 Network	✓	✓
Turbo Roaming for Layer 3 Network	–	✓
Mobile IP	–	✓
Interfaces		
Number of LAN Ports	1	4
LAN Port Type	1, RJ45	4, RJ45
LAN Port Speed	10/100BaseT(X)	10/100/1000BaseT(X)
RS-232 Console Port	1, RJ45	1, DB9 (male)
DI/DO	✓	–
DI/DO Connector Type	10-pin terminal block	–
Hosuing Protection		
IP-rating	IP30	–
Installation Options		
DIN-Rail Mounting	✓	–
Wall Mounting	✓ (optional)	–
Rack Mounting	–	Standard 19-inch rack mounting
Power Requirements		
Input Voltage	12 to 48 VDC	100 to 240 VAC
Connector	10-pin terminal block	AC power socket
PoE Support	✓	–
Reserve Polarity Protection	✓	–
Page	8-9	8-11

Introduction to Railway Wireless LAN

Recent advancements in wireless technologies have made mission-critical mobile networks, such as railway train-to-ground applications, a reality. In addition, increasing passenger expectations to be able to use various personal mobile devices while in transit have also prompted railways to invest in onboard Wi-Fi technologies.

However, electrical equipment used in railway applications are also subject to strict industry standards. In particular, wireless equipment used aboard rolling stock need to comply with the EN 50155 standard, which requires an extremely rugged design to resist power input voltage fluctuations, power surges, ESD, and continuous vibrations.

Rail Signaling

In order to create train control systems that are more efficient than traditional track circuit systems, CBTC signaling systems need continuous bi-directional track-to-train data links that use radio communications. These requirements are especially important in high-speed applications, for which roaming occurs very often, but moving block signaling systems still need sustained communications between fixed and mobile equipment. However, WLAN handoffs may affect latency and cause disruptions in communications that is unacceptable for safety-critical applications.

Onboard Infotainment

Today, rail operators can improve passenger experience by offering onboard multimedia content, free Internet connectivity, and complete network security throughout the entire train. The infotainment network must be flexible enough to adapt to train consist changes during daily operations, while communicating to the ground-based backbone network through radio links, or to the control center through a satellite connection.

Besides, with the increasing demand on onboard Wi-Fi access, wireless APs need tailor-made features to ensure that every passenger is able to access multimedia stations or the Internet. This kind of service requires greater bandwidth, and secure network access, especially when connecting with backbone systems.

Moxa EN 50155-Compliant WLAN Solutions

Moxa provides three EN 50155-compliant product series for various railway applications:

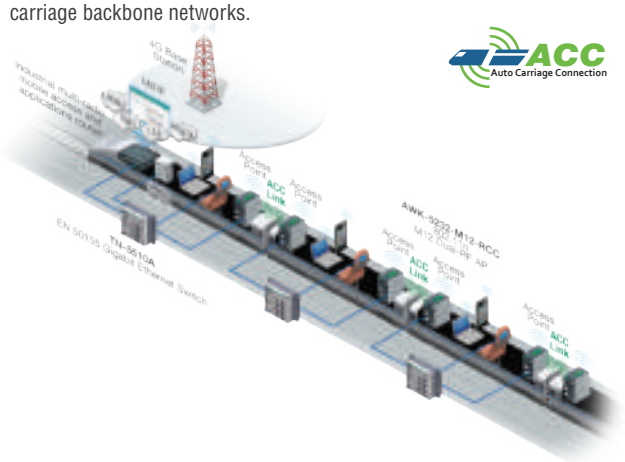
- Rail Train-to-Ground (RTG) series and TAP series for train-to-ground communications
- Wireless Access Controller (WAC) series to work with the RTG series
- Rail Carriage-to-Carriage (RCC) series for onboard wireless communications

Train-to-Ground Communications: Turbo Roaming and AeroLink Protection Technology

Moxa's train-to-ground solution includes wayside access points and onboard wireless client products. Working with a wireless access controller from the WAC series, the innovative Moxa controller-based Turbo Roaming technology ensures millisecond level handoff times to meet the demanding requirements of mission-critical railway applications, such as CBTC. Moreover, the AeroLink Protection technology offers wireless redundancy by creating multiple redundant paths from the train to the ground for a highly reliable connection.

Onboard Communications: ACC Technology and Passenger Wi-Fi

The RCC series includes onboard wireless products for passenger Wi-Fi networks and carriage-to-carriage wireless communication. For Wi-Fi networks onboard, our bandwidth usage optimization features provide a smoother Wi-Fi experience for passengers, even in crowded carriages, and client isolation for a secure network connection. For carriage-to-carriage communications, the innovative Moxa ACC (Auto Carriage Connection) technology supported by the RCC series provides simple wireless deployment and increases the reliability of wireless carriage backbone networks.



TAP-6226 Series

Railway trackside 802.1 a/b/g IP68 wireless unit

- 2 dual-band radios, IEEE 802.11a/b/g compliant
- Railway approved IP68 housing
- Controller-based Turbo Roaming
- 2 fiber SFP ports and 4 PoE ports with M12 LAN connectors
- High transmission power for extended reach
- Complies with a portion of EN 50155 specifications
- -40 to 75°C operating temperature range

Introduction

The TAP-6226 trackside wireless unit is designed for train-to-ground wireless communication. It is a highly compact and rugged wireless unit that integrates two access points, a managed fiber switch, and a wide-range AC/DC power supply, all in one box. The IP68 housing can withstand the harshest weather, and M12 connectors make the unit shock and vibration resistant. The TAP-6226 supports advanced controller-based Turbo Roaming technology for applications such as Communication-Based Train Control (CBTC). The unit can supply power to up to 4 PoE devices while providing reliable LAN communication with Moxa's Turbo Chain technology.

Advanced Mobility and Reliability

- Controller-based L3 Turbo Roaming
- Mobile IP support
- 2 dual-band radios: 2.4 GHz and 5.1 to 5.9 GHz
- Turbo Chain support (100 ms recovery time)
- WPA/WPA2 and 802.11i support
- IEEE 802.1X/RADIUS support

Built for Transportation Applications

- Isolated 110 to 220 VDC/VAC power input
- High transmission power, 400 mW
- Supplies power through 4 PoE ports (PSE)
- 2 fiber SFP ports for backbone installation
- Wide temperature (-40 to 75°C) and IP68 housing

Specifications

WLAN Interface

Standards:
IEEE 802.11a/b/g for Wireless LAN
IEEE 802.11i for Wireless Security
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseTX
IEEE 802.3af for Power-over-Ethernet
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1p for Class of Service
IEEE 802.1Q for VLAN
Spread Spectrum and Modulation (typical):
• DSSS with DBPSK, DQPSK, CCK
• OFDM with BPSK, QPSK, 16QAM, 64QAM
• 802.11b: CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBPSK @ 1 Mbps
• 802.11a/g: 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps
Operating Channels (central frequency):
US:
2.412 to 2.462 GHz (802.11a/b/g, 11 channels)
5.18 to 5.24 GHz (802.11a, 4 channels)
5.26 to 5.825 GHz (optional)
EU:
2.412 to 2.472 GHz (802.11abg, 13 channels)
5.18 to 5.24 GHz (802.11a, 4 channels)
5.26 to 5.825 GHz (optional)
*Special frequency bands (such as 5.9 GHz) is available for customization.

Security:
• SSID broadcast enable/disable
• Firewall for MAC/IP/Protocol/Port-based filtering
• 64-bit and 128-bit WEP encryption, WPA/WPA2-Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP, and AES)
Transmission Rates:
802.11b: 1, 2, 5.5, 11 Mbps
802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
TX Transmit Power:
802.11b:
Typ. 26±1.5 dBm @ 1 to 11 Mbps
802.11g:
Typ. 26±1.5 dBm @ 6 to 24 Mbps, Typ. 25±1.5 dBm @ 36 Mbps, Typ. 24±1.5 dBm @ 48 Mbps, Typ. 23±1.5 dBm @ 54 Mbps
802.11a:
Typ. 26±1.5 dBm @ 6 to Mbps, Typ. 25±1.5 dBm @ 36Mbps, Typ. 24±1.5 dBm @ 48 Mbps, Typ. 23±1.5 dBm @ 54 Mbps
RX Sensitivity:
802.11b:
-97 dBm @ 1 Mbps, -94 dBm @ 2 Mbps, -92 dBm @ 5.5 Mbps, -90 dBm @ 11 Mbps
802.11g:
-93 dBm @ 6 Mbps, -91 dBm @ 9 Mbps, -90 dBm @ 12 Mbps, -88 dBm @ 18 Mbps, -84 dBm @ 24 Mbps, -80 dBm @ 36 Mbps, -76 dBm @ 48 Mbps, -74 dBm @ 54 Mbps
802.11a:
-90 dBm @ 6 Mbps, -89 dBm @ 9 Mbps, -89 dBm @ 12 Mbps, -85 dBm @ 18 Mbps, -83 dBm @ 24 Mbps, -79 dBm @ 36 Mbps, -75 dBm @ 48 Mbps, -74 dBm @ 54 Mbps

Protocol Support

General Protocols: Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNTP, TCP, UDP, RADIUS, SNMP v1/v2/v3, PPPoE, DHCP, STP/RSTP

Interface

Connector for External Antennas: N-type (female)
Fiber Ports: 2, 100BaseSFP slot
Console Port: M12 A-coded 5-pin male connector
LED Indicators: PWR1, PWR2, PoE1-4, FAULT, STATE, HEAD, TAIL, LAN1-6, WLAN1, WLAN2
Fast Ethernet ports: 4, side cabling, M12 D-coded 4-pin female connector, 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection, 802.1af PoE power budget
Fiber Module: 100Base multi-mode 1300 nm wavelength with LC connector for 4 km transmission (50/125 µm or 62.5/125 µm 800 MHz-km @ 1300 nm wavelength)

Physical Characteristics

Housing: Metal, IP68 protection
Weight: 9.7 kg (21.38 lb)
Dimensions: 324 x 279 x 156 mm (12.76 x 10.98 x 6.14 in)
Installation: Wall mounting

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5% to 95% (non-condensing)

Power Requirements

Input Voltage: 110/220 VDC/VAC
Input Current: 0.68 A @ 110 VDC/VAC
Connector: M23
Power Consumption: 74.8 W (max., with PoE ports fully loaded), 15 W (without PoE)
Reverse Polarity Protection: Present
Overload Current Protection: Present

Standards and Certifications

Safety: UL 60950-1, EN 60950-1 (CB)
EMC: EN 55022/24, EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Radio: EN 301 489-1/17, EN 300 328, EN 301 893, FCC ID SLE-WAPA004
Rail Traffic: EN 50155*, EN45545-2, EN 50121-4
*Complies with a portion of EN 50155 specifications.
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

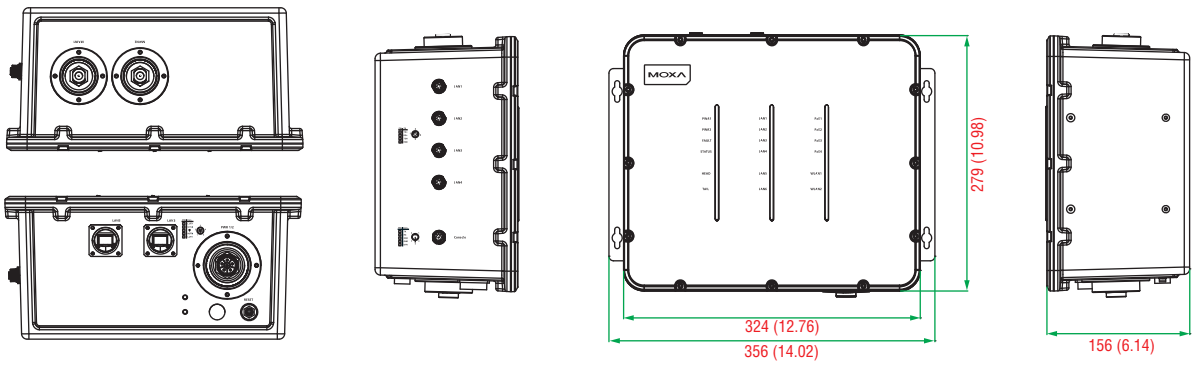
Time: 382,735 hrs
Standard: Telcordia SR332

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

TAP-6226-TC-US-T: Rugged trackside wireless access point, US band
TAP-6226-TC-EU-T: Rugged trackside wireless access point, EU band

Optional Accessories (can be purchased separately)

SFP-1FESLC-T: Small form factor pluggable transceiver with 100Base single-mode, LC connector, 40 km, -40 to 85°C operating temperature
SFP-1FELLC-T: Small form factor pluggable transceiver with 100Base single-mode, LC connector, 80 km, -40 to 85°C operating temperature
CBL-M23 (FF 6P)/OPEN-BK-100 IP67: 1-meter M23 to 6-pin power cable with IP67-rated female 6-pin M23 connector

Package Checklist

- TAP-6226 trackside wireless unit
- 5 protective caps for console port and LAN ports
- Fiber panel-mounting kit
- Wall-mounting kit
- Warranty card

AWK-3121-RTG Series

Industrial IEEE 802.11a/b/g wireless AP/client

- IEEE 802.11a/b/g compliant
- M12 anti-vibration connectors (AWK-3121-M12-RTG and AWK-3121-M12-HP-RTG)
- QoS (WMM) and VLAN for efficient network traffic
- Controller-based Turbo Roaming (handover time < 50 ms @ 3 channels, WPA2); available only when used with the WAC-1001 or WAC-2004
- Supports long-distance data transfer (AWK-3121-M12-HP-RTG)
- Complies with a portion of EN 50155 specifications
- -40 to 75°C operating temperature range (T models)

Introduction

The AWK-3121-RTG 3-in-1 industrial AP/client devices are designed specifically for train-to-ground communication while moving at speeds of up to 120 km/h. The AWK-3121-RTG complies with a portion of EN 50155 specifications, covering operating temperature, power input voltage, surge, ESD, and vibration, making the products suitable for a variety of industrial applications. Installation is easy, with either DIN-rail mounting or distribution boxes, and the DIN-rail mounting capability, wide operating temperature range, and IP30 housing with LED indicators make the AWK-3121-RTG a convenient yet reliable solution for any rolling stock application.

Advanced Security

- 64-bit and 128-bit WEP (Wired Equivalent Privacy)
- Enable/disable SSID broadcasts
- WPA/WPA2 (Wi-Fi Protected Access) and 802.11i support
- IEEE802.1X/RADIUS support
- Powerful filters for access control

Specifications for Train-to-Ground Applications

- Client-based Turbo Roaming handover time
  < 150 ms @ 1 channel with WPA2
  < 350 ms @ 3 channels with WPA2
- Controller-based Turbo Roaming handover time (available only when used with the WAC-1001 or WAC-2004)
  < 50 ms @ 3 channels with WPA2
- Multiple roaming parameters for different installation structures and antenna types

Specifications

WLAN Interface

Standards:
IEEE 802.11a/b/g for Wireless LAN
IEEE 802.11i for Wireless Security
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseTX
IEEE 802.3af for Power-over-Ethernet
Spread Spectrum and Modulation (typical):
• DSSS with DBPSK, DQPSK, CCK
• OFDM with BPSK, QPSK, 16QAM, 64QAM
• 802.11b: CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBPSK @ 1 Mbps
• 802.11a/g: 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps
Operating Channels (central frequency):
US:
2.412 to 2.462 GHz (11 channels)
5.18 to 5.24 GHz (4 channels)
5.26 to 5.825 GHz (optional)
EU:
2.412 to 2.472 GHz (13 channels)
5.18 to 5.24 GHz (4 channels)
5.26 to 5.825 GHz (optional)
*Special bands, such as 5.9 GHz, are customizable.

Security:
• SSID broadcast enable/disable
• Firewall for MAC/IP/Protocol/Port-based filtering
• 64-bit and 128-bit WEP encryption, WPA/WPA2-Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP, and AES)
Transmission Rates:
802.11b: 1, 2, 5.5, 11 Mbps
802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
TX Transmit Power:
AWK-3121-M12-RTG and AWK-3121-SSC-RTG:
802.11b:
Typ. 23±1.5 dBm @ 1 to 11 Mbps
802.11g:
Typ. 20±1.5 dBm @ 6 to 24 Mbps, Typ. 19±1.5 dBm @ 36 Mbps, Typ. 18±1.5 dBm @ 48 Mbps, Typ. 17±1.5 dBm @ 54 Mbps
802.11a:
Typ. 18±1.5 dBm @ 6 to 24 Mbps, Typ. 16±1.5 dBm @ 36 to 48 Mbps, Typ. 15±1.5 dBm @ 54 Mbps
AWK-3121-M12-HP-RTG:
802.11b:
Typ. 26±1.5 dBm @ 1 to 11 Mbps
802.11g:
Typ. 26±1.5 dBm @ 6 to 24 Mbps, Typ. 25±1.5 dBm @ 36 Mbps, Typ. 24±1.5 dBm @ 48 Mbps, Typ. 23±1.5 dBm @ 54 Mbps

802.11a:
Typ. 26±1.5 dBm @ 6 to 24 Mbps, Typ. 25±1.5 dBm @ 36 Mbps, Typ. 24±1.5 dBm @ 48 Mbps, Typ. 23±1.5 dBm @ 54 Mbps
RX Sensitivity:
802.11b:
-97 dBm @ 1 Mbps, -94 dBm @ 2 Mbps, -92 dBm @ 5.5 Mbps, -90 dBm @ 11 Mbps
802.11g:
-93 dBm @ 6 Mbps, -91 dBm @ 9 Mbps, -90 dBm @ 12 Mbps, -88 dBm @ 18 Mbps, -84 dBm @ 24 Mbps, -80 dBm @ 36 Mbps, -76 dBm @ 48 Mbps, -74 dBm @ 54 Mbps
802.11a:
-90 dBm @ 6 Mbps, -89 dBm @ 9 Mbps, -89 dBm @ 12 Mbps, -85 dBm @ 18 Mbps, -83 dBm @ 24 Mbps, -79 dBm @ 36 Mbps, -75 dBm @ 48 Mbps, -74 dBm @ 54 Mbps

Protocol Support

General Protocols: Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNTP, TCP, UDP, RADIUS, SNMP, PPPoE, DHCP

Interface

Connector for External Antennas:
AWK-3121-SSC-RTG: RP-SMA (female)
AWK-3121-M12-RTG and AWK-3121-M12-HP-RTG: QMA (female)
Fiber Ports: 1, 100BaseFX port (SC connector, AWK-3121-SSC-RTG only)
M12 Ports: 1, 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X female connection (AWK-3121-M12-RTG and AWK-3121-M12-HP-RTG only)
Console Port: RS-232 (RJ45-type)
LED Indicators: PWR1, PWR2, PoE*, FAULT, STATE, signal strength, CLIENT MODE, WLAN, 10/100 (M12 port), 100M (fiber port)
*PoE is only available for the AWK-3121-M12-RTG and AWK-3121-M12-HP-RTG
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 electrically isolated inputs
• +13 to +30 V for state "1"
• +3 to -30 V for state "0"
• Max. input current: 8 mA
Default Antennas*:
2 dual-band omni-directional antennas, 2 dBi, RP-SMA (male)
*Only available with the AWK-3121-SSC-RTG models.

Optical Fiber*

	100BaseFX
	Single Mode
Wavelength	1310 nm
Max. TX	0 dBm
Min. TX	-5 dBm
RX Sensitivity	-34 dBm
Link Budget	29 dB
Typical Distance	40 km[a]
Saturation	-3 dBm

* Only available for AWK-3121-SSC models

Physical Characteristics

Housing: Metal, IP30 protection
Weight: 850 g (1.87 lb)
Dimensions: 53 x 135 x 105 mm (2.08 x 5.31 x 4.13 in)
Installation: DIN-rail mounting, wall mounting (optional)

Environmental Limits

Operating Temperature:
Standard Models: -25 to 60°C (-13 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5% to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC, redundant dual DC power inputs or 48 VDC Power-over-Ethernet (IEEE 802.3af compliant)
Input Current: 0.5 A @ 12 VDC; 0.2 A @ 48 VDC
Connector: 10-pin removable terminal block
Reverse Polarity Protection: Present

Standards and Certifications

Safety: UL 60950-1, IEC 60950-1(CB)
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Radio: EN 301 489-1/17, EN 300 328, EN 301 893, FCC ID SLE-WAPA003 (AWK-3121-M12-RTG), FCC ID SLE-WAPA004 (AWK-3121-M12-HP-RTG)
Rail Traffic: EN 50155*, EN45545-2, EN 50121-4
*Complies with a portion of EN 50155 specifications.

MTBF (mean time between failures)

Time:
AWK-3121-M12-RTG: 480,831 hrs
AWK-3121-M12-HP-RTG: 447,861 hrs
AWK-3121-SSC-RTG: 445,913 hrs
Standard: Telcordia SR332

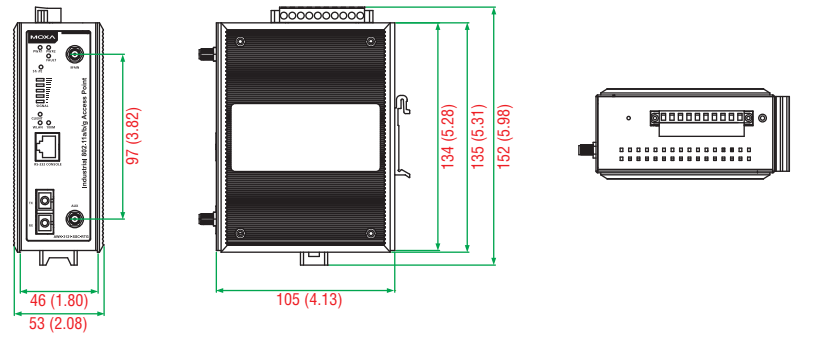
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

AWK-3121-SSC-RTG

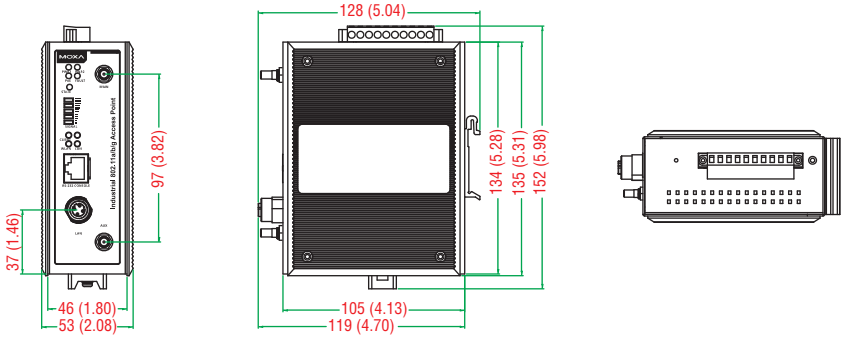


Front View Side View Top View

Dimensions

AWK-3121-M12-RTG and AWK-3121-M12-HP-RTG

Unit: mm (inch)



Front View | Side View | Top View

Ordering Information

Available Models			Port Interface		Antenna Interface			
Model Name	Standard Temperature (-25 to 60°C)	Wide Temperature (-40 to 75°C)	PoE, 10/100 BaseT(X) M12 Connector	100BaseFX Single-Mode SC Connector	RP-SMA	QMA	Conformal Coating	High Power
AWK-3121-M12-RTG								
AWK-3121-M12-RTG-US	✓	–	✓	–	–	✓	–	–
AWK-3121-M12-RTG-EU	✓	–	✓	–	–	✓	–	–
AWK-3121-M12-RTG-US-T	–	✓	✓	–	–	✓	–	–
AWK-3121-M12-RTG-EU-T	–	✓	✓	–	–	✓	–	–
AWK-3121-M12-RTG-US-CT	✓	–	✓	–	–	✓	✓	–
AWK-3121-M12-RTG-EU-CT	✓	–	✓	–	–	✓	✓	–
AWK-3121-M12-RTG-US-CT-T	–	✓	✓	–	–	✓	✓	–
AWK-3121-M12-RTG-EU-CT-T	–	✓	✓	–	–	✓	✓	–
AWK-3121-M12-HP-RTG								
AWK-3121-M12-HP-RTG-US	✓	–	✓	–	–	✓	–	✓
AWK-3121-M12-HP-RTG-EU	✓	–	✓	–	–	✓	–	✓
AWK-3121-M12-HP-RTG-US-T	–	✓	✓	–	–	✓	–	✓
AWK-3121-M12-HP-RTG-EU-T	–	✓	✓	–	–	✓	–	✓
AWK-3121-M12-HP-RTG-US-CT	✓	–	✓	–	–	✓	✓	✓
AWK-3121-M12-HP-RTG-EU-CT	✓	–	✓	–	–	✓	✓	✓
AWK-3121-M12-HP-RTG-US-CT-T	–	✓	✓	–	–	✓	✓	✓
AWK-3121-M12-HP-RTG-EU-CT-T	–	✓	✓	–	–	✓	✓	✓
AWK-3121-SSC-RTG								
AWK-3121-SSC-RTG-US	✓	–	–	✓	✓	–	–	–
AWK-3121-SSC-RTG-EU	✓	–	–	✓	✓	–	–	–
AWK-3121-SSC-RTG-US-T	–	✓	–	✓	✓	–	–	–
AWK-3121-SSC-RTG-EU-T	–	✓	–	✓	✓	–	–	–

Note:
US: USA band
EU: Europe band
HP: high power
CT: conformal coating

Note: Please visit Moxa's website for a complete list of optional wireless accessories and antennas available for Moxa's wireless products.

Package Checklist

- AWK-3121-RTG wireless AP/bridge/client
- DIN-rail kit
- 1 plastic RJ45 protective cap for console port
- 1 plastic protective cap for fiber port (AWK-3121-SSC-RTG only)
- 2 2.4/5 GHz antennas: ANT-WDB-ARM-02 (AWK-3121-SSC-RTG only)
- Cable holder with 1 screw
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

WAC-1001 Series

Industrial wireless access controller

- Redundant 12 to 48 VDC power inputs
- Controller-based Turbo Roaming (less than 50 ms)
- Supported models: AWK-RTG series
- IEEE 802.11i-compliant wireless security
- DIN-rail or wall mounting (optional) for onsite installation
- -40 to 75°C operating temperature range (T model)

Introduction

The goal of zero-latency-roaming is to create networks that maintain seamless communications as clients switch from one access point to another. As part of its AWK-RTG series, Moxa has introduced the WAC-1001 wireless access controller that uses controller-based Turbo Roaming to achieve less than 50 ms roaming on three channels. This advanced roaming capability securely hands off clients at speeds so high that wireless clients can enjoy seamless roaming between APs, with virtually no interruption in connectivity.

Maximum Availability

- Enables millisecond level Turbo Roaming
- Configuration back-up
- Dual redundant DC power inputs

Advanced Security

- IEEE802.1X/RADIUS supported
- WPA/WPA2/802.11i supported
- Integrated DI/DO for on-site monitoring and warnings

Specifications

WLAN Interface

Standards:
IEEE 802.11i for Wireless Security
IEEE 802.3u for 10/100/1000BaseT(X)
IEEE 802.3af for Power-over-Ethernet
Security: WPA/WPA2-Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP, and AES)

LAN Interface

Standards:
IEEE 802.1x (Radius client)
IEEE 802.3u for 10/100/1000BaseT(X)
IEEE 802.3af for Power-over-Ethernet

Interface

LAN Port: 10/100/1000BaseT(X), auto negotiation speed (RJ45-type)
Console Port: RS-232 (RJ45-type)
LED Indicators: PWR1, PWR2, PoE, FAULT, STATE, LAN
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 electrically isolated inputs
• +13 to +30 V for state “1”
• +3 to -30 V for state “0”
• Max. input current: 8 mA

Physical Characteristics

Housing: Metal, IP30 protection
Weight: 1060 g (2.34 lb)
Dimensions: 52.85 x 135 x 105 mm (2.08 x 5.32 x 4.13 in)
Installation: DIN-rail mounting, wall mounting (optional)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC, redundant dual DC power inputs or 48 VDC Power-over-Ethernet (IEEE 802.3af compliant)
Input Current: 0.6 A @ 12 VDC; 0.15 A @ 48 VDC
Connector: 10-pin removable terminal block
Reverse Polarity Protection: Present

Standards and Certifications

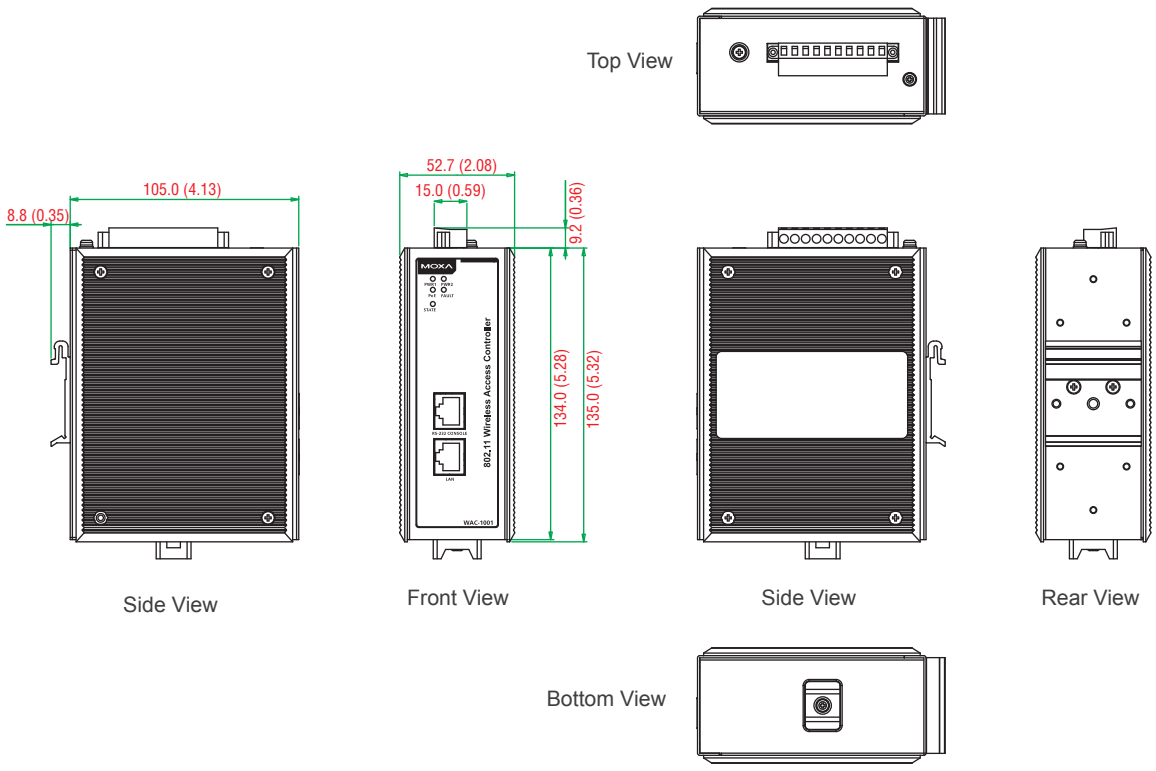
Safety: EN 60950-1(LVD), UL 60950-1, IEC 60950-1(CB)
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B, Class A
EMS:
IEC 61000-4-2 ESD: Contact 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
EN 61000-4-6 CS: 10 V
EN 61000-4-8
Note: Please check Moxa’s website for the most up-to-date certification status.

MTBF (mean time between failures)
Time: 477,425 hrs
Standard: Telcordia SR332

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models
WAC-1001: Industrial wireless access controller, 0 to 60°C operating temperature
WAC-1001-T: Industrial wireless access controller, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)
WK-51-01: DIN-rail/wall-mounting kit, 2 plates with 6 screws
DK-DC50131: Din-rail mounting kit, 50 x 131 mm

Package Checklist
- WAC-1001 wireless controller
- Cable holder with 1 screw
- 2 protective caps
- DIN-rail kit
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

WAC-2004 Series

Industrial wireless access controller

- 2-in-1 AP controller and mobile IP home agent
- Millisecond-level controller-based Turbo Roaming
- IEEE 802.11i-compliant wireless security
- Layer-3 mobile IP technology
- Up to 450 Mbps throughput for tunneling
- Scalable tunneling capacity

Introduction

The goal of zero-latency-roaming is to create networks that maintain seamless communications as clients switch from one access point to another. Moxa's advanced WAC-2004 wireless access controller uses controller-based Turbo Roaming technology to achieve millisecond-level roaming over different IP subnets. The combination of an advanced roaming algorithm and mobile IP technology allows wireless clients to roam between different IP subnets within milliseconds, while maintaining stringent security in extremely demanding environments. The WAC-2004 is rated to operate at temperatures ranging from 0 to 50°C, and is rugged enough for installation in any harsh industrial environment.

Maximum Availability

- Device-level redundancy via hot standby controller

Minimum Handover Time

- Millisecond-level Turbo Roaming
- Inter-controller roaming

Maximum Mobility in L3 Networks

- Mobile IP tunneling
- Care-of-Address (CoA) assignment
- Cross layer 3 subnet roaming

Specifications

WLAN Interface

Standards:
IEEE 802.11i for Wireless Security
IEEE 802.3 for 10Base5
IEEE 802.3u for 10/100BaseT(X)
IEEE 802.3ab for 1000BaseT
Security: WPA/WPA2-Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP, and AES)
Supported Models:
• AWK-RTG series
• Customized AWK series products
• TAP-6226

Interface

LAN Port: 10/100/1000BaseT(X), auto negotiation speed (RJ45-type)
• P1: communication port for WAC/HA
• P2-4: reserved
Console Port: RS-232 (DB9-type, male)
• Serial signals: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
LED Indicators: PWR1, PWR2, FAULT, STATE, 100M x 4, 1000M x 4

Wireless Access Control

AP Support: AWK-RTG series, TAP-6226, WAC-1001
WAC Failover: 1-on-1 hot backup
Roaming Support: single/multi-channel roaming (up to 3 channels), inter-controller roaming
Handover Time: millisecond-level with wireless security

Mobile IP Tunneling

Tunneling: home agent to mobile node
Tunneling Capacity: up to 450 Mbps
CoA Assignment: WAC-based management
HA failover: 1-to-1 hot backup

Management

Device Management: Web console, Telnet, and SSH access
Remote Management: External management utility and SNMP support
Network Monitoring: AP/Client connection status monitoring

Physical Characteristics

Housing: SECC sheet metal (1 mm)
Weight: 5480 g (12.08 lb)
Dimensions: 440 x 44 x 325 mm (17.32 x 1.73 x 12.80 in) (without rackmount ears)
Installation: Standard 19-inch rackmount

Environmental Limits

Operating Temperature: 0 to 50°C (32 to 122°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 100 to 240 VAC
Input Current: 1.2 A @ 100 VAC

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24, EN 61000-6-2/6-4, EN 61000-3-2/3-3
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

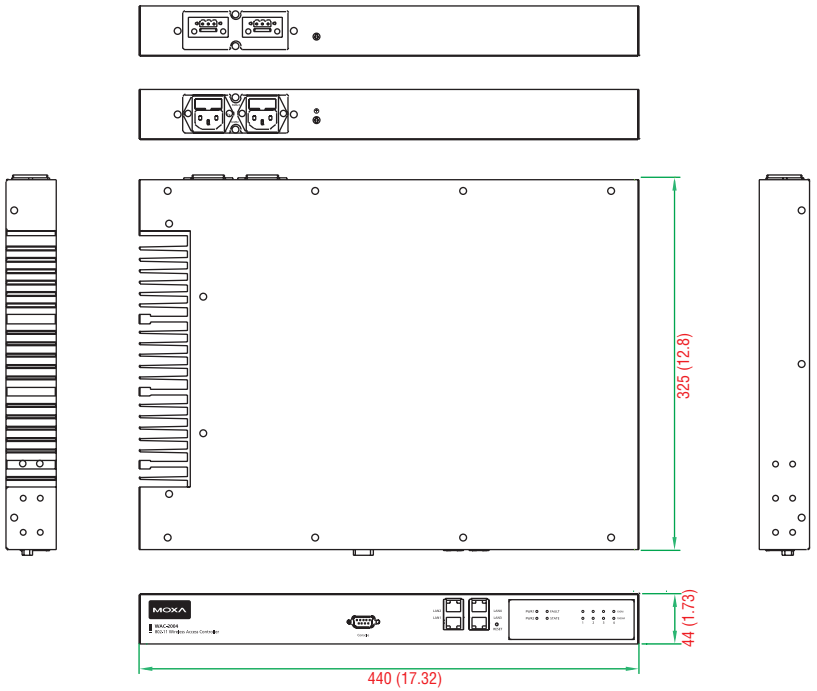
Time: 383,478 hrs
Standard: Telcordia SR332

Warranty

Warranty Period: 3 years
Details: www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

WAC-2004: Industrial wireless access controller, 0 to 50°C operating temperature

Package Checklist

- WAC-2004 wireless controller
- 1 AC power cord (C13-type, US or EU)
- 1 serial console cable (DB9-type, female-to-female)
- 4 RJ45 connector protective caps
- 2 rackmount ears
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

AWK-3131-RCC Series

Industrial IEEE 802.11a/b/g/n wireless AP/bridge/client

- Designed specifically for rail carriage-to-carriage communication
- IEEE 802.11a/b/g/n compliant
- Up to 300 Mbps data rate
- M12 anti-vibration connectors
- MIMO technology increases data throughput and range
- Complies with a portion of EN 50155 specifications
- -40 to 75°C operating temperature range (T models)

802.11

EN 50121

Introduction

The AWK-3131-RCC series industrial 802.11n wireless AP/bridge/client is an ideal wireless solution for applications such as onboard passenger infotainment systems and inter-carriage wireless backbone networks. The AWK-3131-RCC series provides a faster data rate than the 802.11g model and is ideal for a great variety of wireless configurations and applications. The auto carriage connection (ACC) feature provides simple deployment and increases the reliability of wireless carriage backbone networks. The AWK-3131-RCC series is also optimized for passenger Wi-Fi services and complies with a portion of EN 50155 specifications, covering operating temperature, power input voltage, surge, ESD, and vibration, making the products suitable for a variety of industrial applications. The AWK-3131-RCC series can also be powered via PoE for easier deployment.

Improved Higher Data Rate and Bandwidth

- High-speed wireless connectivity with up to 300 Mbps data rate
- MIMO technology to improve the capability of transmitting and receiving multiple data streams
- Increased channel width with channel bonding technology

Specifications for Industrial-Grade Applications

- Industrial-grade QoS and VLAN for efficient data traffic management
- Integrated DI/DO for on-site monitoring and warnings
- Signal strength LEDs for easy deployment and antenna alignment

Specifications

WLAN Interface

Standards:
IEEE 802.11a/b/g/n for Wireless LAN
IEEE 802.11i for Wireless Security
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3ab for 1000BaseT
IEEE 802.3af for Power-over-Ethernet
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN

Spread Spectrum and Modulation (typical):
- DSSS with DBPSK, DQPSK, CCK
- OFDM with BPSK, QPSK, 16QAM, 64QAM
- 802.11b: CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBPSK @ 1 Mbps
- 802.11a/g: 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps
- 802.11n: 64QAM @ 300 Mbps to BPSK @ 6.5 Mbps (multiple rates supported)

Operating Channels (central frequency):
US:
2.412 to 2.462 GHz (11 channels)
5.18 to 5.24 GHz (4 channels)
EU:
2.412 to 2.472 GHz (13 channels)
5.18 to 5.24 GHz (4 channels)
JP:
2.412 to 2.472 GHz (13 channels, OFDM)
2.412 to 2.484 GHz (14 channels, DSSS)
5.18 to 5.24 GHz (4 channels for W52)

Security:
- SSID broadcast enable/disable
- Firewall for MAC/IP/Protocol/Port-based filtering
- 64-bit and 128-bit WEP encryption, WPA/WPA2-Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP, and AES)

Transmission Rates:
802.11b: 1, 2, 5.5, 11 Mbps
802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11n: 6.5 to 300 Mbps (multiple rates supported)

TX Transmit Power:
802.11b:
1 to 11 Mbps: Typ. 18 dBm (± 1.5 dBm)
802.11g:
6 to 24 Mbps: Typ. 18 dBm (± 1.5 dBm)
36 to 48 Mbps: Typ. 17 dBm (± 1.5 dBm)
54 Mbps: Typ. 15 dBm (± 1.5 dBm)

802.11a:
6 to 24 Mbps: Typ. 17 dBm (± 1.5 dBm)
36 to 48 Mbps: Typ. 16 dBm (± 1.5 dBm)
54 Mbps: Typ. 14 dBm (± 1.5 dBm)
TX Transmit Power MIMO (per connector):
802.11a/n (20/40 MHz):
MCS15 20 MHz: Typ. 13 dBm (±1.5 dBm)
MCS15 40 MHz: Typ. 12 dBm (±1.5 dBm)
802.11g/n (20 MHz):
MCS15 20 MHz: Typ. 14 dBm (±1.5 dBm)
RX Sensitivity:
802.11b:
-92 dBm @ 1 Mbps, -90 dBm @ 2 Mbps, -88 dBm @ 5.5 Mbps, -84 dBm @ 11 Mbps
802.11g:
-87 dBm @ 6 Mbps, -86 dBm @ 9 Mbps, -85 dBm @ 12 Mbps, -82 dBm @ 18 Mbps, -80 dBm @ 24 Mbps, -76 dBm @ 36 Mbps, -72 dBm @ 48 Mbps, -70 dBm @ 54 Mbps
802.11a:
-87 dBm @ 6 Mbps, -86 dBm @ 9 Mbps, -85 dBm @ 12 Mbps, -82 dBm @ 18 Mbps,
-80 dBm @ 24 Mbps, -76 dBm @ 36 Mbps, -72 dBm @ 48 Mbps, -70 dBm @ 54 Mbps
RX Sensitivity MIMO:
802.11a/n:
-68 dBm @ MCS15 40 MHz,
-69 dBm @ MCS15 20 MHz,
-70 dBm @ MCS7 40 MHz,
-71 dBm @ MCS7 20 MHz
802.11g/n:
-69 dBm @ MCS15 20 MHz,
-71 dBm @ MCS7 20 MHz

Protocol Support

General Protocols: Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNTP, TCP, UDP, RADIUS, SNMP, PPPoE, DHCP
AP-only Protocols: ARP, BOOTP, DHCP, STP/RSTP (IEEE 802.1D/w)

Interface

Connector for External Antennas: QMA (female)
M12 Ports: 1, 10/100/1000BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X female connection
Console Port: RS-232 (RJ45-type)
Reset: Present
LED Indicators: PWR1, PWR2, PoE, FAULT, STATE, signal strength, WLAN, LAN
Alarm Contact (digital output): 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 electrically isolated inputs
• +13 to +30 V for state "1"
• +3 to -30 V for state "0"
• Max. input current: 8 mA

Physical Characteristics

Housing: Metal, IP30 protection
Weight: 970 g (2.14 lb)
Dimensions: 53 x 135 x 105 mm (2.08 x 5.31 x 4.13 in)
Installation: DIN-rail mounting (standard), wall mounting (optional)

Environmental Limits

Operating Temperature:
Standard Models: -25 to 60°C (-13 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5% to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC, redundant dual DC power inputs or 48 VDC Power-over-Ethernet (IEEE 802.3af compliant)
Input Current: 0.7 A @ 12 VDC
Connector: 10-pin removable terminal block
Reverse Polarity Protection: Present

Standards and Certifications

Safety: EN 60950-1(LVD), UL 60950-1, IEC 60950-1(CB)
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Radio:
EU: EN 300 328, EN 301 893
US: FCC ID SLE-WAPN001
JP: TELEC
Rail Traffic: EN 50155*, EN 50121-4, EN 45545-2
*Complies with a portion of EN 50155 specifications.
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time: 407,416 hrs
Standard: Telcordia SR332

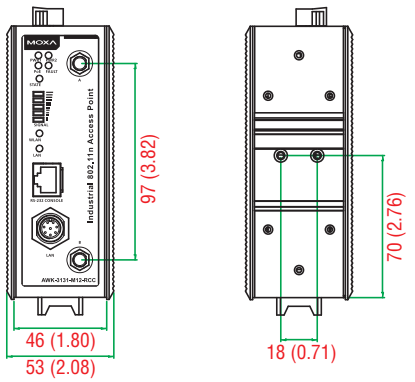
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

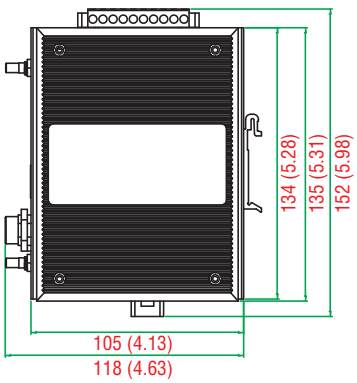
Dimensions

Unit: mm (inch)

AWK-3131-M12-RCC



Front and Rear Views



Side View

Ordering Information

Available Models				Port Interface	Antenna Interface	
Model Name	Standard Temperature (-25 to 60°C)	Wide Temperature (-40 to 75°C)	Conformal Coating	M12 10/100/1000BaseT(X)	RP-SMA	QMA
AWK-3131-M12-RCC						
AWK-3131-M12-RCC-US	✓	–	–	✓	–	✓
AWK-3131-M12-RCC-EU	✓	–	–	✓	–	✓
AWK-3131-M12-RCC-JP	✓	–	–	✓	–	✓
AWK-3131-M12-RCC-US-T	–	✓	–	✓	–	✓
AWK-3131-M12-RCC-EU-T	–	✓	–	✓	–	✓
AWK-3131-M12-RCC-JP-T	–	✓	–	✓	–	✓
AWK-3131-M12-RCC-US-CT	✓	–	✓	✓	–	✓
AWK-3131-M12-RCC-EU-CT	✓	–	✓	✓	–	✓
AWK-3131-M12-RCC-JP-CT	✓	–	✓	✓	–	✓
AWK-3131-M12-RCC-US-CT-T	–	✓	✓	✓	–	✓
AWK-3131-M12-RCC-EU-CT-T	–	✓	✓	✓	–	✓
AWK-3131-M12-RCC-JP-CT-T	–	✓	✓	✓	–	✓

Note:
US: USA band
EU: Europe band
JP: Japan band
CT: conformal coating

Optional Accessories (can be purchased separately)

WK-51-01: DIN-rail/wall-mounting kit, 2 plates with 6 screws
DK-DC50131: Din-rail mounting kit, 50 x 131 mm

Package Checklist

- AWK-3131-RCC wireless AP/bridge/client
- DIN-rail kit
- 2 plastic RJ45 protective caps for console ports
- Cable holder with 1 screw
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

AWK-5232-RCC Series

Industrial IEEE 802.11a/b/g/n dual-radio wireless AP/bridge/client

- Designed specifically for rail carriage-to-carriage communication
- IEEE 802.11a/b/g/n compliant
- Dual-radio design: 2.4 GHz and/or 5 GHz RF bands
- Redundant power inputs and PoE+
- Up to 300 Mbps data rate
- M12 anti-vibration connectors
- MIMO technology increases data throughput and range
- Complies with a portion of EN 50155 specifications
- -40 to 75°C operating temperature range (T models)

802.11 Dual RF

EN 50121 cULus LISTED CE FC

Introduction

The AWK-5232-RCC series industrial 802.11n wireless AP/bridge/client is an ideal wireless solution for applications such as onboard passenger infotainment systems and inter-carriage wireless backbone networks. It provides a faster data rate, wider range, and a noticeably stronger signal than the 802.11g model. With two independent RF modules, the AWK-5232-RCC series supports a great variety of wireless configurations and applications. The auto carriage connection (ACC) feature provides simple deployment and increases the reliability of wireless carriage backbone networks. The AWK-5232-RCC series is also optimized for passenger Wi-Fi services and complies with a portion of EN 50155 specifications covering operating temperature, power input voltage, surge, ESD, and vibration, making the switches suitable for a variety of industrial applications. The AWK-5232-RCC's two DC power inputs increase the reliability of the power supply, and it can also be powered via PoE+ for easier deployment.

Higher Data Rate and Greater Bandwidth

- High-speed wireless connectivity with up to 300 Mbps data rate
- MIMO technology improves data throughput via mulitplexed, smart antenna transmissions and receptions
- Channel bonding technology for increased throughput or channel redundancy

Redundancy to Increase System Reliability

- Dual DC power inputs and PoE+
- Immunity against disconnection caused by radio interference

Specifications for Rail Onboard Applications

- Auto Carriage Connection (ACC)
- Maximum WPA2/802.11i security
- Client isolation
- Multicast traffic rate control

Specifications

WLAN Interface

Standards:
IEEE 802.11a/b/g/n for Wireless LAN
IEEE 802.11i for Wireless Security
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3ab for 1000BaseT
IEEE 802.3at for Power-over-Ethernet Plus
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN
Spread Spectrum and Modulation (typical):
• DSSS with DBPSK, DQPSK, CCK
• OFDM with BPSK, QPSK, 16QAM, 64QAM
• 802.11b: CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBPSK @ 1 Mbps
• 802.11a/g: 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps
• 802.11n: 64QAM @ 300 Mbps to BPSK @ 6.5 Mbps (multiple rates supported)

Operating Channels (central frequency):
US:
2.412 to 2.462 GHz (11 channels)
5.18 to 5.24 GHz (4 channels)
EU:
2.412 to 2.472 GHz (13 channels)
5.18 to 5.24 GHz (4 channels)
JP:
2.412 to 2.472 GHz (13 channels, OFDM)
2.412 to 2.484 GHz (14 channels, DSSS)
5.18 to 5.24 GHz (4 channels for W52)
Security:
• SSID broadcast enable/disable
• Firewall for MAC/IP/Protocol/Port-based filtering
• 64-bit and 128-bit WEP encryption, WPA/WPA2-Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP, and AES)
Transmission Rates:
802.11b: 1, 2, 5.5, 11 Mbps
802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11n: 6.5 to 300 Mbps (multiple rates supported)

TX Transmit Power:
802.11b:
1 to 11 Mbps: Typ. 18 dBm (± 1.5 dBm)
802.11g:
6 to 24 Mbps: Typ. 18 dBm (± 1.5 dBm)
36 to 48 Mbps: Typ. 17 dBm (± 1.5 dBm)
54 Mbps: Typ. 15 dBm (± 1.5 dBm)
802.11a:
6 to 24 Mbps: Typ. 17 dBm (± 1.5 dBm)
36 to 48 Mbps: Typ. 16 dBm (± 1.5 dBm)
54 Mbps: Typ. 14 dBm (± 1.5 dBm)
TX Transmit Power MIMO (per connector):
802.11a/n (20/40 MHz):
MCS15 20 MHz: Typ. 13 dBm (±1.5 dBm)
MCS15 40 MHz: Typ. 12 dBm (±1.5 dBm)
802.11g/n (20 MHz):
MCS15 20 MHz: Typ. 14 dBm (±1.5 dBm)
RX Sensitivity:
802.11b:
-92 dBm @ 1 Mbps, -90 dBm @ 2 Mbps, -88 dBm @ 5.5 Mbps, -84 dBm @ 11 Mbps
802.11g:
-87 dBm @ 6 Mbps, -86 dBm @ 9 Mbps, -85 dBm @ 12 Mbps, -82 dBm @ 18 Mbps, -80 dBm @ 24 Mbps, -76 dBm @ 36 Mbps, -72 dBm @ 48 Mbps, -70 dBm @ 54 Mbps
802.11a:
-87 dBm @ 6 Mbps, -86 dBm @ 9 Mbps, -85 dBm @ 12 Mbps, -82 dBm @ 18 Mbps, -80 dBm @ 24 Mbps, -76 dBm @ 36 Mbps, -72 dBm @ 48 Mbps, -70 dBm @ 54 Mbps
RX Sensitivity MIMO:
802.11a/n:
-68 dBm @ MCS15 40 MHz,
-69 dBm @ MCS15 20 MHz,
-70 dBm @ MCS7 40 MHz,
-71 dBm @ MCS7 20 MHz
802.11g/n:
-69 dBm @ MCS15 20 MHz,
-71 dBm @ MCS7 20 MHz

Protocol Support

General Protocols: Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNTP, TCP, UDP, RADIUS, SNMP, PPPoE, DHCP
AP-only Protocols: ARP, BOOTP, DHCP, STP/RSTP (IEEE 802.1D/w)

Interface

Connector for External Antennas: QMA (female)
M12 Ports: 2, 10/100/1000BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X female connection
Console Port: RS-232 (RJ45-type)
Reset: Present
LED Indicators: PWR1, PWR2, PoE+, FAULT, STATE, WLAN1, WLAN2, LAN1, LAN2
Alarm Contact (digital output): 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 electrically isolated inputs
• +13 to +30 V for state “1”
• +3 to -30 V for state “0”
• Max. input current: 8 mA

Physical Characteristics

Housing: Metal, IP30 protection
Weight: 1200 g (2.65 lb)
Dimensions: 75 x 135 x 104 mm (2.94 x 5.31 x 4.10 in)
Installation: DIN-rail mounting (standard), wall mounting (optional)

Environmental Limits

Operating Temperature:
Standard Models: -25 to 60°C (-13 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5% to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC, redundant dual DC power inputs or 48 VDC Power-over-Ethernet (IEEE 802.3af compliant)
Input Current: 1.5 A @ 12 VDC
Connector: 10-pin removable terminal block
Reverse Polarity Protection: Present

Standards and Certifications

Safety: EN 60950-1(LVD), UL 60950-1, IEC 60950-1(CB)
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Radio:
EU: EN 300 328, EN 301 893
US: FCC ID SLE-WAPN001
JP: TELEC
Rail Traffic: EN 50155*, EN 50121-4, EN 45545-2
*Complies with a portion of EN 50155 specifications.
Note: Please check Moxa’s website for the most up-to-date certification status.

MTBF (mean time between failures)

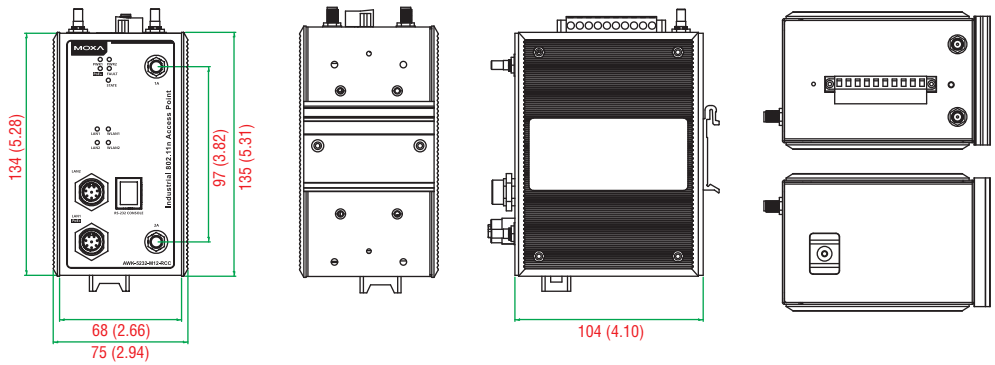
Time: 350,643 hrs
Standard: Telcordia SR332

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Front View | Rear View | Side View | Top & Bottom Views

Ordering Information

Available Models				Port Interface		Antenna Interface	
Model Name	Standard Temperature (-25 to 60°C)	Wide Temperature (-40 to 75°C)	Conformal Coating	2, 10/100/1000BaseT(X)		RP-SMA	QMA
				RJ45	M12		
AWK-5232-M12-RCC							
AWK-5232-M12-RCC-US-CT	✓	–	✓	–	✓	–	✓
AWK-5232-M12-RCC-EU-CT	✓	–	✓	–	✓	–	✓
AWK-5232-M12-RCC-US-CT-T	–	✓	✓	–	✓	–	✓
AWK-5232-M12-RCC-EU-CT-T	–	✓	✓	–	✓	–	✓
AWK-5232-M12-RCC-US	✓	–	–	–	✓	–	✓
AWK-5232-M12-RCC-EU	✓	–	–	–	✓	–	✓
AWK-5232-M12-RCC-US-T	–	✓	–	–	✓	–	✓
AWK-5222-M12-RCC-EU-T	–	✓	–	–	✓	–	✓

Note:
US: USA band
EU: Europe band
CT: conformal coating

Optional Accessories (can be purchased separately)

WK-51-01: DIN-rail/wall-mounting kit, 2 plates with 6 screws
DK-DC50131: Din-rail mounting kit, 50 x 131 mm

Package Checklist

- AWK-5232-RCC wireless AP/bridge/client
- DIN-rail kit
- 2 plastic RJ45 protective caps for console ports
- 1 plastic M12-female protective cap
- Cable holder with 1 screw
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Terminal Servers

Product Selection Guide

NPort® 6000 Terminal Servers 9-2
CN2600 Terminal Servers 9-4

Secure Terminal Servers

Secure Terminal Servers 9-6
NPort® 6150 Series: 1-port RS-232/422/485 secure terminal servers 9-8
NPort® 6250 Series: 2-port RS-232/422/485 secure terminal servers 9-10
NPort® 6450 Series: 4-port RS-232/422/485 secure terminal servers 9-13
NPort® 6600 Series: 8/16/32-port RS-232/422/485 rackmount terminal servers 9-16
CN2600 Series: 8/16-port RS-232/422/485 terminal servers with dual-LAN redundancy 9-20

Power Accessories

Power Accessory Selection Guide 9-24

NPort® 6000 Terminal Servers

	NPort 6150 NPort 6150-T	NPort 6250 NPort 6250-T	NPort 6250-M-SC NPort 6250-M-SC-T	NPort 6250-S-SC NPort 6250-S-SC-T	NPort 6450 NPort 6450-T	NPort 6610-8	NPort 6610-16
LAN Interface							
10/100BaseT(X) Ports	1 port (8-pin RJ45 connector)						
Magnetic Isolation Protection	1.5 kV						
100BaseFX Ports	–	–	1 (multi-mode)	1 (single-mode)	–	–	–
Expansion Modules							
10/100BaseT(X) (RJ45)	–	–	–	–	1 or 2 ports	1 or 2 ports	1 or 2 ports
Multi-mode Fiber (SC)	–	–	–	–	1 or 2 ports	1 or 2 ports	1 or 2 ports
Single-mode Fiber (SC)	–	–	–	–	1 or 2 ports	1 or 2 ports	1 or 2 ports
Serial Interface							
RS-232 Ports	–	–	–	–	–	8	16
RS-232/422/485 Ports	1	2	2	2	4	–	–
Connector	DB9 male	DB9 male	DB9 male	DB9 male	DB9 male	8-pin RJ45	8-pin RJ45
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark						
Flow Control	RTS/CTS, DTR/DSR, XON/XOFF						
Baudrate	50 bps to 921.6 kbps (supports nonstandard baudrates)						
RS-485 Data Direction Control	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®
RS-232 Console Port	✓	✓	✓	✓	✓	✓	✓
Advanced Features							
Serial Data Log	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB
Offline Port Buffering	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB
SD Slot	–	✓	✓	✓	✓	✓	✓
Software							
Network Protocols	ICMP, IPv4/v6, TCP, UDP, ARP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c/V3, DDNS, HTTP, SMTP, HTTPS, SSL, SSH, PPPoE, RFC2217, Turbo Ring, Turbo Ring 2						
Security Protocols	DES, 3DES, AES, SSH, SSL						
Configuration Options	Web Console, Telnet Console, Serial Console, Windows Utility						
Windows Real COM Drivers	Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded						
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X						
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x, 3.x						
Management	SNMP MIB-II						
IP Routing	Static, RIP-I, RIP-II						
Standard Operation Modes	Real COM, TCP Server, TCP Client, UDP, Pair Connection, RFC2217, Terminal, Reverse Telnet, Ethernet Modem, Printer, PPP, Disabled						
Secure Operation Modes	Secure Real COM, Secure TCP Server, Secure TCP Client, Secure Pair Connection, SSH, Reverse SSH						
Terminal Sessions	8 sessions per port						
Physical Characteristics							
Housing	Metal						
Weight	700 g (1.54 lb)	730 g (1.61 lb)	730 g (1.61 lb)	730 g (1.61 lb)	1,020 g (2.25 lb)	3,460 g (7.63 lb)	3,580 g (7.89 lb)
Dimensions	67 x 100.4 x 29 mm (2.64 x 3.95 x 1.1 in)	77 x 111 x 29 mm (3.30 x 4.37 x 1.1 in)	77 x 111 x 29 mm (3.30 x 4.37 x 1.1 in)	77 x 111 x 29 mm (3.30 x 4.37 x 1.1 in)	158 x 103 x 35 mm (6.22 x 4.06 x 1.38 in)	440 x 195 x 44 mm (17.32 x 7.68 x 1.73 in)	440 x 195 x 44 mm (17.32 x 7.68 x 1.73 in)
Environmental Limits							
Operating Temperature – Standard Temperature	0 to 55°C (32 to 131°F)						
Operating Temperature – Wide Temperature	-40 to 75°C (-40 to 167°F)					–	–
Storage Temperature	-40 to 75°C (-40 to 167°F)						
Ambient Relative Humidity	5 to 95% (non-condensing)						
Power Requirements							
Input Voltage	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	100 to 240 VAC	100 to 240 VAC
Input Current	285 mA @ 12 VDC	430 mA @ 12 VDC			730 mA @ 12 VDC	285 mA @ 100 VAC, 47 to 63 Hz	
Standards and Certifications							
Safety	UL 60950-1						
EMC	EN 55022/24						
EMI	CISPR 22, FCC Part 15B Class A						
EMS	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 1 kV; Signal: 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11 Dips					IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11 Dips	
Transportation	NEMA TS2		–	–	NEMA TS2		
Reliability							
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓
MTBF	Time: 2,097,705 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 1,947,486 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 1,092,794 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 1,477,682 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 850,905 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 135,891 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 102,373 hrs Standard: Telcordia (Bellcore) Standard TR/SR
Warranty	5 years (see www.moxa.com/warranty)						
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NPort® 6000 Terminal Servers

	NPort 6610-32	NPort 6610-8-48V NPort 6610-16-48V NPort 6610-32-48V	NPort 6650-8 NPort 6650-8-T	NPort 6650-16 NPort 6650-16-T	NPort 6650-32	NPort 6650-8-48V NPort 6650-16-48V NPort 6650-32-48V	NPort 6650-8-HV-T NPort 6650-16-HV-T NPort 6650-32-HV-T
LAN Interface							
10/100BaseT(X) Ports	1 port (8-pin RJ45 connector)						
Magnetic Isolation Protection	1.5 kV						
Expansion Modules							
10/100BaseT(X) (RJ45)	1 or 2 ports	1 or 2 ports	1 or 2 ports	1 or 2 ports	1 or 2 ports	1 or 2 ports	1 or 2 ports
Multi-mode Fiber (SC)	1 or 2 ports	1 or 2 ports	1 or 2 ports	1 or 2 ports	1 or 2 ports	1 or 2 ports	1 or 2 ports
Single-mode Fiber (SC)	1 or 2 ports	1 or 2 ports	1 or 2 ports	1 or 2 ports	1 or 2 ports	1 or 2 ports	1 or 2 ports
Serial Interface							
RS-232 Ports	32	8/16/32	–	–	–	–	–
RS-232/422/485 Ports	–		8	16	32	8/16/32	8/16/32
Connector	8-pin RJ45						
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark						
Flow Control	RTS/CTS, DTR/DSR, XON/XOFF						
Baudrate	50 bps to 921.6 kbps (supports nonstandard baudrates)						
RS-485 Data Direction Control	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®
RS-232 Console Port	✓	✓	✓	✓	✓	✓	✓
Advanced Features							
Serial Data Log	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB
Offline Port Buffering	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB
SD Slot	✓	✓	✓	✓	✓	✓	✓
Software							
Network Protocols	ICMP, IPv4/v6, TCP, UDP, ARP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c/V3, DDNS, HTTP, SMTP, HTTPS, SSL, SSH, PPPoE, RFC2217, Turbo Ring, Turbo Ring 2						
Security Protocols	DES, 3DES, AES, SSH, SSL						
Configuration Options	Web Console, Telnet Console, Serial Console, Windows Utility						
Windows Real COM Drivers	Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded						
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X						
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x, 3.x						
Management	SNMP MIB-II						
IP Routing	Static, RIP-I, RIP-II						
Standard Operation Modes	Real COM, TCP Server, TCP Client, UDP, Pair Connection, RFC2217, Terminal, Reverse Telnet, Ethernet Modem, Printer, PPP, Disabled						
Secure Operation Modes	Secure Real COM, Secure TCP Server, Secure TCP Client, Secure Pair Connection, SSH, Reverse SSH						
Terminal Sessions	8 sessions per port						
Physical Characteristics							
Housing	Metal						
Weight	3,600 g (7.94 lb)	3,460 g (7.63 lb) / 3,580 g (7.89 lb) / 3,600 g(7.94 lb)	3,460 g (7.63 lb)	3,580 g (7.89 lb)	3,600 g (7.94 lb)	3,460 g (7.63 lb) / 3,580 g (7.89 lb) / 3,600 g (7.94 lb)	3,460 g (7.63 lb) / 3,580 g (7.89 lb) / 3,600 g (7.94 lb)
Dimensions	440 x 195 x 44 mm (17.32 x 7.68 x 1.73 in)	440 x 195 x 44 mm (17.32 x 7.68 x 1.73 in)	440 x 195 x 44 mm (17.32 x 7.68 x 1.73 in)	440 x 195 x 44 mm (17.32 x 7.68 x 1.73 in)	440 x 195 x 44 mm (17.32 x 7.68 x 1.73 in)	440 x 195 x 44 mm (17.32 x 7.68 x 1.73 in)	440 x 195 x 44 mm (17.32 x 7.68 x 1.73 in)
Environmental Limits							
Operating Temperature – Standard Temperature	0 to 55°C (32 to 131°F)						–
Operating Temperature – Wide Temperature	–	–	-40 to 75°C (-40 to 167°F)	-40 to 75°C (-40 to 167°F)	–	–	-40 to 85°C (-40 to 185°F)
Storage Temperature	-40 to 75°C (-40 to 167°F)						-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)						
Power Requirements							
Input Voltage	100 to 240 VAC	±48 VDC	100 to 240 VAC	100 to 240 VAC	100 to 240 VAC	±48 VDC	88 to 300 VDC
Input Current	285 mA @ 100 VAC, 47 to 63 Hz	293 mA @ 48 VDC	285 mA @ 100 VAC, 47 to 63 Hz			293 mA @ 48 VDC	200 mA @ 88 VDC
Standards and Certifications							
Safety	UL 60950-1						
EMC	EN 55022/24						
EMI	CISPR 22, FCC Part 15B Class A						
EMS	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11 Dips	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m IEC 61000-4-8 PFMF	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11 Dips			IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m IEC 61000-4-8 PFMF	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m IEC 61000-4-8 PFMF
Transportation	NEMA TS2						
Reliability							
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓
MTBF	Time: 68,707 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 135,891 hrs/102,373 hrs/ 68,707 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 636,600 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 439,673 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 310,078 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 636,600 hrs/ 439,673 hrs/ 310,078 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 501,171 hrs/ 380,006 hrs/ 290,914 hrs Standard: Telcordia (Bellcore) Standard TR/SR
Warranty	5 years (see www.moxa.com/warranty)						
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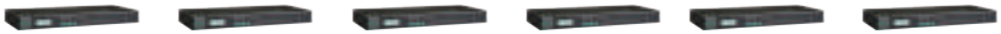
CN2600 Terminal Servers



	CN2610-8-2AC	CN2610-16-2AC	CN2650-8	CN2650-16	CN2650-8-2AC CN2650-8-2AC-T	CN2650-16-2AC CN2650-16-2AC-T
LAN Interface						
10/100BaseT(X) Ports	2 ports (2 MAC, 8-pin RJ45 connectors)					
Magnetic Isolation Protection	1.5 kV					
Serial Interface						
RS-232 Ports	8	16	–	–	–	–
RS-232/422/485 Ports	–	–	8	16	8	16
Connector	8-pin RJ45					
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark					
Flow Control	RTS/CTS, DTR/DSR, XON/XOFF					
Baudrate	50 bps to 921.6 kbps					
2 kV Isolation Protection	–	–	–	–	–	–
RS-485 Data Direction Control	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®
RS-232 Console Port	✓	✓	✓	✓	✓	✓
Advanced Features						
Serial Data Log	128K					
Offline Port Buffering	128K					
Software						
Network Protocols	ICMP, IPv4, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c/V3, HTTP, SMTP, ARP, PPPoE, DDNS					
Security Protocols	RADIUS, HTTPS, SSH, PAP, CHAP					
Configuration Options	Web Console, Telnet Console, Serial Console, Windows Utility					
Windows Real COM Drivers	Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded					
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X					
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x, 3.x					
Management	SNMP MIB-II					
IP Routing	Static, RIP-I, RIP-II					
Standard Operation Modes	Real COM, TCP Server, TCP Client, UDP, RFC2217, Terminal, Reverse Telnet, PPP, DRDAS, Redundant COM, Disabled					
Terminal Sessions	8 sessions per port					
Physical Characteristics						
Housing	Metal					
Weight	3,760 g (8.29 lb)	3,980 g (8.77 lb)	3,740 g (8.25 lb)	3,790 g (8.36 lb)	3,900 g (8.60 lb)	3,980 g (8.77 lb)
Dimensions	440 x 198 x 45.5 mm (17.32 x 7.80 x 1.77 in)					
Environmental Limits						
Operating Temperature – Standard Temperature	0 to 55°C (32 to 131°F)					
Operating Temperature – Wide Temperature	–	–	–	–	-40 to 75°C (-40 to 167°F)	-40 to 75°C (-40 to 167°F)
Storage Temperature	-40 to 75°C (-40 to 167°F)					
Ambient Relative Humidity	5 to 95% (non-condensing)					
Power Requirements						
Dual-Power Inputs for Redundancy	✓	✓	–	–	✓	✓
Input Voltage	100 to 240 VAC, 47 to 63 Hz					
Input Current	280 mA @ 100 VAC, 47 to 63 Hz					
Standards and Certifications						
Safety	UL 60950-1					
EMC	EN 55022/24					
EMI	CISPR 22, FCC Part 15B Class A					
EMS	IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2.5 kV; Signal: 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11 Dips					
Reliability						
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓
MTBF	Time: 124,859 hrs Standard: MIL-HDBK-217F	Time: 105,915 hrs Standard: MIL-HDBK-217F	Time: 457,140 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 375,472 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 457,140 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 375,472 hrs Standard: Telcordia (Bellcore) Standard TR/SR
Warranty	5 years (see www.moxa.com/warranty)					
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CN2600 Terminal Servers

		CN2650I-8	CN2650I-16	CN2650I-8-2AC	CN2650I-16-2AC	CN2650I-8-HV-T	CN2650I-16-HV-T
LAN Interface							
10/100BaseT(X) Ports		2 ports (2 MAC, 8-pin RJ45 connectors)					
Magnetic Isolation Protection		1.5 kV					
Serial Interface							
RS-232 Ports		–					
RS-232/422/485 Ports		8	16	8	16	8	16
Connector		DB9 male	DB9 male	DB9 male	DB9 male	DB9 male	DB9 male
Communication Parameters		Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark					
Flow Control		RTS/CTS, DTR/DSR, XON/XOFF					
Baudrate		50 bps to 921.6 kbps					
2 kV Isolation Protection		✓	✓	✓	✓	✓	✓
RS-485 Data Direction Control		ADDC®	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®
RS-232 Console Port		✓	✓	✓	✓	✓	✓
Advanced Features							
Serial Data Log		128 KB					
Offline Port Buffering		128 KB					
Software							
Network Protocols		ICMP, IPv4, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c/V3, HTTP, SMTP, ARP, PPPoE, DDNS					
Security Protocols		RADIUS, HTTPS, SSH, PAP, CHAP					
Configuration Options		Web Console, Telnet Console, Serial Console, Windows Utility					
Windows Real COM Drivers		Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded					
Fixed TTY Drivers		SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X					
Linux Real TTY Drivers		Linux 2.4.x, 2.6.x, 3.x					
Management		SNMP MIB-II					
IP Routing		Static, RIP-I, RIP-II					
Standard Operation Modes		Real COM, TCP Server, TCP Client, UDP, RFC2217, Terminal, Reverse Telnet, PPP, DRDAS, Redundant COM, Disabled					
Terminal Sessions		8 sessions per port					
Physical Characteristics							
Housing		Metal					
Weight		3,666 g (8.08 lb)	3,776 g (8.32 lb)	3,932 g (8.67 lb)	4,022 g (8.87 lb)	3,910 g (8.62 lb)	3,930 g (8.66 lb)
Dimensions		440 x 198 x 45.5 mm (17.32 x 7.80 x 1.77 in)					
Environmental Limits							
Operating Temperature	Standard Temperature	0 to 55°C (32 to 131°F)				–	–
	Wide Temperature	–	–	–	–	-40 to 85°C (-40 to 185°F)	-40 to 85°C (-40 to 185°F)
Storage Temperature		-40 to 75°C (-40 to 167°F)				-40 to 85°C (-40 to 185°F)	
Ambient Relative Humidity		5 to 95% (non-condensing)					
Power Requirements							
Dual-Power Inputs for Redundancy		–	–	✓	✓	–	–
Input Voltage		100 to 240 VAC, 47 to 63 Hz				88 to 300 VDC	
Input Current		325 mA @ 100VAC, 47 to 63 Hz				200 mA @ 88 VDC	
Standards and Certifications							
Safety		UL 60950-1					
EMC		EN 55022/24					
EMI		CISPR 22, FCC Part 15B Class A					
EMS		IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2.5 kV; Signal: 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11 Dips				IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m IEC 61000-4-8 PFMF	
Reliability							
Buzzer, RTC, WDT		✓	✓	✓	✓	✓	✓
MTBF		Time: 190,562 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 115,887 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 190,562 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 115,887 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 191,326 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 116,924 hrs Standard: Telcordia (Bellcore) Standard TR/SR
Warranty		5 years (see www.moxa.com/warranty)					
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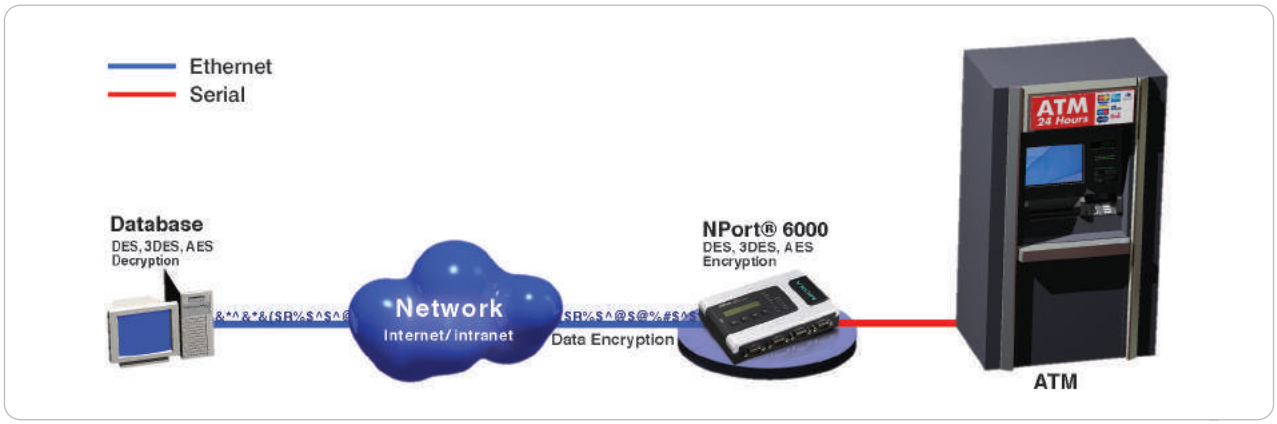
Secure Terminal Servers

NPort® 6000 secure terminal servers provide serial-to-Ethernet connectivity that is both reliable and secure. They can be used to connect any serial device to an Ethernet network using a variety of operation modes—Real COM, TCP Server, TCP Client, UDP, RFC2217, Pair Connection, Ethernet Modem, Terminal, Reverse Terminal, Printer, and Dial in/out. For applications that require data security, such as banking, telecom, access control, and remote site management, secure modes are also available—Secure TCP Server, Secure TCP Client, Secure Pair-Connection, Secure Real COM, and Secure Terminal modes.

Safe Data Communication

Secure Data Communication with SSL

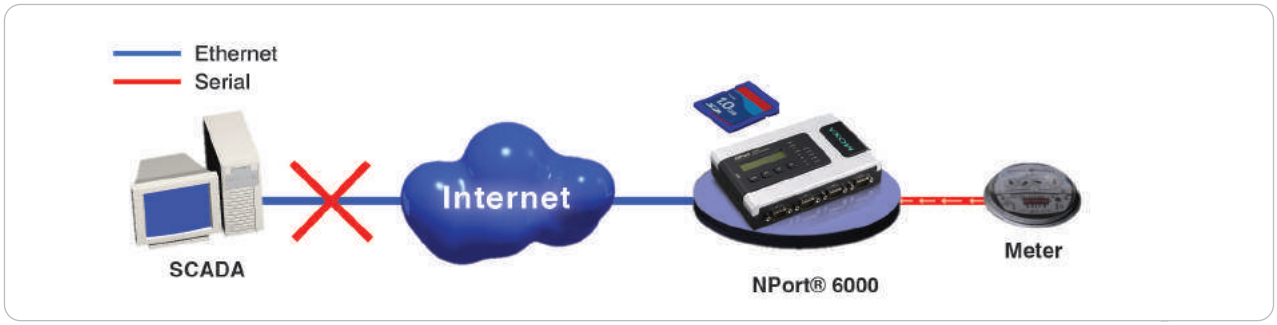
Network security is a critical issue for certain applications. It is especially important when data is transmitted over the Internet where it is vulnerable to interception by third parties. The NPort® 6000 secure terminal servers use SSL to implement secure data transmission for Secure TCP Server, Secure TCP Client, Secure Pair Connection, and Secure Real COM modes. The NPort®'s drivers follow the SSL standard and automatically negotiate the encryption key. To prevent hacker attacks, the NPort® will automatically switch from DES/3DES to AES encryption.



Reliable Data Communication

Port Buffering that Preserves Data if the Ethernet Connection Fails

For mission-critical applications, data collected from a serial connection device must be safeguarded in case the Ethernet network gets disconnected. The NPort® 6000 provides exceptionally reliable data transmission by saving serial data to an internal 64 KB port buffer if the Ethernet connection fails. When the Ethernet network is reconnected, data in the buffer is automatically released and sent to the appropriate destination. For the NPort® 6250, 6450, and 6650, this buffer can be expanded by installing an SD card.



Ethernet Port Expansion (NPort® 6450/6600 only)

Although more and more devices are now Ethernet-ready, many legacy devices only provide a serial interface. The main purpose of a device server is to connect serial devices to an Ethernet network, allowing engineers to integrate all of their devices into an Ethernet environment. A problem can arise if both Ethernet-ready and legacy serial devices need to be connected at the same location. The NPort® 6000 can use the Ethernet expansion module to add additional Ethernet ports, effectively allowing operation as a combination Ethernet switch and device server. By using the NPort® 6000's Ethernet expansion modules, users no longer need to invest in a more expensive switch or hub to connect every device. Modules are available for different Ethernet media, including copper Ethernet, multimode fiber, and single-mode fiber. Ethernet expansion modules can also be used to create a cascading topology, in which device servers are connected to each other in a daisy chain arrangement.

Interchangeable modules for Ethernet expansion

1 fiber Ethernet port (single- or multi-mode)

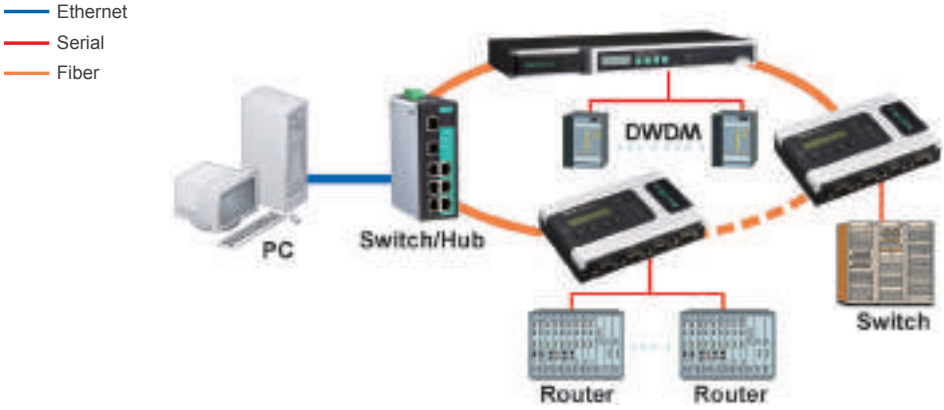
2 fiber Ethernet ports (single- or multi-mode)

1 RJ45 Ethernet port

2 RJ45 Ethernet ports

Ethernet Ring Topology with Fast Recovery (NPort® 6450/6600 only)

NPort® 6000 secure terminal servers support the Turbo Ring protocol for cascade topologies. With Turbo Ring™, if any segment of the daisy-chain ring is disconnected, the network will recover in less than 300 ms.



NPort® 6150 Series

1-port RS-232/422/485 secure terminal servers

- Secure operation modes for Real COM, TCP Server, TCP Client, Pair Connection, Terminal, and Reverse Terminal
- Nonstandard baudrates supported with high precision
- Automatic RS-485 data direction control with Moxa's patented ADDC®
- Enhanced remote configuration with HTTPS and SSH
- Port buffers for storing serial data when the Ethernet is offline
- Supports IPv6
- Generic serial commands supported in Command-by-Command mode

Overview

The NPort® 6150 1-port device servers use the SSL and SSH protocols to transmit encrypted serial data over Ethernet. The NPort® 6150's 3-in-1 serial port supports RS-232, RS-422, and RS-485, with the interface selected from an easy-to-access configuration menu.

Secure Data Transmission

For many applications, guaranteeing secure data transmission is an important concern when connecting serial devices to a network. To answer this concern, the NPort® 6150 supports the SSL and SSH protocols, which work by encrypting data before sending it over the network. With the NPort® 6150, users can rest assured that serial data is transmitted securely over both private and public networks.

Specifications

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation: 1.5 kV built-in

Serial Interface

Number of Ports: 1
Serial Standards: RS-232/422/485
Connector: DB9 male
RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)
Console Port: Serial port doubles as RS-232 console port

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, DTR/DSR, XON/XOFF
Baudrate: 50 bps to 921.6 kbps (supports nonstandard baudrates)
Pull High/Low Resistor for RS-485: 1 kΩ, 150 kΩ

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IPv4/v6, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c/V3, HTTP, SMTP, ARP, PPPoE
Security Protocols: DES, 3DES, AES, SSH, SSL
Configuration Options: Web Console, Serial Console, Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X
Linux Real TTY Drivers: Linux 2.4.x, 2.6.x, 3.x
Management: SNMP MIB-II
IP Routing: Static, RIP-I, RIP-II

Operation Modes

Standard: Real COM, TCP Server, TCP Client, UDP, Pair Connection, RFC2217, Terminal, Reverse Telnet, Ethernet Modem, Printer, PPP, Disabled
Secure: Secure Real COM, Secure TCP Server, Secure TCP Client, Secure Pair Connection, SSH, Reverse SSH

Applications

Terminal Sessions: 8 sessions per port

Physical Characteristics

Housing: Metal
Weight: 700 g (1.54 lb)
Dimensions:
Without ears: 67 x 100.4 x 29 mm (2.64 x 3.95 x 1.1 in)
With ears: 90 x 100.4 x 29 mm (3.54 x 3.95 x 1.1 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current: 285 mA @ 12 VDC
Power Line Protection: 1 kV burst (EN 61000-4-4: EFT/B), 1 kV surge (EN 61000-4-5)

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 1 kV; Signal: 1 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11 DIPs

Freefall: IEC-68-2-6, IEC-68-2-34, IEC-68-2-32
Vibration: IEC-68-2-6, IEC-68-2-34
Green Product: RoHS, CRoHS, WEEE
Transportation: NEMA TS2

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)

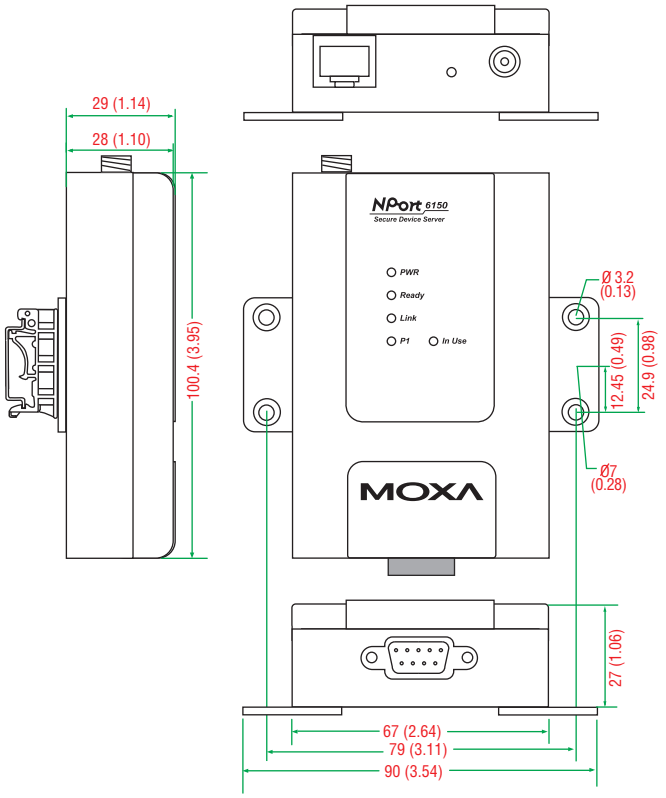
Time: 2,097,705 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions and Pin Assignment

Unit: mm (inch)

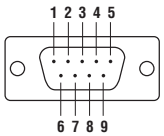


DK35A DIN-Rail Kit

Available Accessory

DB9 male connector

Pin Assignment



PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

Ordering Information

Available Models

NPort 6150: 1-port RS-232/422/485 secure device server, 0 to 55°C operating temperature
NPort 6150-T: 1-port RS-232/422/485 secure device server, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DK35A: DIN-rail mounting kit, 35 mm, 2 DIN-rail plates with 4 screws
CBL-PJ21NOPEN-BK-30: Locking barrel plug to bare-wires cable
Mini DB9F-to-TB: DB9(F) to terminal block connector
Note: One power adapter suitable for your region is included in the product package. Additional power adapters can be purchased separately. Please refer to the Power Accessory Selection Guide for details.

Package Checklist

- 1 NPort 6150 secure device server
- 100 to 240 VAC power adapter (excluding T models)*
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

*For non-T models, the package includes one power adapter suitable for your region.

NPort® 6250 Series

2-port RS-232/422/485 secure terminal servers

- Secure operation modes for Real COM, TCP Server, TCP Client, Pair Connection, Terminal, and Reverse Terminal
- Nonstandard baudrates supported with high precision
- Choice of network medium: 10/100BaseT(X) or 100BaseFX
- Enhanced remote configuration with HTTPS and SSH
- Port buffers for storing serial data when the Ethernet is offline
- Supports IPv6
- Generic serial commands supported in Command-by-Command mode

Overview

The 2-port NPort® 6250 device servers use the SSL and SSH protocols to transmit encrypted serial data over Ethernet. Models are available for connecting to a 10/100BaseT(X) copper Ethernet or 100BaseT(X) fiber network. Both single-mode and multi-mode fiber are supported.

Zero Data Loss if Ethernet Connection Fails

The NPort® 6250 device servers help guarantee reliability by providing users with secure serial-to-Ethernet data transmission and a customer-oriented hardware design. If the Ethernet connection fails, the NPort® 6250 will queue all serial data in its internal 64 KB port buffer. When the Ethernet connection is re-established, the NPort® 6250 will immediately release all of the data in the buffer in the order that it was received. Users can increase the port buffer size by installing an SD card.

Specifications

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation: 1.5 kV built-in

Optical Fiber Interface (NPort 6250-S-SC/6250-M-SC)

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm	G.652
			800 MHz*km	
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Serial Interface

Number of Ports: 2
Serial Standards: RS-232/422/485
Connector: DB9 male
RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)
Console Port: Serial port 1 doubles as RS-232 console port

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, DTR/DSR, XON/XOFF
Baudrate: 50 bps to 921.6 kbps (supports nonstandard baudrates)
Pull High/Low Resistor for RS-485: 1 kΩ, 150 kΩ

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Memory Expansion Slot

Slot Type: SD slot (supports up to 2 GB)

Software

Network Protocols: ICMP, IPv4/v6, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c/V3, HTTP, SMTP, ARP, PPPoE
Security Protocols: DES, 3DES, AES, SSH, SSL
Configuration Options: Web Console, Serial Console, Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X
Linux Real TTY Drivers: Linux 2.4.x, 2.6.x, 3.x
Management: SNMP MIB-II
IP Routing: Static, RIP-I, RIP-II

Operation Modes

Standard: Real COM, TCP Server, TCP Client, UDP, Pair Connection, RFC2217, Terminal, Reverse Telnet, Ethernet Modem, Printer, PPP, Disabled
Secure: Secure Real COM, Secure TCP Server, Secure TCP Client, Secure Pair Connection, SSH, Reverse SSH

Applications

Terminal Sessions: 8 sessions per port

Physical Characteristics

Housing: Metal
Weight: 730 g (1.61 lb)
Dimensions:
Without ears: 77 x 111 x 29 mm (3.30 x 4.37 x 1.1 in)
With ears: 89 x 111 x 29 mm (3.50 x 4.37 x 1.1 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current:
NPort 6250: 333 mA @ 12 VDC
NPort 6250-M-SC: 428 mA @ 12 VDC
NPort 6250-S-SC: 376 mA @ 12 VDC
Power Line Protection: 1 kV burst (EN 61000-4-4: EFT/B), 1 kV surge (EN 61000-4-5)

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 1 kV; Signal: 1 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11 DIPs
Freefall: IEC-68-2-6, IEC-68-2-34, IEC-68-2-32
Vibration: IEC-68-2-6, IEC-68-2-34
Green Product: RoHS, CRoHS, WEEE
Transportation: NEMA TS2 (excluding fiber models)

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)

Time:
NPort 6250: 1,947,486 hrs
NPort 6250 Multi-mode fiber: 1,092,794 hrs
NPort 6250 Single-mode fiber: 1,477,682 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

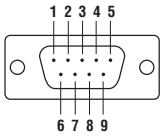
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Pin Assignment

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

DB9 male connector

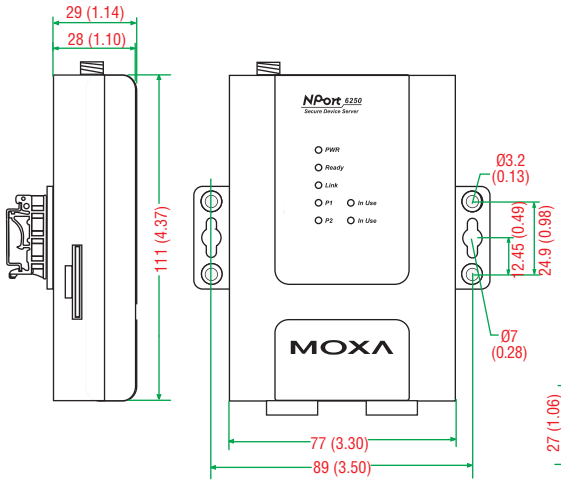


Dimensions

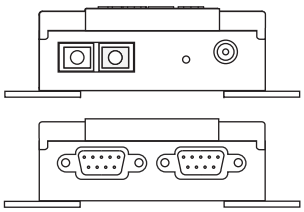
Unit: mm (inch)

DK35A DIN-Rail Kit

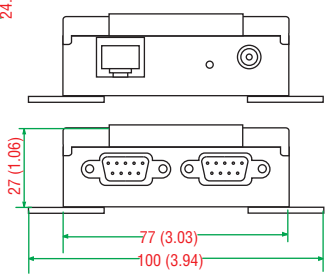
Available Accessory



NPort® 6250-M-SC/6250-S-SC



NPort® 6250



Ordering Information

Available Models

NPort 6250: 2-port secure device server, RS-232/422/485 to Ethernet
NPort 6250-M-SC: 2-port secure device server, RS-232/422/485 to multi-mode fiber (SC connector)
NPort 6250-S-SC: 2-port secure device server, RS-232/422/485 to single-mode fiber (SC connector)
NPort 6250-T: 2-port secure device server, RS-232/422/485 to Ethernet, -40 to 75°C operating temperature
NPort 6250-M-SC-T: 2-port secure device server, RS-232/422/485 to multi-mode fiber (SC connector), -40 to 75°C operating temperature
NPort 6250-S-SC-T: 2-port secure device server, RS-232/422/485 to single-mode fiber (SC connector), -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DK35A: DIN-rail mounting kit, 35 mm, 2 DIN-rail plates with 4 screws
CBL-PJ21NOPEN-BK-30: Locking barrel plug to bare-wires cable
Mini DB9F-to-TB: DB9(F) to terminal block connector
Note: One power adapter suitable for your region is included in the product package. Additional power adapters can be purchased separately. Please refer to the Power Accessory Selection Guide for details.

Package Checklist

- 1 NPort 6250 secure device server
- 100 to 240 VAC power adapter (excluding T models)*
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

*For non-T models, the package includes one power adapter suitable for your region.

NPort® 6450 Series

4-port RS-232/422/485 secure terminal servers

NPort 6450-T

NPort 6450

- **LCD panel for easy IP address configuration (standard temp. models)**
- **Secure operation modes for Real COM, TCP Server, TCP Client, Pair Connection, Terminal, and Reverse Terminal**
- **Nonstandard baudrates supported with high precision**
- **Port buffers for storing serial data when the Ethernet is offline**
- **Supports IPv6**
- **Ethernet redundancy (STP/RSTP/Turbo Ring) with network module**
- **Generic serial commands supported in Command-by-Command mode**

Overview

The NPort® 6450 is a 4-port device server that uses the SSL and SSH protocols to transmit encrypted serial data over Ethernet. Up to 4 serial devices of any type can be connected to the NPort® 6450, with all four devices using the same IP address. The Ethernet port can be configured for a normal or secure TCP/IP connection.

No Data Loss if Ethernet Connection Fails

The NPort® 6450 is a reliable device server that provides users with secure serial-to-Ethernet data transmission and a customer-oriented hardware design. If the Ethernet connection fails, the NPort® 6450 will queue all serial data in its internal 64 KB port buffer. When the Ethernet connection is re-established, the NPort® 6450 will immediately release all data in the buffer in the order that it was received. Users can increase the port buffer size by installing a SD card.

Specifications

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation: 1.5 kV built-in

Optical Fiber Interface (with network module)

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Serial Interface

Number of Ports: 4
Serial Standards: RS-232/422/485
Connector: DB9 male
RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)
Console Port: Serial port 1 doubles as RS-232 console port

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, DTR/DSR, XON/XOFF
Baudrate: 50 bps to 921.6 kbps (supports nonstandard baudrates)
Pull High/Low Resistor for RS-485: 1 kΩ, 150 kΩ

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Memory Expansion Slot

Slot Type: SD slot (supports up to 2 GB)

Software

Network Protocols: ICMP, IPv4/v6, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c/V3, HTTP, SMTP, ARP, PPPoE
Security Protocols: DES, 3DES, AES, SSH, SSL
Configuration Options: Web Console, Serial Console, Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X
Linux Real TTY Drivers: Linux 2.4.x, 2.6.x, 3.x
Management: SNMP MIB-II
IP Routing: Static, RIP-I, RIP-II

Operation Modes

Standard: Real COM, TCP Server, TCP Client, UDP, Pair Connection, RFC2217, Terminal, Reverse Telnet, Ethernet Modem, Printer, PPP, Disabled
Secure: Secure Real COM, Secure TCP Server, Secure TCP Client, Secure Pair Connection, SSH, Reverse SSH

Applications

Terminal Sessions: 8 sessions per port

Physical Characteristics

Housing: Metal
Weight: 1,020 g (2.25 lb)
Dimensions:
Without ears: 158 x 103 x 35 mm (6.22 x 4.06 x 1.38 in)
With ears: 181 x 103 x 35 mm (7.13 x 4.06 x 1.38 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current: 730 mA @ 12 VDC
Alarm Contact: Relay output with current-carrying capacity of 1 A @ 24 VDC
Power Line Protection: 1 kV burst (EN 61000-4-4: EFT/B), 1 kV surge (EN 61000-4-5)

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 1 kV; Signal: 1 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11 DIPs
Freefall: IEC-68-2-6, IEC-68-2-34, IEC-68-2-32
Vibration: IEC-68-2-6, IEC-68-2-34
Green Product: RoHS, CRoHS, WEEE
Transportation: NEMA TS2

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)

Time: 850,905 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

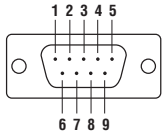
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Pin Assignment

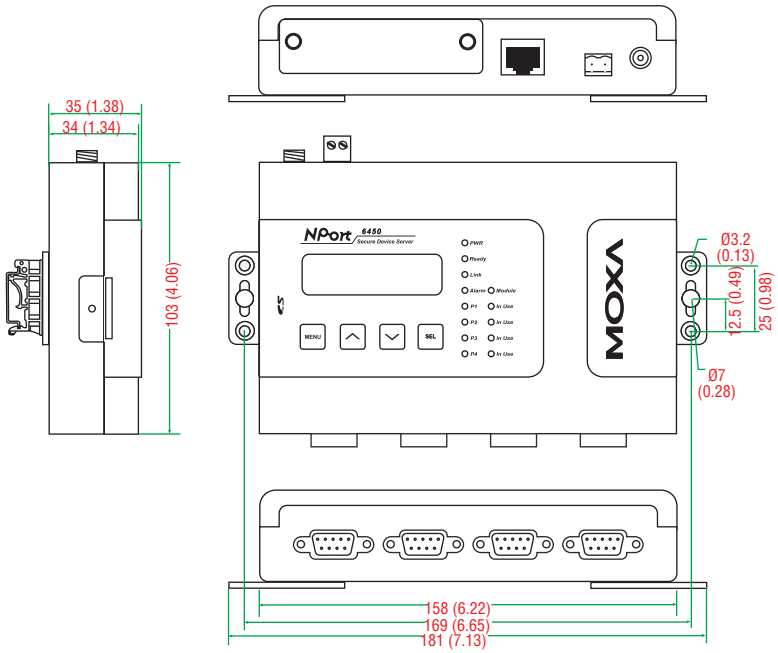
PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

DB9 male connector



Dimensions

Unit: mm (inch)



Note: The LCD panel and push buttons are only available with standard temperature models.

Ordering Information

Available Models

NPort 6450: 4-port secure device server, RS-232/422/485 to Ethernet
NPort 6450-T: 4-port secure device server, RS-232/422/485 to Ethernet, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DK35A: DIN-rail mounting kit, 35 mm, 2 DIN-rail plates with 4 screws
CBL-PJ21NOPEN-BK-30: Locking barrel plug to bare-wires cable
Mini DB9F-to-TB: DB9(F) to terminal block connector
Note: One power adapter suitable for your region is included in the product package. Additional power adapters can be purchased separately. Please refer to the Power Accessory Selection Guide for details.

Package Checklist

- 1 NPort 6450 secure device server
- 100 to 240 VAC power adapter (excluding T models)*
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

*For non-T models, the package includes one power adapter suitable for your region.

Expansion Modules			Use with the following NPort models					
			6150	6250	6450	6610-8 6650-8	6610-16 6650-16	6610-32 6650-32
NM-TX01 NM-TX01-T		1 10/100BaseT(X) port	–	–	✓	✓	✓	✓
NM-TX02 NM-TX02-T		2 10/100BaseT(X) ports	–	–	✓	✓	✓	✓
NM-FX01-S-SC NM-FX01-S-SC-T		1 100BaseFX port, single-mode, SC connector	–	–	✓	✓	✓	✓
NM-FX01-M-SC NM-FX01-M-SC-T		1 100BaseFX port, multi-mode, SC connector	–	–	✓	✓	✓	✓
NM-FX02-S-SC NM-FX02-S-SC-T		2 100BaseFX ports, single-mode, SC connector	–	–	✓	✓	✓	✓
NM-FX02-M-SC NM-FX02-M-SC-T		2 100BaseFX ports, multi-mode, SC connector	–	–	✓	✓	✓	✓

Note: Expansion modules can be purchased separately.

NPort® 6600 Series

8/16/32-port RS-232/422/485 rackmount secure terminal servers

NPort 6600-T

NPort 6600

- Up to 32 ports for high-density environments
- Nonstandard baudrates supported with high precision
- Port buffers for storing serial data when the Ethernet is offline
- Supports IPv6
- Ethernet redundancy (STP/RSTP/Turbo Ring) with network module
- Modular design for scalability
- DES/3DES/AES for highly secure data transmissions
- Universal high-voltage ranges: 100 to 240 VAC or 88 to 300 VDC
- Popular low-voltage ranges: ±48 VDC (20 to 72 VDC, -20 to -72 VDC)

Overview

The NPort® 6600 series of secure device servers is the right choice for applications that use large numbers of serial devices packed into a small space. Security breaches are intolerable and the NPort® 6600 ensures data transmission integrity with support of DES, 3DES, and AES encryption algorithms. Serial devices of any type can be connected to the NPort® 6600, and each serial port on the NPort® can be configured independently for RS-232, RS-422, or RS-485 transmission.

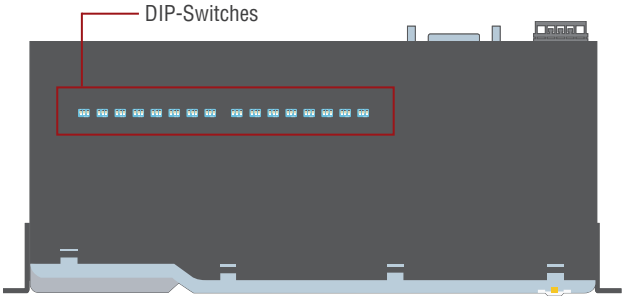
LCD Panel Makes Configuration Easy

The NPort® 6600 has a built-in LCD panel for configuration. The panel displays the server name, serial number, and IP address, and any of the device server's configuration parameters, such as IP address, netmask, and gateway address, can be updated easily and quickly.

Note: The LCD panel is only available with standard temperature models.

Adjustable Resistor Values for RS-485 Communication

The NPort® 6600 provides adjustable termination, pull high, and pull low resistors for RS-485 communication. In some critical environments, termination resistors may be needed to prevent the reflection of serial signals, and the pull high and pull low resistors may need adjusting to maintain the integrity of the electrical signal. Since no set of resistor values works for every environment, the NPort® 6600 allows manual adjustment of the resistor values for each serial port using built-in DIP switches.



Specifications

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation: 1.5 kV built-in

Optical Fiber Interface (with network module)

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Serial Interface

Number of Ports: 8, 16, or 32
Serial Standards:
NPort 6610: RS-232
NPort 6650: RS-232/422/485
Connector: 8-pin RJ45
RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)
Console Port: Dedicated RS-232 console port on rear panel (8-pin RJ45)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, DTR/DSR, XON/XOFF
Baudrate: 50 bps to 921.6 kbps (supports nonstandard baudrates)
Pull High/Low Resistor for RS-485: 1 kΩ, 150 kΩ
Terminator for RS-485: 120 Ω

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Memory Expansion Slot

Slot Type: SD slot (supports up to 2 GB)

Software

Network Protocols: ICMP, IPv4/v6, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c/V3, HTTP, SMTP, ARP, PPPoE
Security Protocols: DES, 3DES, AES, SSH, SSL
Configuration Options: Web Console, Serial Console, Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X
Linux Real TTY Drivers: Linux 2.4.x, 2.6.x, 3.x
Management: SNMP MIB-II
IP Routing: Static, RIP-I, RIP-II

Operation Modes

Standard: Real COM, TCP Server, TCP Client, UDP, Pair Connection, RFC2217, Terminal, Reverse Telnet, Ethernet Modem, Printer, PPP, Disabled
Secure: Secure Real COM, Secure TCP Server, Secure TCP Client, Secure Pair Connection, SSH, Reverse SSH

Applications

Terminal Sessions: 8 sessions per port

Physical Characteristics

Housing: Metal
Weight:
NPort 6600-8: 3,460 g (7.63 lb)
NPort 6600-16: 3,580 g (7.89 lb)
NPort 6600-32: 3,600 g (7.94 lb)
Dimensions:
Without ears: 440 x 195 x 44 mm (17.32 x 7.68 x 1.73 in)
With ears: 480 x 195 x 44 mm (18.9 x 7.68 x 1.73 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
High-Voltage Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature:
Standard Models: -40 to 75°C (-40 to 167°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
High-Voltage Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage:
AC Models: 100 to 240 VAC
DC Models: ±48 VDC (20 to 72 VDC, -20 to -72 VDC), 110 VDC (88 to 300 VDC)
Input Current:
AC Models:
140 mA @ 100 VAC (8 ports)
192 mA @ 100 VAC (16 ports)
285 mA @ 100 VAC (32 ports)
DC Models:
293 mA @ 48 VDC
200 mA @ 88 VDC
Alarm Contact: Relay output with current-carrying capacity of 1 A @ 24 VDC

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
NPort 6600-8/16/32:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power 1 kV; Signal 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11 DIPs
NPort 6600 48V models:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 1 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF

NPort 6650 HV models:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
Freefall: IEC-68-2-6, IEC-68-2-34, IEC-68-2-32
Vibration: IEC-68-2-6, IEC-68-2-34
Green Product: RoHS, CRoHS, WEEE
Transportation: NEMA TS2

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)

Time:
NPort 6610-8: 135,891 hrs
NPort 6610-16: 102,373 hrs
NPort 6610-32: 68,707 hrs
NPort 6650-8: 636,600 hrs
NPort 6650-16: 439,673 hrs
NPort 6650-32: 310,078 hrs
NPort 6650-8-HV-T: 501,171 hrs
NPort 6650-16-HV-T: 380,006 hrs
NPort 6650-32-HV-T: 290,914 hrs
Standard: Telcordia (Bellcore) Standard

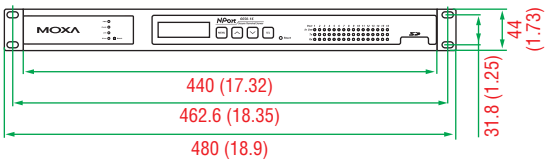
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions and Pin Assignment

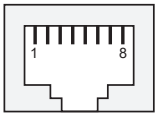
Unit: mm (inch)

Standard model



Wide temp. model

8-pin RJ45 connector



PIN	RS-232	RS-422/ 485-4W	RS-485-2w
1	DSR (in)	–	–
2	RTS (out)	TxD+	–
3	GND	GND	GND
4	TxD (out)	TxD-	–
5	RxD (in)	RxD+	Data+
6	DcD (in)	RxD-	Data-
7	CTS (in)	–	–
8	DTR (out)	–	–

Ordering Information

Available Models

NPort 6610-8: 8-port RS-232 to Ethernet secure terminal server, 100 to 240 VAC power input, 0 to 55°C operating temperature
NPort 6610-8-48V: 8-port RS-232 to Ethernet secure terminal server, ±48 VDC power input, 0 to 55°C operating temperature
NPort 6610-16: 16-port RS-232 to Ethernet secure terminal server, 100 to 240 VAC power input, 0 to 55°C operating temperature
NPort 6610-16-48V: 16-port RS-232 to Ethernet secure terminal server, ±48 VDC power input, 0 to 55°C operating temperature
NPort 6610-32: 32-port RS-232 to Ethernet secure terminal server, 100 to 240 VAC power input, 0 to 55°C operating temperature
NPort 6610-32-48V: 32-port RS-232 to Ethernet secure terminal server, ±48 VDC power input, 0 to 55°C operating temperature

Package Checklist

- 1 NPort 6600 secure device server
- Serial cable: CBL-RJ45M9-150
- Power cord (AC models only)*
- Rack-mounting kit: WK-44-01
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

*For AC models, the package includes one power cord suitable for your region.

NPort 6650-8: 8-port RS-232/422/485 to Ethernet secure terminal server, 100 to 240 VAC power input, 0 to 55°C operating temperature
NPort 6650-8-T: 8-port RS-232/422/485 to Ethernet secure terminal server, 100 to 240 VAC power input, -40 to 75°C operating temperature
NPort 6650-8-HV-T: 8-port RS-232/422/485 to Ethernet secure terminal server, 88 to 300 VDC power input, -40 to 85°C operating temperature
NPort 6650-8-48V: 8-port RS-232/422/485 to Ethernet secure terminal server, ±48 VDC power input, 0 to 55°C operating temperature
NPort 6650-16: 16-port RS-232/422/485 to Ethernet secure terminal server, 100 to 240 VAC power input, 0 to 55°C operating temperature
NPort 6650-16-48V: 16-port RS-232/422/485 to Ethernet secure terminal server, ±48 VDC power input, 0 to 55°C operating temperature
NPort 6650-16-T: 16-port RS-232/422/485 to Ethernet secure terminal server, 100 to 240 VAC power input, -40 to 75°C operating temperature
NPort 6650-16-HV-T: 16-port RS-232/422/485 to Ethernet secure terminal server, 88 to 300 VDC power input, -40 to 85°C operating temperature
NPort 6650-32: 32-port RS-232/422/485 to Ethernet secure terminal server, 100 to 240 VAC power input, 0 to 55°C operating temperature
NPort 6650-32-48V: 32-port RS-232/422/485 to Ethernet secure terminal server, ±48 VDC power input, 0 to 55°C operating temperature
NPort 6650-32-HV-T: 32-port RS-232/422/485 to Ethernet secure terminal server, 88 to 300 VDC power input, -40 to 85°C operating temperature

Optional Accessories (can be purchased separately)

Note: One power cord suitable for your region is included in the product package. Additional power cords can be purchased separately. Please refer to the Power Accessory Selection Guide for details.

Expansion Modules			Use with the following NPort models					
			6150	6250	6450	6610-8 6650-8	6610-16 6650-16	6610-32 6650-32
NM-TX01 NM-TX01-T		1 10/100BaseT(X) port	–	–	✓	✓	✓	✓
NM-TX02 NM-TX02-T		2 10/100BaseT(X) ports	–	–	✓	✓	✓	✓
NM-FX01-S-SC NM-FX01-S-SC-T		1 100BaseFX port, single-mode, SC connector	–	–	✓	✓	✓	✓
NM-FX01-M-SC NM-FX01-M-SC-T		1 100BaseFX port, multi-mode, SC connector	–	–	✓	✓	✓	✓
NM-FX02-S-SC NM-FX02-S-SC-T		2 100BaseFX ports, single-mode, SC connector	–	–	✓	✓	✓	✓
NM-FX02-M-SC NM-FX02-M-SC-T		2 100BaseFX ports, multi-mode, SC connector	–	–	✓	✓	✓	✓

Note: Expansion modules can be purchased separately.

CN2600 Series

8 and 16-port RS-232/422/485 terminal servers with dual-LAN redundancy

- LCD panel for easy IP address configuration (excluding wide temperature range models)
- Dual-LAN cards with two independent MAC addresses and IP addresses
- Redundant COM function available when both LANs are active
- Dual-host redundancy can be used to add a backup PC to your system
- Dual-AC-power inputs (for AC models only)
- Real COM/TTY drivers for Windows and Linux
- Universal high-voltage range: 100 to 240 VAC or 88 to 300 VDC

Overview

Redundancy is an important issue for industrial networks, and various types of solutions have been developed to provide alternative network paths when equipment or software failures occur. "Watchdog" hardware is installed to utilize redundant hardware, and a "Token"-switching software mechanism is applied. The CN2600 terminal server uses its built-in Dual-LAN ports to implement a "Redundant COM" mode that keeps your applications running uninterrupted.

Dual-LAN Redundancy

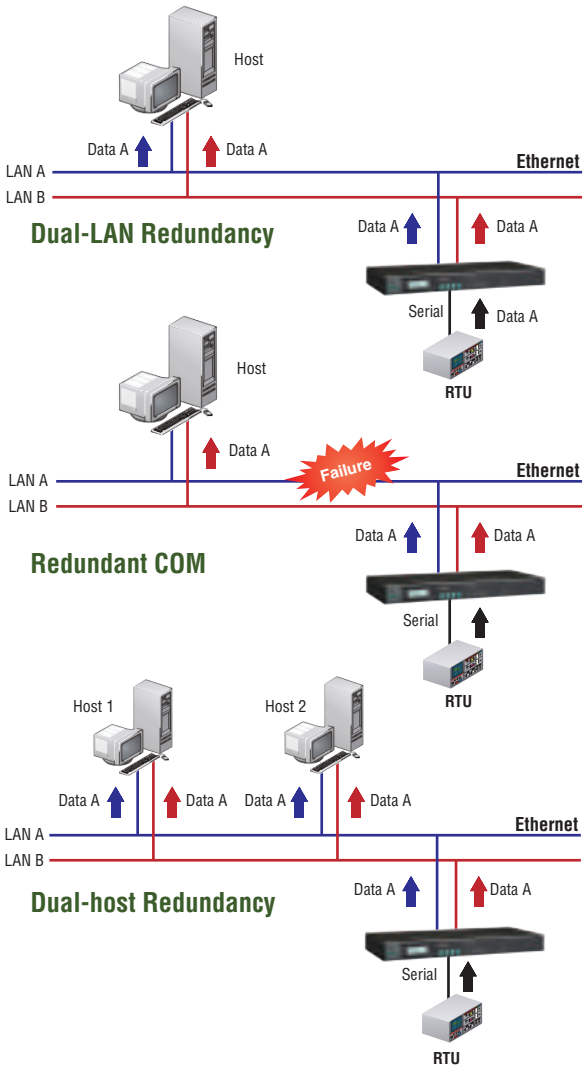
The CN2600 has two separate LAN ports that can be connected to separate LAN networks. Dual-LAN redundancy involves setting up two separate physical networks to connect the PC host with the CN2600 (the PC host also requires two LAN cards). If one connection fails, the PC host can still communicate with your serial devices over the alternative LAN connection.

Redundant COM

Moxa offers "Redundant COM", an easy-to-use application to provide an alternative solution for network redundancy. When the CN2600 receives a data packet from a connected device, two identical data packets are sent over two independent LAN connections to prevent lost data packets if one LAN connection becomes unavailable. The CN2600 software is programmed to automatically discard duplicate data packets.

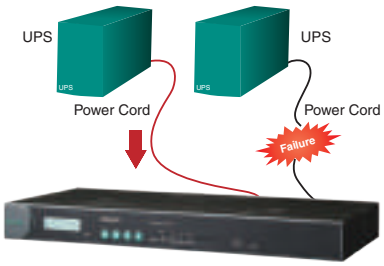
Dual-Host Redundancy

The CN2600's dual-LAN cards can also be used to set up "dual-host" redundancy. In this case, both networks (LAN A and LAN B in the figure) are connected to two different hosts. If either of the two hosts shuts down unexpectedly, the other host will still be able to communicate with serial devices connected to the CN2600.

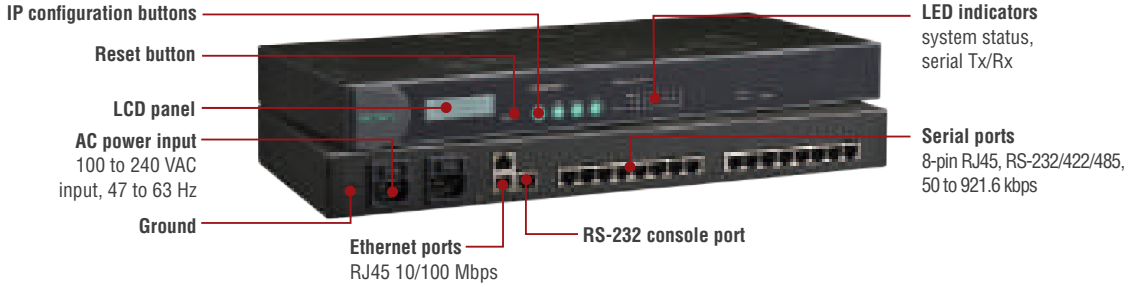


Dual-AC Model Supported

Dual-power redundancy uses two power inputs and redundant internal power supplies to ensure that all of the CN2600's functions will be available, even in the event of power circuit failures.



Appearance



Note: The product shown is the CN2610-8-2AC. HV models (CN2650I-8-HV-T and CN2650I-16-HV-T) use terminal blocks for their power input.
Note: LCD panel and configuration buttons are not available for wide temperature models

Specifications

Ethernet Interface

Number of Ports: 2 (2 IPs)
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation: 1.5 kV built-in

Serial Interface

Number of Ports: 8 or 16
Serial Standards:
CN2610: RS-232
CN2650/2650I: RS-232/422/485
Connector:
CN2610/2650: 8-pin RJ45
CN2650I: DB9 male
Serial Line Protection:
2 kV optical isolation (CN2650I)
RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)
Console Port: Dedicated RS-232 console port on rear panel (8-pin RJ45)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, DTR/DSR, XON/XOFF
Baudrate: 50 bps to 921.6 kbps
Pull High/Low Resistor for RS-485: 1 kΩ, 150 kΩ
Terminator for RS-485: 120 Ω

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IPv4, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP, HTTP, SMTP, ARP, PPPoE, DDNS
Security Protocols: RADIUS, HTTPS, SSH, PAP, CHAP
Configuration Options: Web Console, Serial Console, Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X
Linux Real TTY Drivers: Linux 2.4.x, 2.6.x, 3.x
Management: SNMP MIB-II
IP Routing: Static, RIP-I, RIP-II

Operation Modes

Standard: Real COM, TCP Server, TCP Client, UDP, RFC2217, Terminal, Reverse Telnet, PPP, DRDAS, Redundant COM, Disabled

Applications

Terminal Sessions: 8 sessions per port

Physical Characteristics

Housing: Metal
Weight:
CN2610-8-2AC: 3,760 g (8.29 lb)
CN2610-16-2AC: 3,980 g (8.77 lb)
CN2650-8: 3,740 g (8.25 lb)
CN2650-16: 3,790 g (8.36 lb)
CN2650-8-2AC: 3,900 g (8.60 lb)
CN2650-16-2AC: 3,980 g (8.77 lb)
CN2650I-8: 3,666 g (8.08 lb)
CN2650I-16: 3,776 g (8.32 lb)
CN2650I-8-2AC: 3,932 g (8.67 lb)
CN2650I-16-2AC: 4,022 g (8.87 lb)
CN2650I-8-HV: 3,910 g (8.62 lb)
CN2650I-16-HV: 3,930 g (8.66 lb)
Dimensions:
Without ears: 440 x 198 x 45.5 mm (17.32 x 7.80 x 1.77 in)
With ears: 480 x 198 x 45.5 mm (18.9 x 7.80 x 1.77 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
High-Voltage Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature:
Standard Models: -40 to 75°C (-40 to 167°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
High-Voltage Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage:
AC Models: 100 to 240 VAC, 47 to 63 Hz
DC Models: 110 VDC (88 to 300 VDC)
Input Current:
CN2600 AC models: 325 mA @ 100 VAC, 47 to 64 Hz
CN2650I HV models: 200 mA @ 88 VDC

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
AC models:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2.5 kV; Signal: 1 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11 DIPs

HVDC models:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m
IEC 61000-4-8 PFMF
Freefall: IEC-68-2-34, IEC-68-2-32
Vibration: IEC-68-2-6
Green Product: RoHS, CRoHS, WEEE

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)

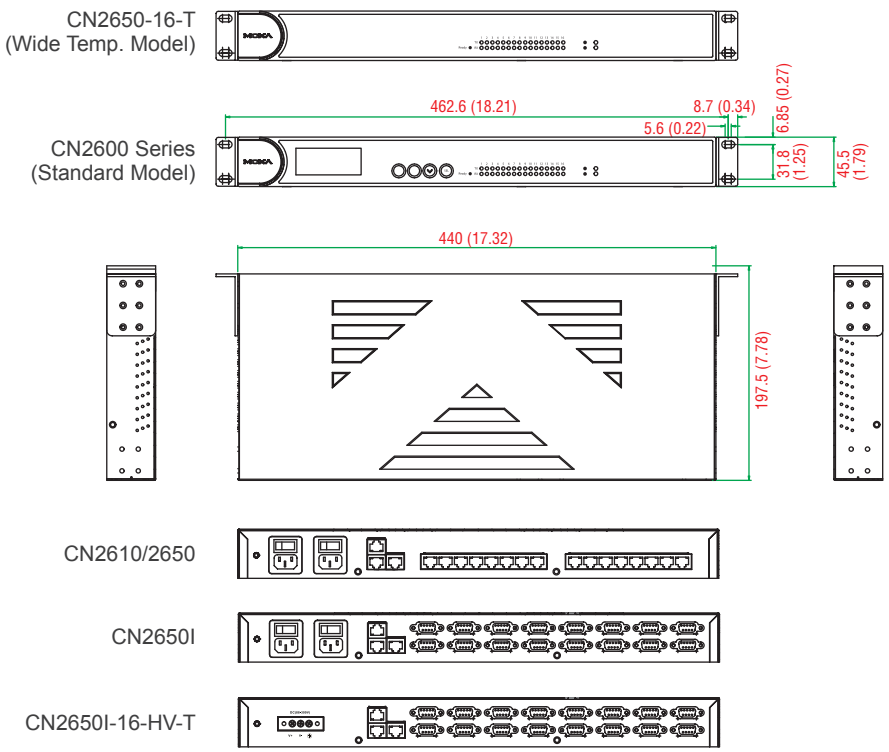
Time:
CN2610-8-2AC: 124,859 hrs
CN2610-16-2AC: 105,915 hrs
CN2650-8 series: 457,140 hrs
CN2650-16 series: 375,472 hrs
CN2650I-8 series: 190,562 hrs
CN2650I-16 series: 115,887 hrs
CN2650I-8-HV-T: 191,326 hrs
CN2650I-16-HV-T: 116,924 hrs
Standard:
CN2610-8-2AC, CN2610-16-2AC: MIL-HDBK-217F
CN2650-8/16, CN2650I-8/16, CN2650I-8/16-HV-T: Telcordia (Bellcore) Standard TR/SR

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

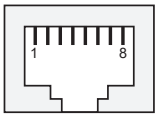
Unit: mm (inch)



Pin Assignment

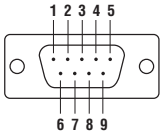
8-pin RJ45 connector

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DSR	–	–
2	RTS	TxD+(B)	–
3	GND	GND	GND
4	TxD	TxD-(A)	–
5	RxD	RxD+(B)	Data+(B)
6	DCD	RxD-(A)	Data-(A)
7	CTS	–	–
8	DTR	–	–



DB9 male connector

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–



Ordering Information

Available Models

CN2610-8: Dual-LAN terminal server with 8 RS-232 ports, 0 to 55°C operating temperature
CN2610-16: Dual-LAN terminal server with 16 RS-232 ports, 0 to 55°C operating temperature
CN2610-8-2AC: Dual-LAN, dual-AC-power terminal server with 8 RS-232 ports, 0 to 55°C operating temperature
CN2610-16-2AC: Dual-LAN, dual-AC-power terminal server with 16 RS-232 ports, 0 to 55°C operating temperature
CN2650-8: Dual-LAN terminal server with 8 RS-232/422/485 ports, 0 to 55°C operating temperature
CN2650-16: Dual-LAN terminal server with 16 RS-232/422/485 ports, 0 to 55°C operating temperature
CN2650-8-2AC: Dual-LAN, dual-AC-power terminal server with 8 RS-232/422/485 ports, 0 to 55°C operating temperature
CN2650-16-2AC: Dual-LAN, dual-AC-power terminal server with 16 RS-232/422/485 ports, 0 to 55°C operating temperature
CN2650I-8: Dual-LAN terminal server with 8 RS-232/422/485 ports and 2 kV optical isolation, 0 to 55°C operating temperature
CN2650I-16: Dual-LAN terminal server with 16 RS-232/422/485 ports and 2 kV optical isolation, 0 to 55°C operating temperature
CN2650I-8-2AC: Dual-LAN, dual-AC-power terminal server with 8 RS-232/422/485 ports and 2 kV optical isolation, 0 to 55°C operating temperature
CN2650I-16-2AC: Dual-LAN, dual-AC-power terminal server with 16 RS-232/422/485 ports and 2 kV optical isolation, 0 to 55°C operating temperature
CN2650-8-2AC-T: Dual-LAN, dual-AC-power terminal server with 8 RS-232/422/485 ports, -40 to 75°C operating temperature
CN2650-16-2AC-T: Dual-LAN, dual-AC-power terminal server with 16 RS-232/422/485 ports, -40 to 75°C operating temperature
CN2650I-8-HV-T: Dual-LAN terminal server with 8 RS-232/422/485 ports and 2 kV optical isolation, 88 to 300 VDC power input, -40 to 85°C operating temperature
CN2650I-16-HV-T: Dual-LAN terminal server with 16 RS-232/422/485 ports and 2 kV optical isolation, 88 to 300 VDC power input, -40 to 85°C operating temperature

Package Checklist

- 1 CN2600 terminal server
- Serial cable: CBL-RJ45F9-150
- Power cord (2AC models come with 2 cords)*
- Rack-mounting kit: WK-45-01
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

*For AC models, the package includes one power cord suitable for your region.

Optional Accessories (can be purchased separately)

Mini DB9F-to-TB: DB9(F) to terminal block connector (CN2650I only)
Note: One power cord suitable for your region is included in the product package. Additional power cords can be purchased separately. Please refer to the Power Accessory Selection Guide for details.

Power Accessory Selection Guide

Barrel Plug Type		Locking Barrel Plug	Power Cord					
O/P		12 VDC, 1.5 A, 100 to 240 VAC	10A/250V Power Cord, 183 cm					
Plug Type		CN	US	JP	EU	AU	UK	CN
Model Name		PWR-12150-CN-S2	PWC-C13US-3B-183	PWC-C13JP-3B-183	PWC-C13EU-3B-183	PWC-C13AU-3B-183	PWC-C13UK-3B-183	PWC-C13CN-3B-183
Appearance								
1 port	NPort 6150	✓	–	–	–	–	–	–
2 ports	NPort 6250	✓	–	–	–	–	–	–
	NPort 6250-M-SC	✓	–	–	–	–	–	–
	NPort 6250-S-SC	✓	–	–	–	–	–	–
4 ports	NPort 6450	✓	–	–	–	–	–	–
8 ports	NPort 6610-8	–	✓	✓	✓	✓	✓	✓
	NPort 6650-8	–	✓	✓	✓	✓	✓	✓
16 ports	NPort 6610-16	–	✓	✓	✓	✓	✓	✓
	NPort 6650-16	–	✓	✓	✓	✓	✓	✓
32 ports	NPort 6610-32	–	✓	✓	✓	✓	✓	✓

Barrel Plug Type		Locking barrel plug					
O/P		12 VDC, 2 A, 100 to 240 VDC (desktop type)	2.5A/250V Power Cord, 183 cm				
Plug Type		Must be used with one power cord	US	JP	EU	AU	UK
Model Name		PWR-12125-DT-S2	PWC-C7US-2B-183	PWC-C7JP-2B-183	PWC-C7EU-2B-183	PWC-C7AU-2B-183	PWC-C7UK-2B-183
Appearance							
1 port	NPort 6150	✓	✓	✓	✓	✓	✓
2 ports	NPort 6250	✓	✓	✓	✓	✓	✓
	NPort 6250-M-SC	✓	✓	✓	✓	✓	✓
	NPort 6250-S-SC	✓	✓	✓	✓	✓	✓
4 ports	NPort 6450	✓	✓	✓	✓	✓	✓
8 ports	NPort 6610-8	–	–	–	–	–	–
	NPort 6650-8	–	–	–	–	–	–
16 ports	NPort 6610-16	–	–	–	–	–	–
	NPort 6650-16	–	–	–	–	–	–
32 ports	NPort 6610-32	–	–	–	–	–	–

Serial-to-Ethernet Device Servers

Product Selection Guide

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Combo Switch / Serial Device Servers

NPort® S8000 Series: Combo switch / serial device servers 10-14

Railway Device Servers

NPort® 5000AI-M12 Series: Railway 1, 2, and 4-port RS-232/422/485 serial device servers 10-18

General-Purpose Device Servers

NPort® 5100A Series: 1-port RS-232/422/485 serial device servers 10-21
NPort® P5150A Series: 1-port RS-232/422/485 PoE serial device servers 10-24
NPort® 5200A Series: 2-port RS-232/422/485 serial device servers 10-26
NPort® 5100 Series: 1-port RS-232/422/485 serial device servers 10-29
NPort® 5200 Series: 2-port RS-232/422/485 serial device servers 10-31
NPort® 5400 Series: 4-port RS-232/422/485 serial device servers 10-34
NPort® 5600 Series: 8 and 16-port RS-232/422/485 rackmount serial device servers 10-37
NPort® 5600-8-DT Lite: 8-port RS-232/422/485 serial device servers 10-41

Industrial-Grade Device Servers

NPort® IA5000A Series: 1, 2, and 4-port serial device servers for industrial automation 10-43
NPort® IA5000 Series: 1 and 2-port serial device servers for industrial automation 10-47

Wireless Device Servers

NPort® W2150A/W2250A: 1 and 2-port RS-232/422/485 IEEE 802.11a/b/g wireless device servers 10-51

ZigBee Device Servers

NPort® Z2150/Z3150 Series: 1-port RS-232/422/485 to ZigBee converter or ZigBee-to-Ethernet gateway 10-54

Power Accessories

Power Accessory Selection Guide 10-57

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Serial-to-Ethernet Device Servers

Combo Switch / Serial Device Servers

NPort S8455I/S8458: Ethernet Switch Specifications	
Ethernet Interface	
Standards	IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT(X) and 100BaseFX IEEE 802.3x for Flow Control IEEE 802.1D for Spanning Tree Protocol IEEE 802.1w for Rapid STP IEEE 802.1Q for VLAN Tagging IEEE 802.1p for Class of Service IEEE 802.1X for Authentication IEEE 802.3ad for Port Trunk with LACP
Network Protocols	ICMP, IPv4, TCP, UDP, ARP, Telnet, DNS, HTTP, SMTP, SNTP, IGMPv1/v2 device, GVRP, SNMPv1/v2c/v3, DHCP Server/ Client, DHCP Option 82, BootP, TFTP, SNTP, SMTP, RARP, GMRP, LACP, RMON
MIB	MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control	IEEE 802.3x flow control, back pressure flow control interface
Switch Properties	
Priority Queues	4
"Max. Number of Available VLANs"	64
VLAN ID Range	VID 1 to 4094
IGMP Groups	256
Switch Interface	
Optical Fiber Interface	Multi-mode or Single-mode
RJ45 Ports	10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
DIP Switches	Turbo Ring, Master, Coupler, Reserve
Alarm Contact	2 relay outputs with current-carrying capacity of 1 A @ 24 VDC

NPort S8455I/S8458: Device Server Specifications	
Serial Interface	
Number of Ports	4
Serial Standards	RS-232/422/485
Connector	DB9 male
Serial Line Protection	2 kV isolation protection
RS-485 Data Direction Control	ADDC® (Automatic Data Direction Control)
Pull High/Low Resistor for RS-485	1 kΩ, 150 kΩ
Terminator for RS-485	120 Ω
Console Port	Dedicated RS-232 console port (8-pin RJ45)
Serial Communication Parameters	
Data Bits	5, 6, 7, 8
Stop Bits	1, 1.5, 2
Parity	None, Even, Odd, Space, Mark
Flow Control	RTS/CTS and XON/XOFF
Baudrate	50 bps to 921.6 kbps
Serial Signals	
RS-232	TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422	Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w	Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w	Data+, Data-, GND
Software	
Configuration Options	Web Console, Telnet Console, Serial Console, Windows Utility
Windows Real COM Drivers	Windows 95/98/ME/NT/2000, Windows XP/2003/ Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x, 3.x
Operation Modes	Real COM, TCP Server, TCP Client, UDP, RFC2217
Management	SNMP MIB-II
IP Routing	Static, RIP-I, RIP-II
Reliability	
Alert Tools	Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger	Built-in WDT (watchdog timer)

NPort S8455I/S8458: General Specifications		
Port Summary		
Serial Ports		4 RS-232/422/485 ports
Ethernet Switch Ports		NPort S8455I fiber: 3 RJ45 copper ports, 2 multi-mode/ single-mode fiber ports NPort S8455I all copper: 5 RJ45 copper ports NPort S8458: 4 RJ45 copper ports and 4 single-mode fiber ports
Console Ports		1 (8-pin RJ45 connector)
LED Indicators		PWR1, PWR2, READY, MASTER, COUPLER, LINK4, LINK5
Physical Characteristics		
Housing		Metal
Weight		NPort S8455I series: 578 g (1.27 lb) NPort S8458 series: 1,105 g (2.44 lb)
Dimensions		NPort S8455I series: 73.1 x 134 x 105 mm (2.88 x 5.27 x 4.92 in) NPort S8458 series: 93 x 144 x 125 mm (3.66 x 5.64 x 4.92 in)
Environmental Limits		
Operating Temperature	Standard Temperature	0 to 60°C (32 to 140°F)
	Wide Temperature	NPort S8455I-T: -40 to 75°C (-40 to 167°F) NPort S8458-T: -40 to 85°C (-40 to 185°F)
Operating Humidity		5 to 95% (non-condensing)
Storage Temperature		-40 to 75°C (-40 to 167°F)
Power Requirements		
Input Voltage		12 to 48 VDC
Input Current		NPort S8458: 940 mA @ 12 VDC NPort S8455I: 935 mA @ 12 VDC
Standards and Certifications		
Safety		UL 508, UL 60950-1
EMC		EN 55022/24
EMI		CISPR 22, FCC Part 15B Class A
EMS		NPort S8455I: IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV IEC 61000-4-5 Surge: Power: 1 kV (4 kV for all copper models); Signal: 0.25 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m; Signal: 10 V/m IEC 61000-4-8 PFMF NPort S8458 series: IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m; Signal: 10 V/m IEC 61000-4-8 PFMF
Reliability		
Buzzer, RTC, WDT		✓
MTBF		Time: NPort S8455I Single-mode: 286,993 hrs NPort S8455I Multi-mode: 200,951 hrs NPort S8455I All copper: 287,354 hrs NPort S8458: 163,624 hrs Standard: Telcordia (Bellcore) Standard TR/SR
Warranty		5 years (see www.moxa.com/warranty)
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Railway Device Servers

		NPort 5150AI-M12/ NPort 5150AI-M12-T/ NPort 5150AI-M12-CT	NPort 5250AI-M12/ NPort 5250AI-M12-T/ NPort 5250AI-M12-CT	NPort 5450AI-M12/ NPort 5450AI-M12-T/ NPort 5450AI-M12-CT
Ethernet Interface				
10/100BaseT(X) Ports		1	1	1
Connector		M12	M12	M12
Serial Interface				
RS-232/422/485 Ports		1	2	4
Connector		DB9 male	DB9 male	DB9 male
Serial Communication Parameters		Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark		
Flow Control		RTS/CTS, DTR/DSR, XON/XOFF		
Baudrate		50 bps to 921.6 kbps		
Software				
Network Protocols		ICMP, IPv4, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, IGMP V1/2, LLDP, ARP		
Configuration Options		Web Console, Telnet Console, Windows Search Utility		
Windows Real COM Drivers		Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded		
Fixed TTY Drivers		SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X		
Linux Real TTY Drivers		Linux 2.4.x, 2.6.x, 3.x		
Physical Characteristics				
Housing		Metal, IP40 protection		
Weight		686 g (1.51 lb)		
Dimensions		80 x 216.6 x 52.9 mm (3.15 x 8.53 x 2.08 in)		
Environmental Limits				
Operating Temperature	Standard Temperature	-25 to 55°C (-13 to 131°F)		
	Wide Temperature	-40 to 75°C (-40 to 167°F)		
Operating Humidity		5 to 95% (non-condensing)		
Storage Temperature		-40 to 85°C (-40 to 185°F)		
Power Requirements				
Input Voltage		12 to 48 VDC		
Input Current		310 mA @ 12 VDC	360 mA @ 12 VDC	440 mA @ 12 VDC
Connector		M12		
Standards and Certifications				
Safety		UL 60950-1		
EMC		EN 55022/24		
EMI		CISPR 22, FCC Part 15B Class A		
EMS		IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power 2 kV; Signal 2 kV IEC 61000-4-5 Surge: Power 0.5 kV; Signal: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz, 10 V/m; Signal: 10 V/m IEC 61000-4-8 PFMF		
Rail Traffic		EN 50155 (essential compliance*), EN 50121-4		
Vibration		IEC 60068-2-6		
Reliability				
Comformal Coating		Yes (-CT model only)	Yes (-CT model only)	Yes (-CT model only)
Buzzer, RTC, WDT		Yes	Yes	Yes
MTBF		Time: 789,341 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 639,622 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 467,777 hrs Standard: Telcordia (Bellcore) Standard TR/SR
Warranty		5 years (see www.moxa.com/warranty)		
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*Moxa defines “essential compliance” to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

General-Purpose Device Servers

	NPort 5110A NPort 5110A-T	NPort 5130A NPort 5130A-T	NPort 5150A NPort 5150A-T	NPort P5150A NPort P5150A-T	NPort 5110 NPort 5110-T	NPort 5130	NPort 5150
Ethernet Interface							
10/100BaseT(X) Ports	1	1	1	1	1	1	1
Connector	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45
Magnetic Isolation Protection	1.5 kV	1.5 kV	1.5 kV	1.5 kV	1.5 kV	1.5 kV	1.5 kV
Serial Interface							
RS-232 Ports	1	–	–	–	1	–	–
RS-422/485 Ports	–	1	–	–	–	1	–
RS-232/422/485 Ports	–	–	1	1	–	–	1
Connector	DB9-M	DB9-M	DB9-M	DB9-M	DB9-M	DB9-M	DB9-M
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark						
Flow Control	RTS/CTS, XON/XOFF						
Baudrate	50 bps to 921.6 kbps				110 bps to 230.4 kbps	50 bps to 921.6 kbps	
Software							
Network Protocols	ICMP, IPv4, ARP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, IGMP V1/2				ICMP, IPv4, ARP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP		
Configuration Options	Web Console, Telnet Console, Serial Console, Windows Utility	Web Console, Telnet Console, Windows Utility	Web Console, Telnet Console, Serial Console, Windows Utility			Web Console, Telnet Console, Windows Utility	Web Console, Telnet Console, Serial Console, Windows Utility
Windows Real COM Drivers	Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded						
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X						
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x, 3.x						
Physical Characteristics							
Housing	Metal						
Weight	340 g (0.75 lb)			300 g (0.66 lb)	340 g (0.75 lb)		
Dimensions	52 x 80 x 22 mm (2.05 x 3.15 x 0.87 in)			77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)	52 x 80 x 22 mm (2.05 x 3.15 x 0.87 in)		
Environmental Limits							
Operating Temperature – Standard Temperature	0 to 60°C (32 to 140°F)				0 to 55°C (32 to 131°F)		
Operating Temperature – Wide Temperature	-40 to 75°C (-40 to 167°F)				-40 to 75°C (-40 to 167°F)	–	
Operating Humidity	5 to 95% (non-condensing)						
Storage Temperature	-40 to 75°C (-40 to 167°F)						
Power Requirements							
Input Voltage	12 to 48 VDC						
Input Current	82.5 mA @ 12 VDC	89.1 mA @ 12 VDC	92.4 mA @ 12 VDC	DC Jack I/P: 125 mA @ 12 VDC; PoE I/P: 180 mA @ 48 VDC	128.7 mA @ 12 VDC	200 mA @ 12 VDC	200 mA @ 12 VDC
Standards and Certifications							
Safety	UL 60950-1						
EMC	EN 55022/24						
EMI	CISPR 22, FCC Part 15B Class A						
EMS	IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 0.5 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m; Signal: 10 V/m IEC 61000-4-8 PFMF IEC 61000-4-11 Dips			IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz, 3 V/m; Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11 Dips	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 1 kV IEC 61000-4-5 Surge: Power: 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11 Dips		
Reliability							
Buzzer, RTC, WDT	WDT only						
MTBF	Time: 2,231,530 hrs Standard: Telcordia (Bellcore) Standard TR/SR				Time: 3,126,448 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 2,836,863 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 2,736,202 hrs Standard: Telcordia (Bellcore) Standard TR/SR
Warranty	5 years (see www.moxa.com/warranty)						
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General-Purpose Device Servers

	NPort 5210A NPort 5210A-T	NPort 5230A NPort 5230A-T	NPort 5250A NPort 5250A-T	NPort 5210 NPort 5210-T	NPort 5230 NPort 5230-T	NPort 5232 NPort 5232-T	NPort 5232I NPort 5232I-T
Ethernet Interface							
10/100BaseT(X) Ports	1	1	1	1	1	1	1
Connector	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45
Magnetic Isolation Protection	1.5 kV	1.5 kV	1.5 kV	1.5 kV	1.5 kV	1.5 kV	1.5 kV
Serial Interface							
RS-232 Ports	2	–	–	2	1	–	–
RS-422/485 Ports	–	2	–	–	1	2	2
RS-232/422/485 Ports	–	–	2	–	–	–	–
Connector	DB9-M	Terminal Block	DB9-M	RJ45	Terminal Block	Terminal Block	Terminal Block
2 kV Isolation Protection	–	–	–	–	–	–	✓
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark						
Flow Control	RTS/CTS, XON/XOFF						
Baudrate	50 bps to 921.6 kbps			110 bps to 230.4 kbps			
Software							
Network Protocols	ICMP, IPv4, ARP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, IGMP V1/2			ICMP, IPv4, ARP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP			
Configuration Options	Web Console, Telnet Console, Serial Console, Windows Utility	Web Console, Telnet Console, Windows Utility	Web Console, Telnet Console, Serial Console, Windows Utility			Web Console, Telnet Console, Windows Utility	
Windows Real COM Drivers	Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded						
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X						
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x, 3.x						
Physical Characteristics							
Housing	Metal						
Weight	340 g (0.75 lb)				360 g (0.79 lb)		380 g (0.84 lb)
Dimensions	77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)			67 x 100.4 x 22 mm (2.64 x 3.95 x 0.87 in)			67 x 100.4 x 35 mm (2.64 x 3.95 x 0.87 in)
Environmental Limits							
Operating Temperature – Standard Temperature	0 to 60°C (32 to 140°F)			0 to 55°C (32 to 131°F)			
Operating Temperature – Wide Temperature	-40 to 75°C (-40 to 167°F)						
Storage Temperature	-40 to 75°C (-40 to 167°F)						
Operating Humidity	5 to 95% (non-condensing)						
Power Requirements							
Input Voltage	12 to 48 VDC						
Input Current	119 mA @ 12 VDC			325 mA @ 12 VDC	325 mA @ 12 VDC	280 mA @ 12 VDC	365 mA @ 12 VDC
Standards and Certifications							
Safety	UL 60950-1						
EMC	EN 55022/24						
EMI	CISPR 22, FCC Part 15B Class A						
EMS	IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m; Signal: 10 V/m IEC 61000-4-8 PFMF IEC 61000-4-11 Dips			IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11 Dips			
Marine	–	–	–	–	DNV	DNV	DNV
Reliability							
Buzzer, RTC, WDT	✓						
MTBF	Time: 847,750 hrs Standard: Telcordia (Bellcore) Standard TR/SR			Time: 381,342 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 377,937 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 309,383 hrs Standard: Telcordia (Bellcore) Standard TR/SR	
Warranty	5 years (see www.moxa.com/warranty)						
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General-Purpose Device Servers

	NPort 5410	NPort 5430	NPort 5430I	NPort 5450 NPort 5450-T	NPort 5450I NPort 5450I-T
Ethernet Interface					
10/100BaseT(X) Ports	1	1	1	1	1
Connector	RJ45	RJ45	RJ45	RJ45	RJ45
Magnetic Isolation Protection	1.5 kV	1.5 kV	1.5 kV	1.5 kV	1.5 kV
Serial Interface					
RS-232 Ports	4	–	–	–	–
RS-422/485 Ports	–	4	4	–	–
RS-232/422/485 Ports	–	–	–	4	4
Connector	DB9-M	Terminal Block	Terminal Block	DB9-M	DB9-M
2 kV Isolation Protection	–	–	✓	–	✓
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark				
Flow Control	RTS/CTS, XON/XOFF				
Baudrate	50 bps to 921.6 kbps				
Software					
Network Protocols	ICMP, IPv4, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, SNTP, ARP				
Configuration Options	Web Console, Telnet Console, Windows Utility				
Windows Real COM Drivers	Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded				
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X				
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x, 3.x				
Onsite Configuration					
Mini Screen with Push Buttons	✓	✓	✓	✓ (excluding T models)	✓ (excluding T models)
Physical Characteristics					
Housing	Metal				
Weight	740 g (1.63 lb)	740 g (1.63 lb)	740 g (1.63 lb)	740 g (1.63 lb)	740 g (1.63 lb)
Dimensions	158 x 103 x 33 mm (6.22 x 4.06 x 1.30 in)				
Environmental Limits					
Operating Temperature – Standard Temperature	0 to 55°C (32 to 131°F)				
Operating Temperature – Wide Temperature	–	–	–	-40 to 75°C (-40 to 167°F)	
Operating Humidity	5 to 95% (non-condensing)				
Storage Temperature	-20 to 70°C (-4 to 158°F)			-40 to 75°C (-40 to 167°F)	
Power Requirements					
Input Voltage	12 to 48 VDC				
Input Current	350 mA @ 12 VDC	320 mA @ 12 VDC	530 mA @ 12 VDC	350 mA @ 12 VDC	554 mA @ 12 VDC
Standards and Certifications					
Safety	UL 60950-1				
EMC	EN 55022/24				
EMI	CISPR 22, FCC Part 15B Class A				
EMS	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11 Dips	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 1 kV; Signal: 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11 Dips		IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11 Dips	IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 2.5 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV IEC 61000-4-5 Surge: Power 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11 Dips
Marine	DNV (standard temp. models only)				
Medical	EN 60601-1-2 Class B, EN 55011 (NPort 5410, 5450, and 5450I only)				
Reliability					
Buzzer, RTC, WDT	✓				
MTBF	Time: 310,331 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 265,650 hrs Standard: Telcordia (Bellcore) Standard TR/SR		Time: 206,903 hrs Standard: Telcordia (Bellcore) Standard TR/SR	
Warranty	5 years (see www.moxa.com/warranty)				
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General-Purpose Device Servers

	NPort 5610-8	NPort 5610-8-48V	NPort 5610-16	NPort 5610-16-48V	NPort 5630-8	NPort 5630-16	NPort 5650-8 NPort 5650-8-T
Ethernet Interface							
10/100BaseT(X) Ports	1	1	1	1	1	1	1
Connector	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45
Magnetic Isolation Protection	1.5 kV	1.5 kV	1.5 kV	1.5 kV	1.5 kV	1.5 kV	1.5 kV
Serial Interface							
RS-232 Ports	8	8	16	16	–	–	–
RS-422/485 Ports	–	–	–	–	8	16	–
RS-232/422/485 Ports	–	–	–	–	–	–	8
Connector	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark						
Flow Control	RTS/CTS, XON/XOFF						
Baudrate	50 bps to 921.6 kbps						
Software							
Network Protocols	ICMP, IPv4, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, SNTP, ARP, PPP, SLIP, RFC2217						
Configuration Options	Web Console, Telnet Console, Windows Utility						
Windows Real COM Drivers	Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded						
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X						
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x, 3.x						
Onsite Configuration							
Mini Screen with Push Buttons	✓	✓	✓	✓	✓	✓	✓ (excluding T models)
Physical Characteristics							
Housing	Metal						
Weight	3,340 g (7.36 lb)	3,160 g (6.97 lb)	3,420 g (7.54 lb)	3,260 g (7.19 lb)	3,380 g (7.45 lb)	3,400 g (7.50 lb)	3,360 g (7.41 lb)
Dimensions	440 x 45 x 198 mm (18.9 x 1.77 x 7.80 in)						
Environmental Limits							
Operating Temperature – Standard Temperature	0 to 55°C (32 to 131°F)						
Operating Temperature – Wide Temperature	–	–	–	–	–	–	-40 to 75°C (-40 to 167°F)
Operating Humidity	5 to 95% (non-condensing)						
Storage Temperature	-20 to 70°C (-4 to 158°F)						-40 to 75°C (-40 to 167°F)
Power Requirements							
Input Voltage	100 to 240 VAC, 47 to 63 Hz	±48 VDC	100 to 240 VAC, 47 to 63 Hz	±48 VDC	100 to 240 VAC, 47 to 63 Hz		
Input Current	141 mA @ 100 VAC, 47 to 63 Hz	135 mA @ 48 VDC	141 mA @ 100 VAC, 47 to 63 Hz	135 mA @ 48 VDC	152 mA @ 100 VAC, 47 to 63 Hz	152 mA @ 100 VAC, 47 to 63 Hz	158 mA @ 100 VAC, 47 to 63 Hz
Standards and Certifications							
Safety	UL 60950-1						
EMC	EN 55022/24						
EMI	CISPR 22, FCC Part 15B Class A						
EMS	IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2.5 kV; Signal: 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11 Dips						
Medical	EN 60601-1-2 Class B, EN 55011						
Reliability							
Buzzer, RTC, WDT	✓						
MTBF	Time: 97,294 hrs Standard: MIL-HDBK-217F	Time: 96,758 hrs Standard: MIL-HDBK-217F	Time: 94,928 hrs Standard: MIL-HDBK-217F	Time: 926,643 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 118,405 hrs Standard: MIL-HDBK-217F	Time: 91,483 hrs Standard: MIL-HDBK-217F	Time: 117,584 hrs Standard: MIL-HDBK-217F
Warranty	5 years (see www.moxa.com/warranty)						
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General-Purpose Device Servers

	NPort 5650-8-M-SC	NPort 5650-8-S-SC	NPort 5650-8-HV-T	NPort 5650-16 NPort 5650-16-T	NPort 5650-16-M-SC	NPort 5650-16-S-SC	NPort 5650-16-HV-T
Ethernet Interface							
10BaseT Ports	–	–	–	–	–	–	–
10/100BaseT(X) Ports	–	–	1	1	–	–	1
100BaseFX Ports	1 (multi-mode)	1 (single-mode)	–	–	1 (multi-mode)	1 (single-mode)	–
Connector	SC	SC	RJ45	RJ45	SC	SC	RJ45
Magnetic Isolation Protection	–	–	1.5 kV	1.5 kV	–	–	1.5 kV
Serial Interface							
RS-232 Ports	–	–	–	–	–	–	–
RS-422/485 Ports	–	–	–	–	–	–	–
RS-232/422/485 Ports	8	8	8	16	16	16	16
Connector	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45
2 kV Isolation Protection	–	–	–	–	–	–	–
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark						
Flow Control	RTS/CTS, XON/XOFF						
Baudrate	50 bps to 921.6 kbps						
Software							
Network Protocols	ICMP, IPv4, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, SNTP, ARP, PPP, SLIP,RFC2217						
Configuration Options	Web Console, Telnet Console, Windows Utility						
Windows Real COM Drivers	Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded						
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X						
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x, 3.x						
Onsite Configuration							
Mini Screen with Push Buttons	✓	✓	–	✓ (excluding T models)	✓	✓	–
Physical Characteristics							
Housing	Metal						
Weight	3,380 g (7.45 lb)	3,380 g (7.45 lb)	3,720 g (8.20 lb)	3,460 g (7.63 lb)	3,440 g (7.58 lb)	3,440 g (7.58 lb)	3,820 g (8.42 lb)
Dimensions	440 x 45 x 198 mm (18.9 x 1.77 x 7.80 in)						
Environmental Limits							
Operating Temperature (Standard Temperature)	0 to 55°C (32 to 131°F)		–	0 to 55°C (32 to 131°F)			–
Operating Temperature (Wide Temperature)	–	–	-40 to 85°C (-40 to 185°F)	-40 to 75°C (-40 to 167°F)	–	–	-40 to 85°C (-40 to 185°F)
Operating Humidity	5 to 95% (non-condensing)						
Storage Temperature	-20 to 70°C (-4 to 158°F)		-40 to 85°C (-40 to 185°F)	-40 to 75°C (-40 to 167°F)	-20 to 70°C (-4 to 158°F)		-40 to 85°C (-40 to 185°F)
Power Requirements							
Input Voltage	100 to 240 VAC, 47 to 63 Hz	100 to 240 VAC, 47 to 63 Hz	110 VDC (88 to 300 VDC)	100 to 240 VAC, 47 to 63 Hz	100 to 240 VAC, 47 to 63 Hz	100 to 240 VAC, 47 to 63 Hz	110 VDC (88 to 300 VDC)
Input Current	174 mA @ 100 VAC, 47 to 63 Hz	164 mA @ 100 VAC, 47 to 63 Hz	152 mA @ 88 VDC	158 mA @ 100 VAC, 47 to 63 Hz	174 mA @ 100 VAC, 47 to 63 Hz	164 mA @ 100 VAC, 47 to 63 Hz	152 mA @ 88 VDC
Standards and Certifications							
Safety	UL 60950-1						
EMC	EN 55022/24						
EMI	CISPR 22, FCC Part 15B Class A						
EMS	IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2.5 kV; Signal: 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11 Dips		IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m IEC 61000-4-8 PFMF	IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power 2.5 kV; Signal 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11 Dips			IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m IEC 61000-4-8 PFMF
Medical	EN 60601-1-2 Class B, EN 55011						
Reliability							
Buzzer, RTC, WDT	✓						
MTBF	Time: 116,914 hrs Standard: MIL-HDBK-217F		Time: 725,390 hrs Standard: Telcordia (Bellcore) Standard TR/SR	104,767 hrs	Time: 87,528 hrs Standard: MIL-HDBK-217F		Time: 531,264 hrs Standard: Telcordia (Bellcore) Standard TR/SR
Warranty	5 years (see www.moxa.com/warranty)						
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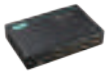
General-Purpose Device Servers



	NPort 5610-8-DTL NPort 5610-8-DTL-T	NPort 5650-8-DTL NPort 5650-8-DTL-T	NPort 5650I-8-DTL NPort 5650I-8-DTL-T
Ethernet Interface			
10/100BaseT(X) Ports	1	1	1
Connector	RJ45	RJ45	RJ45
Magnetic Isolation Protection	1.5 kV	1.5 kV	1.5 kV
Serial Interface			
RS-232 Ports	8	–	–
RS-422/485 Ports	–	–	–
RS-232/422/485 Ports	–	8	8
Connector	DB9-M	DB9-M	DB9-M
2 kV Isolation Protection	–	–	✓
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark		
Flow Control	RTS/CTS, XON/XOFF		
Baudrate	50 bps to 921.6 kbps		
Software			
Network Protocols	ICMP, IPv4, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, SNTP, ARP, RFC2217		
Configuration Options	Web Console, Serial Console, Telnet Console, Windows Utility		
Windows Real COM Drivers	Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded		
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X		
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x, 3.x		
Onsite Configurations			
Mini Screen with Push Buttons	–	–	–
Physical Characteristics			
Housing	Metal		
Weight	1,760 g (3.88 lb)	1,770 g (3.90 lb)	1,850 g (4.08 lb)
Dimensions	197 x 44 x 125 mm (7.76 x 1.73 x 4.92 in)		
Environmental Limits			
Operating Temperature – Standard Temperature	0 to 60°C (32 to 140°F)		
Operating Temperature – Wide Temperature	-40 to 75°C (-40 to 167°F)		
Operating Humidity	5 to 95% (non-condensing)		
Storage Temperature	-40 to 75°C (-40 to 167°F)		
Power Requirements			
Input Voltage	12 to 48 VDC		
Input Current	340 mA @ 12 VDC	470 mA @ 12 VDC	740 mA @ 12 VDC
Standards and Certifications			
Safety	UL 60950-1		
EMC	EN 55022/24		
EMI	CISPR 22, FCC Part 15B Class A		
EMS	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11 Dips		
Reliability			
Buzzer, RTC, WDT	✓		
MTBF	Time: 953,388 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 740,457 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 258,150 hrs Standard: Telcordia (Bellcore) Standard TR/SR
Warranty	5 years (see wwwmoxacom/warranty)		
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Industrial-Grade Device Servers

		NPort IA5150A NPort IA5150A-T	NPort IA5150AI NPort IA5150AI-T	NPort IA5250A NPort IA5250A-T	NPort IA5250AI NPort IA5250AI-T	NPort IA5450A NPort IA5450A-T	NPort IA5450AI NPort IA5450AI-T
Ethernet Interface							
10/100BaseT(X) Ports		2 (2 IPs)	2 (2 IPs)	2 (2 IPs)	2 (2 IPs)	2 (2 IPs)	2 (2 IPs)
Connector		RJ45	RJ45	RJ45	RJ45	RJ45	RJ45
Magnetic Isolation Protection		1.5 kV	1.5 kV	1.5 kV	1.5 kV	1.5 kV	1.5 kV
Serial Interface							
RS-232/422/485 Ports		1	1	2	2	4	4
Connector		DB9-M/Terminal Block	DB9-M/Terminal Block	DB9-M	DB9-M	DB9-M	DB9-M
2 kV Isolation Protection		–	✓	–	✓	–	✓
Serial Communication Parameters		Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark					
Flow Control		RTS/CTS, XON/XOFF					
Baudrate		50 bps to 921.6 kbps					
Software							
Network Protocols		ICMP, IPv4, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, SNTP, IGMP, ARP					
Configuration Options		Web Console, Serial Console, Telnet Console, Windows Utility					
Windows Real COM Drivers		Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded					
Fixed TTY Drivers		SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X					
Linux Real TTY Drivers		Linux 2.4.x, 2.6.x, 3.x					
Physical Characteristics							
Housing		Metal					
Weight		475 g (1.05 lb)		485 g (1.07 lb)		560 g (1.23 lb)	
Dimensions		36 x 105 x 140 mm (1.42 x 4.13 x 5.51 in)				45.8 x 134 x 105 mm (1.8 x 5.28 x 4.13 in)	
Environmental Limits							
Operating Temperature	Standard Temperature	0 to 60°C (32 to 140°F)					
	Wide Temperature	-40 to 75°C (-40 to 167°F)					
Operating Humidity		5 to 95% (non-condensing)					
Storage Temperature		-40 to 75°C (-40 to 167°F)					
Power Requirements							
Input Voltage		12 to 48 VDC					
Input Current		220 mA @ 12 VDC	225 mA @ 12 VDC	250 mA @ 12 VDC	290 mA @ 12 VDC	374 mA @ 12 VDC	512 mA @ 12 VDC
Standards and Certifications							
Safety		UL 508					
EMC		EN 55022/24					
EMI		CISPR 22, FCC Part 15B Class A					
EMS		IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m; Signal: 10 V/m IEC 61000-4-8 PFMF					
Hazardous Location		UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Class I Zone 2, IECEx					
Shock		IEC 60068-2-27					
Freefall		IEC 60068-2-32					
Vibration		IEC 60068-2-6					
Reliability							
Buzzer, RTC, WDT		✓					
MTBF		Time: 262,805 hrs Standard: Telcordia (Bellcore) Standard TR/SR					
Warranty		5 years (see www.moxa.com/warranty)					
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Industrial-Grade Device Servers

	NPort IA5150 NPort IA5150-T	NPort IA5150I NPort IA5150I-T	NPort IA5150-M-SC NPort IA5150-M-SC-T	NPort IA5150I-M-SC NPort IA5150I-M-SC-T	NPort IA5150-S-SC NPort IA5150-S-SC-T	NPort IA5150I-S-SC NPort IA5150I-S-SC-T	NPort IA5250 NPort IA5250-T	NPort IA5250I NPort IA5250I-T
Ethernet Interface								
10/100BaseT(X) Ports	2 (1 IP)	2 (1 IP)	–	–	–	–	2 (1 IP)	2 (1 IP)
100BaseFX Ports	–	–	1 (multi-mode)	1 (multi-mode)	1 (single-mode)	1 (single-mode)	–	–
Connector	RJ45	RJ45	SC	SC	SC	SC	RJ45	RJ45
Magnetic Isolation Protection	1.5 kV	1.5 kV	–	–	–	–	1.5 kV	1.5 kV
Serial Interface								
RS-232/422/485 Ports	1	1	1	1	1	1	2	2
Connector	DB9-M/ Terminal Block	DB9-M/ Terminal Block	DB9-M/ Terminal Block	DB9-M/ Terminal Block	DB9-M/ Terminal Block	DB9-M/ Terminal Block	DB9-M	DB9-M
2 kV Isolation Protection	–	✓	–	✓	–	✓	–	✓
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark							
Flow Control	RTS/CTS, XON/XOFF							
Baudrate	110 bps to 230.4 kbps							
Software								
Network Protocols	ICMP, IPv4, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, SNTP, ARP							
Configuration Options	Web Console, Serial Console, Telnet Console, Windows Utility							
Windows Real COM Drivers	Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded							
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X							
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x, 3.x							
Physical Characteristics								
Housing	Plastic (IP30)							
Weight	360 g (0.79 lb)						380 g (0.84 lb)	
Dimensions	29 x 89.2 x 118.5 mm (0.82 x 3.51 x 4.57 in)							
Environmental Limits								
Operating Temperature – Standard Temperature	0 to 55°C (32 to 131°F)							
Operating Temperature – Wide Temperature	-40 to 75°C (-40 to 167°F)							
Operating Humidity	5 to 95% (non-condensing)							
Storage Temperature	-40 to 75°C (-40 to 167°F)							
Power Requirements								
Input Voltage	12 to 48 VDC							
Input Current	238 mA @ 12 VDC	257 mA @ 12 VDC	315 mA @ 12 VDC	339 mA @ 12 VDC	328 mA @ 12 VDC	333 mA @ 12 VDC	238 mA @ 12 VDC	300 mA max @ 12 VDC
Standards and Certifications								
Safety	UL 508, UL 60950-1							
EMC	EN 55022/24							
EMI	CISPR 22, FCC Part 15B Class A							
EMS	IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power 4 kV; Signal 2 kV IEC 61000-4-5 Surge: Power 2 kV; Signal 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz, 10 V/m; Signal: 10 V/m IEC 61000-4-8 PFMF							
Hazardous Location	UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Class 1 Zone 2, IECEx							
Marine	DNV							
Shock	IEC 60068-2-27							
Freefall	IEC 60068-2-32							
Vibration	IEC 60068-2-6							
Reliability								
Buzzer, RTC, WDT	✓							
MTBF	Time: 183,747 hrs Standard: MIL-HDBK-217F	Time: 195,614 hrs Standard: MIL-HDBK-217F	Time: 183,747 hrs Standard: MIL-HDBK-217F	Time: 195,614 hrs Standard: MIL-HDBK-217F	Time: 183,747 hrs Standard: MIL-HDBK-217F	Time: 195,614 hrs Standard: MIL-HDBK-217F	Time: 194,765 hrs Standard: MIL-HDBK-217F	Time: 341,417 hrs Standard: Telcordia (Bellcore) Standard SR-332
Warranty	5 years (see www.moxa.com/warranty)							
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Wireless Device Servers

		NPort W2150A NPort W2150A-T	NPort W2250A NPort W2250A-T
WLAN Interface			
IEEE 802.11a/g/b/n		✓	
Radio Frequency Type		DSSS/OFDM	
WEP		✓	
WPA, WPA2, 802.11i		✓	
Encryption		128-bit TKIP/AES-CCMP EAP-TLS, PEAP/GTC, PEAP/MD5, PEAP/MSCHAPV2, EAP-TTLS/PAP, EAP-TTLS/CHAP, EAP-TTLS/MSCHAP, EAP-TTLS/MSCHAPV2, EAP-TTLS/EAP-MSCHAPV2, EAP-TTLS/EAP-GTC, EAP-TTLS/EAP-MD5, LEAP	
Max. Transmission Rate		54 Mbps	
Max. Transmission Distance		100 m	
LAN Interface			
Ethernet Ports		1 x 10/100 Mbps (RJ45)	
1.5 kV Magnetic Isolation Protection		✓	
Serial Interface			
Number of Ports		1	2
Serial Standards		RS-232/422/485	
Connector		DB9-M	
Serial Communication Parameters		Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark	
Flow Control		RTS/CTS, XON/XOFF	
Baudrate		50 bps to 921.6 kbps	
Serial Data Log		64 KB	
Software			
Network Protocols		ICMP, IPv4, TCP, UDP, DHCP, Telnet, DNS, SNMP V1/V2c/V3, HTTP, SMTP, SNTP, SSH, HTTPS, ARP	
Configuration Options		Web Console, Serial Console, Telnet Console, Windows Utility	
Management		SNMP MIB-II	
Secure Configuration Options		HTTPS, SSH	
Utilities		NPort Search Utility and NPort Windows Driver Manager	
Windows Real COM Drivers		Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded	
Fixed TTY Drivers		SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X	
Linux Real TTY Drivers		Linux 2.4.x, 2.6.x, 3.x	
Physical Characteristics			
Housing		Aluminum	
Weight		547 g (1.21 lb)	557 g (1.23 lb)
Dimensions		77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)	
Environmental Limits			
Operating Temperature	Standard Temperature	0 to 55°C (32 to 131°F)	
	Wide Temperature	-40 to 75°C (-40 to 167°F)	
Operating Humidity		5 to 95% (non-condensing)	
Storage Temperature		-40 to 75°C (-40 to 167°F)	
Power Requirements			
Input Voltage		12 to 48 VDC	
Input Current		179 mA @ 12 VDC	200 mA @ 12 VDC
Standards and Certifications			
Safety		UL 60950-1	
EMC		EN 55022/24	
EMI		CISPR 22, FCC Part 15B Class A	
EMS		IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11 Dips	
Radio		CE (ETSI EN 301 893, ETSI EN 300 328, ETSI EN 301 489-17, ETSI EN 301 489-1), ARIB RCR STD-33, ARIB STD-66	
Reliability			
MTBF		Time: 383,187 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 363,327 hrs Standard: Telcordia (Bellcore) Standard TR/SR
Warranty		5 years (see www.moxa.com/warranty)	
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ZigBee Device Servers

		NPort Z2150 NPort Z2150-T	NPort Z3150 NPort Z3150-T
ZigBee Interface			
RF Standard		802.15.4	
Frequency Band		2.4 GHz	
RF Data Rate		250 kbps	
Encryption		128-bit AES	
Network Topology		Star, Mesh, Cluster tree	
Transmission Distance		100 m	
Ethernet Interface (NPort Z3150 only)			
Ethernet Ports		–	1 x 10/100 Mbps (RJ45)
1.5 kV Magnetic Isolation Protection		–	✓
Serial Interface			
Number of Ports		1	
Serial Standards		RS-232/422/485	
Connector		DB9-M	
Serial Communication Parameters		Data Bits: 8; Stop Bits: 1, 2; Parity: None, Even, Odd	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 2; Parity: None, Even, Odd, Space, Mark
Flow Control		RTS/CTS	RTS/CTS, XON/XOFF
Baudrate		50 bps to 230.4 kbps	50 bps to 921.6 kbps
Software			
Configuration		ZigBee Configuration Utility	Web Console
Management		–	SNMP v1
Secure Configuration Options		–	HTTPS, SSH
Utilities		ZigBee Configuration Utility	NPort Search Utility and NPort Windows Driver Manager
Windows Real COM Drivers		–	Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/10 x86/x64, Embedded CE 5.0/6.0, XP Embedded, Windows 2012 x64
Fixed TTY Drivers		–	–
Linux Real TTY Drivers		–	–
Physical Characteristics			
Housing		Aluminum	
Weight		340 g (0.75 lb)	780 g (1.72 lb)
Dimensions		52 x 80 x 22 mm (2.05 x 3.15 x 0.87 in)	77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)
Environmental Limits			
Operating Temperature	Standard Temperature	0 to 55°C (32 to 131°F)	
	Wide Temperature	-40 to 75°C (-40 to 167°F)	
Operating Humidity		5 to 95% (non-condensing)	
Storage Temperature		-40 to 75°C (-40 to 167°F)	
Power Requirements			
Input Voltage		12 to 48 VDC	
Input Current		45 mA @ 12 VDC	120 mA @ 12 VDC
Standards and Certifications			
Safety		UL 60950-1	
EMC		EN 55022/24	
EMI		CISPR 22, FCC Part 15B Class A	
EMS		IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 1 kV; Signal: 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11 Dips	
Radio		CE (ETSI EN 301 893, ETSI EN 300 328, ETSI EN 301 489-1-17, ETSI EN 301 489-1)	
Reliability			
MTBF		Time: 2,542,774 hrs Standard: Telcordia (Bellcore) Standard TR/SR	Time: 1,109,589 hrs Standard: Telcordia (Bellcore) Standard TR/SR
Warranty		5 years (see www.moxa.com/warranty)	
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NPort® S8000 Series

Combo switch / serial device servers

NPort S8455I NPort S8455I Fiber NPort S8458

- 4-port RS-232/422/485 serial device server
  - Serial QoS for configuring serial data transmission priority
  - 2 kV (DC) isolation protection for each serial port (S8455I only)
  - Adjustable pull high/low resistor for RS-485 ports (S8455I only)
- Built-in managed Ethernet switch
  - S8455I Fiber: Two fiber Ethernet ports and three Ethernet ports
  - S8455I All Copper: Five Ethernet ports
  - S8458: Four fiber Ethernet ports and four Ethernet ports
- Ethernet redundancy with Turbo Ring and Turbo Chain (recovery time < 20 ms) or RSTP/STP (IEEE 802.1w/D) supported
- QoS, IGMP-snooping/GMRP, VLAN, LACP, SNMPv1/v2c/v3, RMON supported
- Surge protection for serial, power, and Ethernet

Overview

The NPort S8000 series combines an industrial device server with a full-function managed Ethernet switch with 4 RS-232/422/485 serial ports, allowing you to easily install, manage, and maintain the product. Combining a device server and switch in one product allows you to save space in your cabinet, reduce overall power consumption, and reduce costs, since you will not need to purchase a switch and serial device server separately.

Supports the Full Range of NPort 5000 Series Device Server Functions

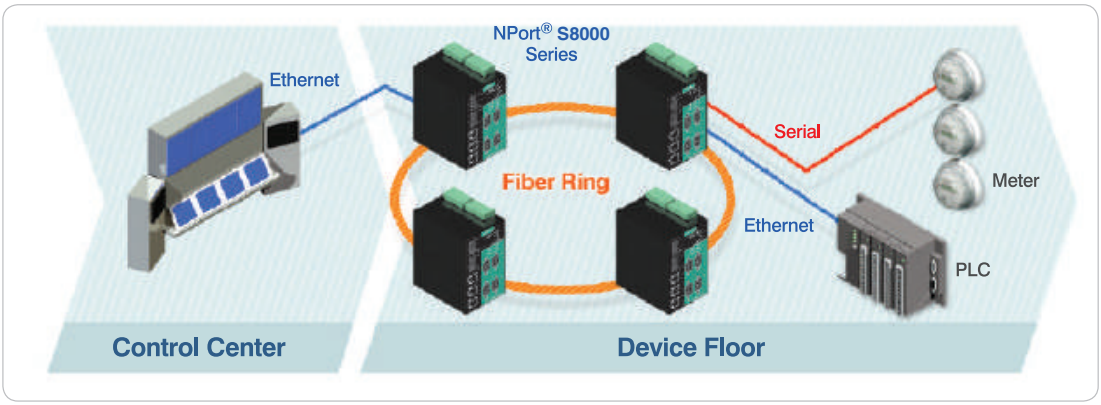
The NPort S8000 series supports the complete array of NPort 5000 series device server functions. You can network your existing serial devices by connecting up to 4 serial devices through Ethernet ports, with only basic configuration required. In addition, data transmission between the serial and Ethernet interfaces is bi-directional.

Full-Function Managed Ethernet Switch

The NPort S8000 series has a built-in full-function managed Ethernet switch that supports QoS, IGMP-snooping/GMRP, VLAN, Port Trunking, SNMPv1/v2c/v3, and IEEE 802.1X, allowing you to handle virtually any kind of application. Ethernet redundancy, which is used to increase the reliability and availability of your industrial Ethernet network, is provided by Moxa's Turbo Ring and Turbo Chain technology (recovery time < 20 ms) or RSTP/STP (IEEE 802.1w/D).

Ring Redundancy at the Device Level

Device-level communication networks for industrial automation are very critical since they are used to control and monitor device processes. The reliability of these communications depends on ring redundancy at the device level. which is designed to provide fast network fault detection and reconfiguration in order to support the most demanding control applications. The NPort S8000 series integrates a full function NPort device server with an industrial switch to carry serial and Ethernet devices at the same time. In addition, the NPort S8000 can also achieve ring redundancy with standard STP/RSTP and Moxa's proprietary Turbo Ring or Turbo Chain 2 redundancy protocols. This all-in-one design can be used to optimize and simplify your device network and enhance reliability.



Rugged Design with Complete Protection

UL 508 Safety

The NPort S8000 series complies with the UL 508 standard, which covers safety requirements for industrial control equipment.

Level 4 ESD (NPort S8458 only)

The NPort S8000 series supports high level, 8/15 kV, ESD protection to prevent damage from static electricity.

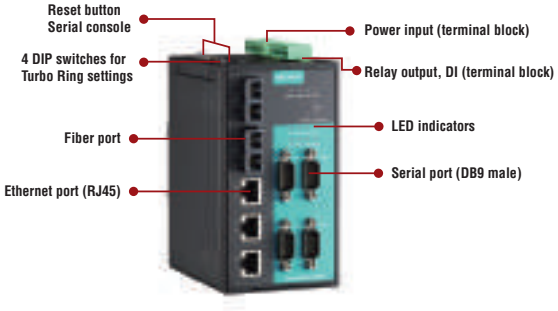
Full Surge Protection (NPort S8458 only)

The NPort S8000 series is equipped with surge protection for power, Ethernet interface, and serial interface to protect against voltage spikes.

2 kV Serial Isolation (NPort S8455I only)

Each serial port is protected by 2 kV of isolation protection to guard against harmful currents.

Appearance



General Specifications

Port Summary

Serial Ports: 4 RS-232/422/485 ports
Ethernet Switch Ports:
NPort S8455I all copper: 5 RJ45 copper ports
NPort S8455I fiber: 3 RJ45 copper ports and 2 fiber ports
NPort S8458: 4 RJ45 copper ports and 4 fiber ports
Console Ports: 1 (8-pin RJ45 connector)

Physical Characteristics

Housing: Metal
Weight:
NPort S8455I: 578 g (1.27 lb)
NPort S8458: 1,105 g (2.44 lb)
Dimensions:
NPort S8455I: 73.1 x 134 x 125 mm (2.88 x 5.27 x 4.92 in)
NPort S8458: 93 x 144 x 125 mm (3.66 x 5.64 x 4.92 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models:
NPort S8455I-T: -40 to 75°C (-40 to 167°F)
NPort S8458-T: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current:
NPort S8455I: 935 mA @ 12 VDC
NPort S8458: 940 mA @ 12 VDC

Standards and Certifications

Safety: UL 508, UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
NPort S8455I:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power 1 kV (4 kV for all copper models); Signal: 0.25 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m; Signal: 10 V/m
IEC 61000-4-8 PFMF
NPort S8458 series:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m; Signal: 10 V/m
IEC 61000-4-8 PFMF
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D (S8455I all copper model only)

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Device Server Specifications

Serial Interface

Number of Ports: 4
Serial Standards: RS-232/422/485
Connector: DB9 male
Serial Line Protection:
2 kV isolation protection (NPort S8455I only)
RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)
Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ
Terminator for RS-485: 120 Ω
Console Port: Dedicated RS-232 console port (8-pin RJ45)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS and XON/XOFF
Baudrate: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Configuration Options: Web Console, Telnet Console, Serial Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X
Linux Real TTY Drivers: Linux 2.4.x, 2.6.x, 3.x
Operation Modes: Real COM, TCP Server, TCP Client, UDP, RFC2217
Management: SNMP MIB-II

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)

Time:
NPort S8455I Single-mode: 286,993 hrs
NPort S8455I Multi-mode: 200, 951 hrs
NPort S8455I All copper: 287,354 hrs
NPort S8458: 163,624 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Ethernet Switch Specifications

Ethernet Interface

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1x for Authentication
IEEE 802.3ad for Port Trunk with LACP
Network Protocols: ICMP, IPv4, TCP, UDP, ARP, Telnet, DNS, HTTP, SMTP, SNTP, IGMPv1/v2, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 82, BootP, TFTP, SNTP, SMTP, RARP, GMRP, LACP, RMON
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control interface

Switch Properties

Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Optical Fiber Interface

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

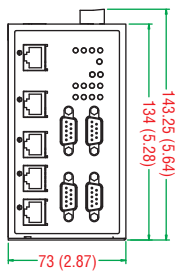
Switch Interface

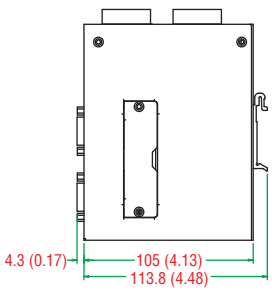
RJ45 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
DIP Switches: Turbo Ring, Master, Coupler, Reserve
Alarm Contact: 2 relay outputs with current carrying capacity of 1A @ 24 VDC

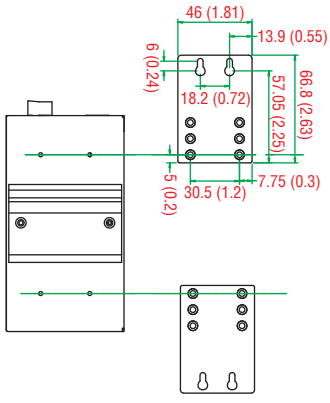
Dimensions

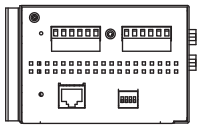
Unit: mm (inch)

NPort S8455I







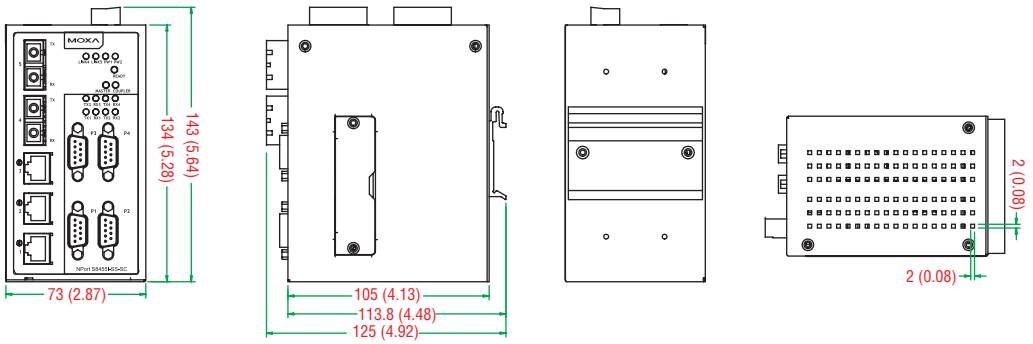


Panel-Mounting Kit

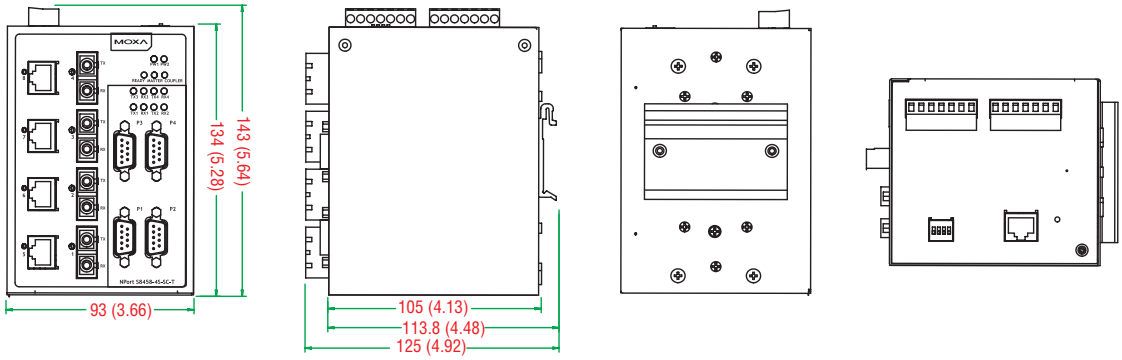
Dimensions

Unit: mm (inch)

NPort S8455I Fiber

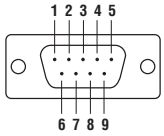


NPort S8458



Pin Assignment

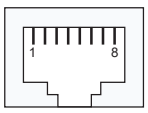
DB9 male connector



Serial Port (DB9 male connector)

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

8-pin RJ45 connector



Console Port (RJ45)

PIN	RS-232
1	DSR
2	RTS
3	GND
4	TxD
5	RxD
6	DCD
7	CTS
8	RTS

Ethernet Port (RJ45)

PIN	Signal
1	RXD+
2	RXD-
3	TXD+
4	–
5	–
6	TXD-
7	
8	

Ordering Information

Available Models

NPort 8455I: 4 RS-232/422/485 ports, 5 10/100M Ethernet ports, 12 to 48 VDC, 2 kV isolation protection, 0 to 60°C operating temperature
NPort S8455I-T: 4 RS-232/422/485 ports, 5 10/100M Ethernet ports, 12 to 48 VDC, 2 kV isolation protection, -40 to 75°C operating temperature
NPort S8455I-MM-SC: 4 RS-232/422/485 ports, 3 10/100M Ethernet ports, 2 100M multi-mode fiber ports with SC connector, 12 to 48 VDC, 2 kV isolation protection, 0 to 60°C operating temperature
NPort S8455I-SS-SC: 4 RS-232/422/485 ports, 3 10/100M Ethernet ports, 2 100M single-mode fiber ports with SC connector, 12 to 48 VDC, 2 kV isolation protection, 0 to 60°C operating temperature
NPort S8455I-MM-SC-T: 4 RS-232/422/485 ports, 3 10/100M Ethernet ports, 2 100M multi-mode fiber ports with SC connector, 12 to 48 VDC, 2 kV isolation protection, -40 to 75°C operating temperature
NPort S8455I-SS-SC-T: 4 RS-232/422/485 ports, 3 10/100M Ethernet ports, 2 100M multi-mode fiber ports with SC connector, 12 to 48 VDC, 2 kV isolation protection, -40 to 75°C operating temperature
NPort S8458-4S-SC-T: 4 RS-232/422/485 ports, 4 10/100M Ethernet ports, 4 100M single-mode fiber ports with SC connector, 12 to 48 VDC, -40 to 85°C operating temperature

Package Checklist

- 1 NPort S8000 device server
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

CBL-PJTB-10: Non-locking barrel plug to bare-wires cable
Mini DB9F-to-TB: DB9 female to terminal block adapter for RS-422/485 applications
MXview: Moxa industrial network management software

NPort® 5000AI-M12 Series

Award-winning Product
TAIWAN EXCELLENCE 2013

Railway 1, 2, and 4-port RS-232/422/485 serial device servers

- Speedy 3-step web-based configuration
- COM port grouping and UDP multicast applications
- Real COM/TTY drivers for Windows and Linux
- Standard TCP/IP interface and versatile TCP and UDP operation modes
- Compliant with EN 50121-4 and essential sections of EN 50155
- M12 connector and IP40 metal housing
- 2 kV isolation for serial signals

EN 50121

Overview

The NPort 5000AI-M12 serial device servers are designed to make serial devices network-ready in an instant, and provides direct access to serial devices from anywhere on the network. Moreover, the NPort 5000AI-M12 is compliant with EN 50121-4 and essential sections of EN 50155, covering operating temperature, power input voltage, surge, ESD, and vibration, making them suitable for rolling stock and wayside applications where high levels of vibration exist in the operating environment.

3-step Web-Based Configuration

The NPort 5000AI-M12's 3-step web-based configuration tool is straightforward and user-friendly. The NPort 5000AI-M12's web console guides users through 3 simple configuration steps that are necessary to activate the serial-to-Ethernet application. With this speedy 3-step web-based configuration, a user only needs to spend an average of 30 seconds to complete the NPort settings and enable the application, saving a great amount of time and effort.

Easy to Troubleshoot

NPort 5000AI-M12 device servers support SNMP, which can be used to monitor all units over Ethernet. Each unit can be configured to send trap messages automatically to the SNMP manager when user-defined errors are encountered. For users who do not use SNMP manager, an e-mail alert can be sent instead. Users can define the trigger for the alerts using Moxa's Windows utility, or the web console. For example, alerts can be triggered by a warm start, a cold start, or a password change.

Specifications

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: M12

Serial Interface

Number of Ports: 1, 2, 4
Serial Standards: RS-232/422/485
Connector: DB9 male
RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS and DTR/DSR (RS-232 only), XON/XOFF
Baudrate: 50 bps to 921.6 kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IPv4, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, IGMP V1/2, ARP, LLDP
Configuration Options: Web Console (with new Quick Setup), Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X
Linux Real TTY Drivers: Linux 2.4.x, 2.6.x, 3.x

Physical Characteristics

Housing: Metal, IP40 protection
Weight: 686 g (1.51 lb)
Dimensions: 80 x 216.6 x 52.9 mm (3.15 x 8.53 x 2.08 in)

Environmental Limits

Operating Temperature:
Standard Models: -25 to 55°C (-13 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Note: Compliant with EN 50155 on 24/48 VDC
Input Current:
NPort 5150AI-M12: 310 mA @ 12 VDC
NPort 5250AI-M12: 360 mA @ 12 VDC
NPort 5450AI-M12: 440 mA @ 12 VDC
Connector: M12

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 0.5 kV; Signal: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m; Signal: 10 V/m
IEC 61000-4-8 PFMF
Rail Traffic: EN 50155 (essential compliance*), EN 50121-4
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
Vibration: IEC 60068-2-6

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)

Time:
NPort 5150AI-M12: 789,341 hrs
NPort 5250AI-M12: 639,622 hrs
NPort 5450AI-M12: 467,777 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

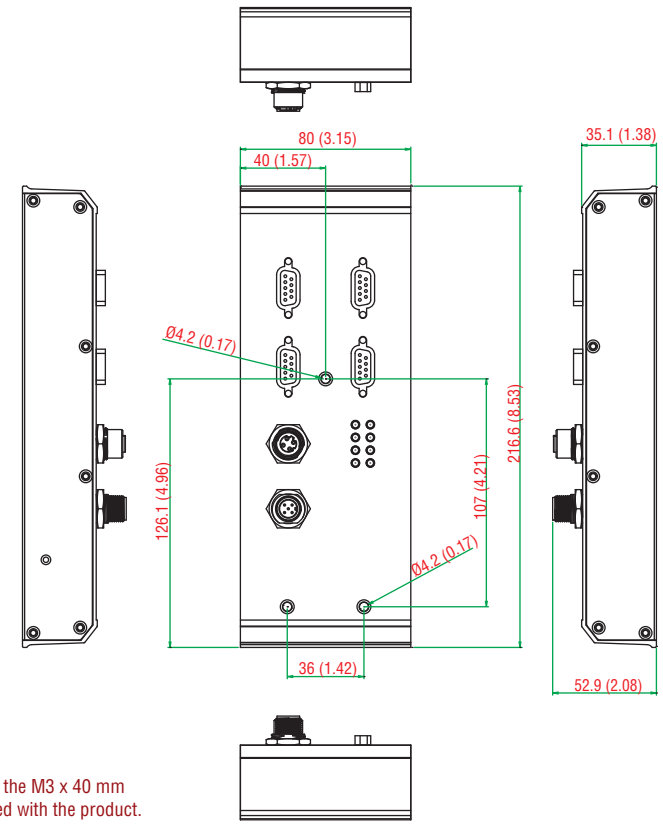
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

All models of the NPort 5000AI-M12 series (NPort 5150AI-M12, NPort 5250AI-M12, and NPort 5450AI-M12) have the same dimensions.

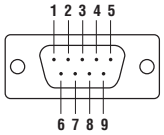
Unit: mm (inch)



Be sure to use the M3 x 40 mm screws included with the product.

Pin Assignment

DB9 male connector

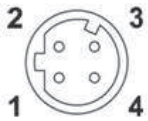


PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

Power input

PIN	Description
1	Input V+
2	Not assigned
3	Input V-
4	Not assigned
5	Function ground

Ethernet port



PIN	Description
1	TD+
2	RD+
3	TD-
4	RD-

Ordering Information

Available Models

NPort 5150AI-M12: 1-port RS-232/422/485 device server with M12 connector, M12 power input, -25 to 55°C operating temperature
NPort 5150AI-M12-CT: 1-port RS-232/422/485 device server with M12 connector, M12 power input, -25 to 55°C operating temperature, conformal coating
NPort 5150AI-M12-T: 1-port RS-232/422/485 device server, 1 10/100BaseT(X)port with M12 connector, M12 power input, -40 to 75°C operating temperature
NPort 5150AI-M12-CT-T: 1-port RS-232/422/485 device server with M12 connector, M12 power input, conformal coating, -40 to 75°C operating temperature
NPort 5250AI-M12: 2-port RS-232/422/485 device server, 1 10/100BaseT(X)port with M12 connector, M12 power input, -25 to 55°C operating temperature
NPort 5250AI-M12-CT: 2-port RS-232/422/485 device server, 1 10/100BaseT(X)port with M12 connector, M12 power input, -25 to 55°C operating temperature, conformal coating
NPort 5250AI-M12-T: 2-port RS-232/422/485 device server, 1 10/100BaseT(X)port with M12 connector, M12 power input, -40 to 75°C operating temperature
NPort 5250AI-M12-CT-T: 2-port RS-232/422/485 device server with M12 connector, M12 power input, conformal coating, -40 to 75°C operating temperature
NPort 5450AI-M12: 4-port RS-232/422/485 device server, 1 10/100BaseT(X)port with M12 connector, M12 power input, -25 to 55°C operating temperature
NPort 5450AI-M12-CT: 4-port RS-232/422/485 device server, 1 10/100BaseT(X)port with M12 connector, M12 power input, -25 to 55°C operating temperature, conformal coating
NPort 5450AI-M12-T: 4-port RS-232/422/485 device server, 1 10/100BaseT(X)port with M12 connector, M12 power input, -40 to 75°C operating temperature
NPort 5450AI-M12-CT-T: 4-port RS-232/422/485 device server with M12 connector, M12 power input, conformal coating, -40 to 75°C operating temperature

Package Checklist

- 1 NPort 5000AI-M12 device server
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

Mini DB9F-to-TB: DB9 female to terminal block adapter for RS-422/485 applications
MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
DR-75-48/DR-120-48: 75/120 W DIN-rail 48 VDC power supplies

NPort® 5100A Series

1-port RS-232/422/485 serial device servers

- Only 1 W power consumption
- Speedy 3-step web-based configuration
- Surge protection for serial, Ethernet, and power lines
- COM port grouping and UDP multicast applications
- Screw connectors for secure installation
- Real COM/TTY drivers for Windows and Linux
- Standard TCP/IP interface and versatile TCP and UDP operation modes
- Connect up to 8 TCP hosts

Overview

The NPort® 5100A device servers are designed to make serial devices network-ready in an instant and give your PC software direct access to serial devices from anywhere on the network. The NPort® 5100A device servers are ultra-lean, ruggedized, and user-friendly, making simple and reliable serial-to-Ethernet solutions possible.

A Greener Serial-to-Ethernet Solution

The Moxa MiiNe is a small but powerful ARM-based serial-to-Ethernet SoC with RAM and Flash embedded. With the MiiNe inside, the NPort® 5110A series becomes the world's only device server with power consumption less than 1 W. The NPort® 5100A series saves at least 50% on power consumption compared to existing solutions on the market, helping engineers meet the tough environmental compliance challenges found in today's industrial environments.

Surge-Protected Serial, Ethernet, and Power Lines

Surge, which is typically caused by high voltages that result from switching and lightning transients, is a common threat to all electrical devices. Moxa's leading-edge surge immunity solution, which is applied to the NPort® 5100A's serial, power, and Ethernet lines, is tested and proven compliant with IEC 61000-4-5. This state-of-the-art surge protection provides a robust serial-to-Ethernet solution that can protect electrical devices from voltage spikes and withstand electrically noisy environmental conditions.

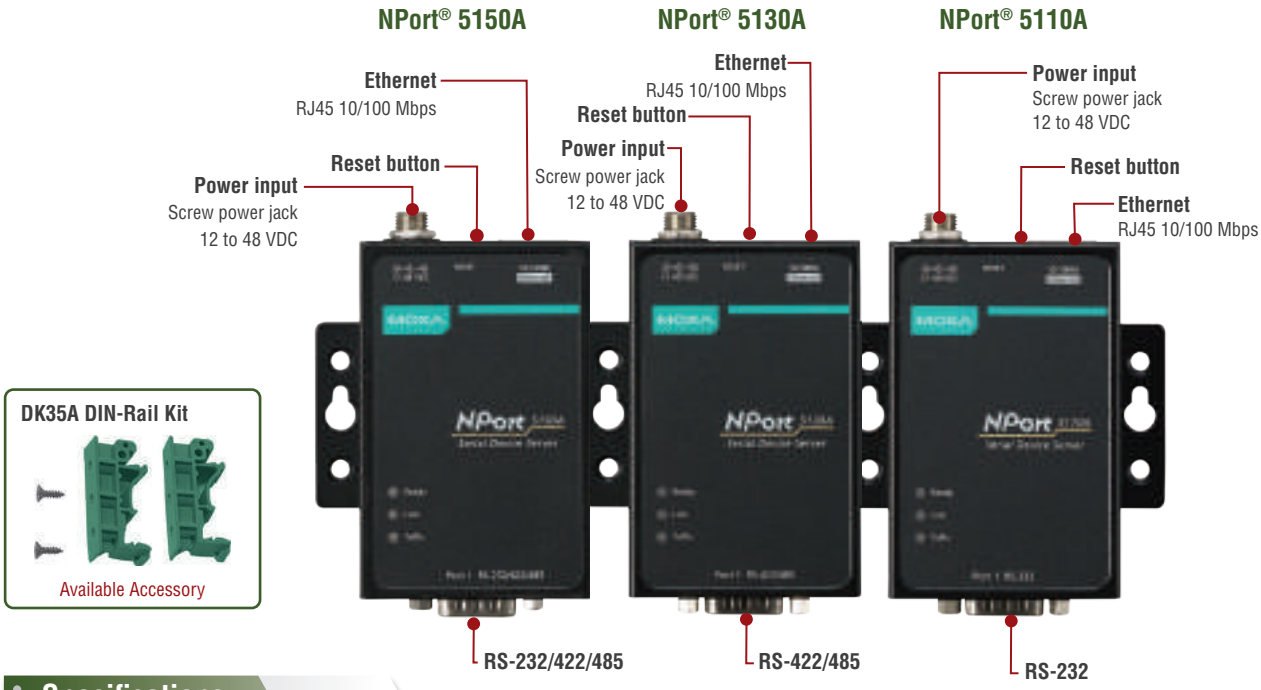
3-step Web-Based Configuration

The NPort® 5100A's 3-step web-based configuration tool is straightforward and user-friendly. The NPort® 5100A's web console guides users through 3 simple configuration steps that are necessary to activate the serial-to-Ethernet application. With this speedy 3-step web-based configuration, a user only needs to spend an average of 30 seconds to complete the NPort® settings and enable the application, saving a great amount of time and effort.

Easy to Troubleshoot

NPort® 5100A device servers support SNMP, which can be used to monitor all units over Ethernet. Each unit can be configured to send trap messages automatically to the SNMP manager when user-defined errors are encountered. For users who do not use SNMP manager, an e-mail alert can be sent instead. Users can define the trigger for the alerts using Moxa's Windows utility, or the web console. For example, alerts can be triggered by a warm start, a cold start, or a password change.

Appearance



DK35A DIN-Rail Kit

Available Accessory

Specifications

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface

Number of Ports: 1
Serial Standards:
NPort 5110A: RS-232
NPort 5130A: RS-422/485
NPort 5150A: RS-232/422/485
Connector: DB9 male
Serial Line Protection: Level 1 surge, EN 61000-4-5
RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)
Pull High/Low Resistor for RS-485: 1 kΩ, 150 kΩ

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS and DTR/DSR (RS-232 only), XON/XOFF
Baudrate: 50 bps to 921.6 kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IPv4, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, IGMP V1/2, ARP
Configuration Options: Web Console (with new Quick Setup), Serial Console (NPort 5110A/5150A only), Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X
Linux Real TTY Drivers: Linux 2.4.x, 2.6.x, 3.x

Physical Characteristics

Housing: Metal
Weight: 340 g (0.75 lb)
Dimensions:
Without ears: 52 x 80 x 22 mm (2.05 x 3.15 x 0.87 in)
With ears: 75.2 x 80 x 22 mm (2.96 x 3.15 x 0.87 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current:
NPort 5110A: 82.5 mA @ 12 VDC
NPort 5130A: 89.1 mA @ 12 VDC
NPort 5150A: 92.4 mA @ 12 VDC

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 0.5 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m; Signal: 10 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11 DIPs

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

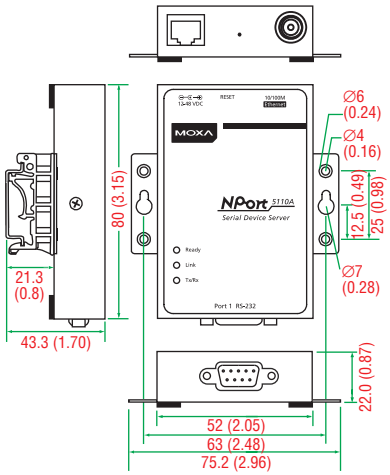
MTBF (mean time between failures)
Time: 2,231,530 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

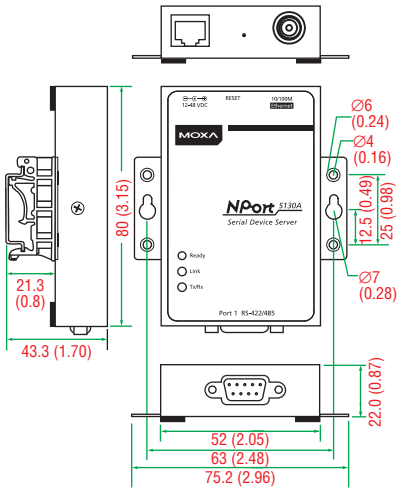
Dimensions

Unit: mm (inch)

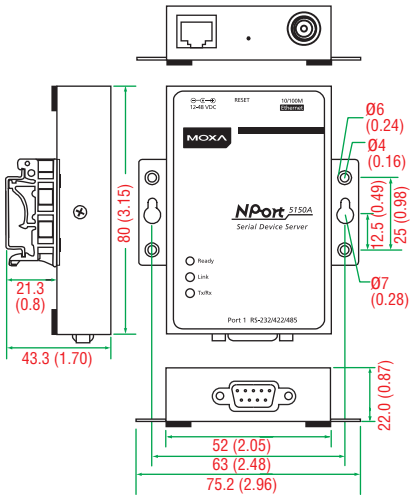
NPort® 5110A



NPort® 5130A

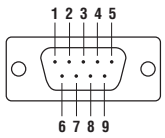


NPort® 5150A



Pin Assignment

DB9 male connector



NPort® 5110A (RS-232)

PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

NPort® 5130A (RS-422/485)

PIN	RS-422/485-4w	RS-485-2w
1	TxD-(A)	–
2	TxD+(B)	–
3	RxD+(B)	Data+(B)
4	RxD-(A)	Data-(A)
5	GND	GND
6	–	–
7	–	–
8	–	–

NPort® 5150A (RS-232/422/485)

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

Ordering Information

Available Models

NPort 5110A: 1-port RS-232 device server, 0 to 60°C operating temperature
NPort 5130A: 1-port RS-422/485 device server, 0 to 60°C operating temperature
NPort 5150A: 1-port RS-232/422/485 device server, 0 to 60°C operating temperature
NPort 5110A-T: 1-port RS-232 device server, -40 to 75°C operating temperature
NPort 5130A-T: 1-port RS-422/485 device server, -40 to 75°C operating temperature
NPort 5150A-T: 1-port RS-232/422/485 device server, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DK35A: DIN-rail mounting clips, 35 mm, 2 DIN-rail plates with 4 screws
CBL-PJ21NOPEN-BK-30: Locking barrel plug to bare-wires cable
Mini DB9F-to-TB: DB9 female to terminal block adapter for RS-422/485 applications
Note: One power adapter suitable for your region is included in the product package. Additional power adapters can be purchased separately. Please refer to the Power Accessory Selection Guide for details.

Package Checklist

- 1 NPort 5100A device server
- 100 to 240 VAC power adapter (excluding T models)*
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

*The package includes one power adapter suitable for your region.

NPort® P5150A Series

1-port RS-232/422/485 PoE serial device servers

- IEEE 802.3af-compliant PoE PD equipment
- Speedy 3-step web-based configuration
- Surge protection for serial, Ethernet, and power lines
- COM port grouping and UDP multicast applications
- Screw connectors for secure installation
- Real COM/TTY drivers for Windows and Linux
- Standard TCP/IP interface and versatile TCP and UDP operation modes

PoE Power over Ethernet

Overview

NPort® P5150A device servers are designed to make serial devices network-ready in an instant. It is a PD device and is IEEE 802.3af compliant, so it can by powered by a PoE PSE device without an additional power supply. Use the NPort® P5150A device servers to give your PC software direct access to serial devices from anywhere on the network. The NPort® P5150A device servers are ultra-lean, ruggedized, and user-friendly, making simple and reliable serial-to-Ethernet solutions possible.

Surge-Protected Serial, Ethernet, and Power Lines

Surge, which is typically caused by high voltages that result from switching and lightning transients, is a common threat to all electrical devices. Moxa's leading-edge surge immunity solution, which is applied to the NPort® P5150A's serial, power, and Ethernet lines, is tested and proven compliant with IEC 61000-4-5. This state-of-the-art surge protection provides a robust serial-to-Ethernet solution that can protect electrical devices from voltage spikes and withstand electrically noisy environmental conditions.

3-step Web-Based Configuration

The NPort® P5150A's 3-step web-based configuration tool is straightforward and user-friendly. The NPort® P5150A's web console guides users through 3 simple configuration steps that are necessary to activate the serial-to-Ethernet application. With this speedy 3-step web-based configuration, a user only needs to spend an average of 30 seconds to complete the NPort® settings and enable the application, saving a great amount of time and effort.

Easy to Troubleshoot

NPort® P5150A device servers support SNMP, which can be used to monitor all units over Ethernet. Each unit can be configured to send trap messages automatically to the SNMP manager when user-defined errors are encountered. For users who do not use SNMP manager, an e-mail alert can be sent instead. Users can define the trigger for the alerts using Moxa's Windows utility, or the web console. For example, alerts can be triggered by a warm start, a cold start, or a password change.

Appearance

NPort® P5150A

DK35A DIN-Rail Kit

Available Accessory

Specifications

Ethernet Interface
Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface
Number of Ports: 1
Serial Standards: RS-232/422/485
Connector: DB9 male
Serial Line Protection: Level 2 Surge, EN61000-4-5
RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)
Pull High/Low Resistor for RS-485: 1 kΩ, 150 kΩ

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS and DTR/DSR (RS-232 only), XON/XOFF
Baudrate: 50 bps to 921.6 kbps

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software
Network Protocols: ICMP, IPv4, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, IGMP V1/2, ARP
Configuration Options: Web Console (with new Quick Setup), Serial Console, Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X
Linux Real TTY Drivers: Linux 2.4.x, 2.6.x, 3.x

Physical Characteristics
Housing: Metal
Weight: 300 g (0.66 lb)
Dimensions:
Without ears: 77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)
With ears: 100 x 111 x 26 mm (3.94 x 4.37 x 1.02 in)

Environmental Limits
Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements
Input Voltage: 12 to 48 VDC (supplied by power adapter) or 48 VDC (supplied by PoE)
Input Current:
DC Jack I/P: 125 mA @ 12 VDC
PoE I/P: 180 mA @ 48 VDC

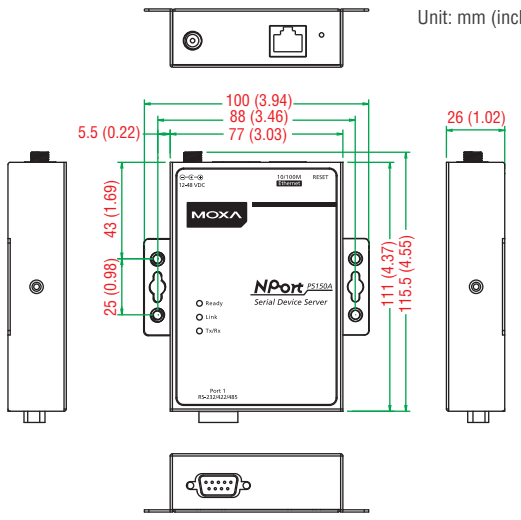
Standards and Certifications
Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11 DIPs

Reliability
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

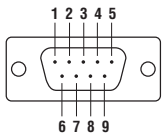
MTBF (mean time between failures)
Time: 2,231,530 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions
Unit: mm (inch)



Pin Assignment
DB9 male connector



NPort® P5150A (RS-232/422/485)

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

Ordering Information

Available Models
NPort P5150A: 1-port RS-232/422/485 PoE device server, 0 to 60°C operating temperature
NPort P5150A-T: 1-port RS-232/422/485 PoE device server, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)
DK35A: DIN-rail mounting clips, 35 mm, 2 DIN-rail plates with 4 screws
Mini DB9F-to-TB: DB9 female to terminal block adapter for RS-422/485 applications
Note: Additional power adapters can be purchased separately. Please refer to the Power Accessory Selection Guide for details.

Package Checklist
- 1 NPort P5150A device server
- 4 stick-on pads
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

NPort® 5200A Series

2-port RS-232/422/485 serial device servers

- Speedy 3-step web-based configuration
- Surge protection for serial, Ethernet, and power lines
- COM port grouping and UDP multicast applications
- Screw connectors for secure installation
- Dual DC power inputs with power jack and terminal block
- Versatile TCP and UDP operation modes

Overview

The NPort® 5200A device servers are designed to make serial devices network-ready in an instant and give your PC software direct access to serial devices from anywhere on the network. The NPort® 5200A device servers are ultra-lean, ruggedized, and user-friendly, making simple and reliable serial-to-Ethernet solutions possible.

A Greener Serial-to-Ethernet Solution

The Moxa MiiNe is a small but powerful ARM-based serial-to-Ethernet SoC with RAM and Flash embedded. The NPort® 5200A series saves at least 50% on power consumption compared to existing solutions on the market, helping engineers meet the tough environmental compliance challenges found in today's industrial environments.

Surge-Protected Serial, Ethernet, and Power Lines

Surge, which is typically caused by high voltages that result from switching and lightning transients, is a common threat to all electrical devices. Moxa's leading-edge surge immunity solution, which is applied to the NPort® 5200A's serial, power, and Ethernet lines, is tested and proven compliant with IEC 61000-4-5. This state-of-the-art surge protection provides a robust serial-to-Ethernet solution that can protect electrical devices from voltage spikes and withstand electrically noisy environmental conditions.

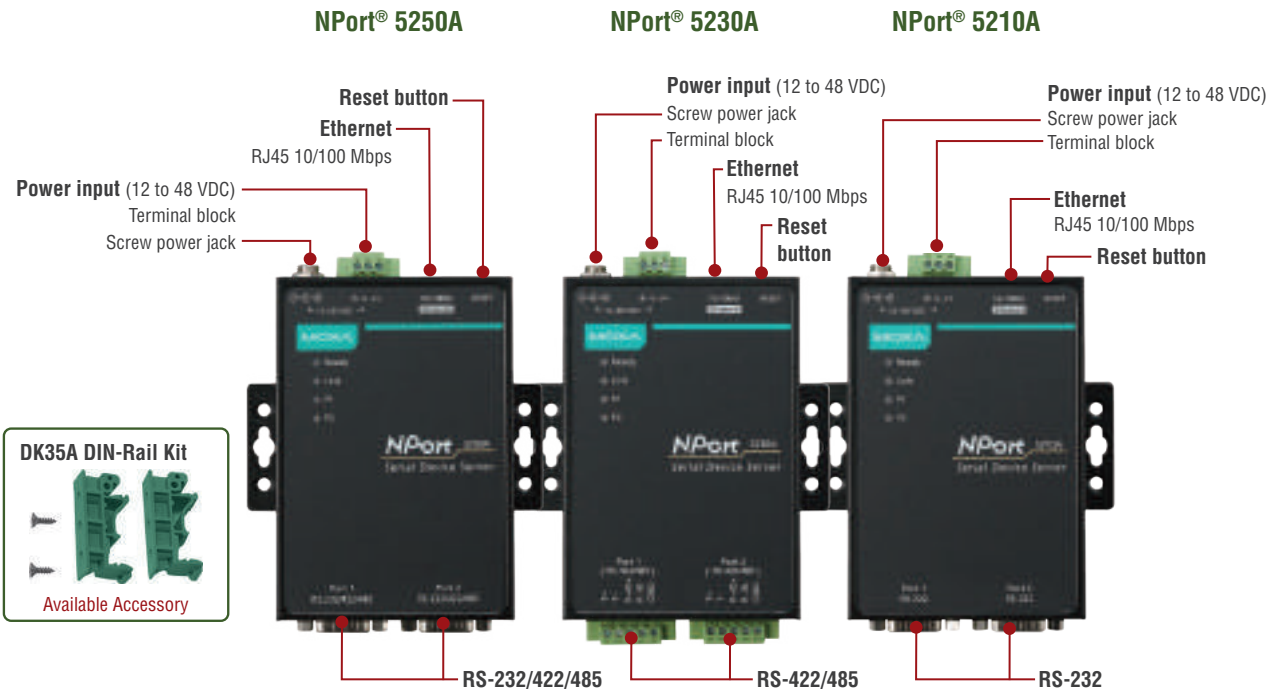
3-step Web-Based Configuration

The NPort® 5200A's 3-step web-based configuration tool is straightforward and user-friendly. The NPort® 5200A's web console guides users through 3 simple configuration steps that are necessary to activate the serial-to-Ethernet application. With this speedy 3-step web-based configuration, a user only needs to spend an average of 30 seconds to complete the NPort® settings and enable the application, saving a great amount of time and effort.

COM Port Grouping

The NPort® 5200A's COM Grouping function allows you to create a COM Group and redirect data from it to several physical COM ports on NPort device servers. With COM Grouping, you will be able to control multiple physical serial ports simultaneously by operating only one COM port.

Appearance



Specifications

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 kV built-in
Ethernet Line Protection: EN 61000-4-5 (Surge) Level 2

Serial Interface

Number of Ports: 2
Serial Standards:
NPort 5210A: RS-232
NPort 5230A: RS-422/485
NPort 5250A: RS-232/422/485
Connector:
NPort 5210A/5250A: DB9 male
NPort 5230A: Terminal Block (5 pins per port)
Serial Line Protection: EN 61000-4-5 (Surge) Level 1
RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)
Pull High/Low Resistor for RS-485: 1 kΩ, 150 kΩ

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS and DTR/DSR (RS-232 only), XON/XOFF
Baudrate: 50 bps to 921.6 kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IPv4, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, IGMP V1/2, ARP
Configuration Options: Web Console (with new Quick Setup), Serial Console (NPort 5210A/5250A only), Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X
Linux Real TTY Drivers: Linux 2.4.x, 2.6.x, 3.x

Physical Characteristics

Housing: Metal
Weight: 340 g (0.75 lb)
Dimensions:
Without ears: 77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)
With ears: 100 x 111 x 26 mm (3.94 x 4.37 x 1.02 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current: 119 mA @ 12 VDC

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m; Signal: 10 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11 DIPs

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)

Time: 847,750 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

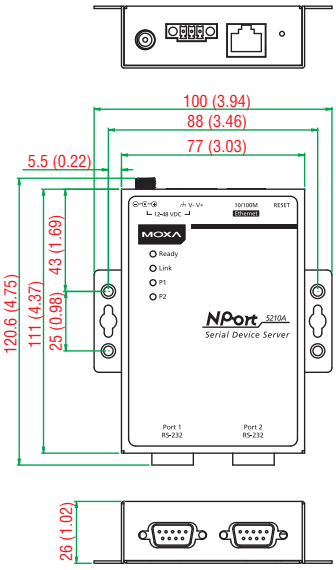
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

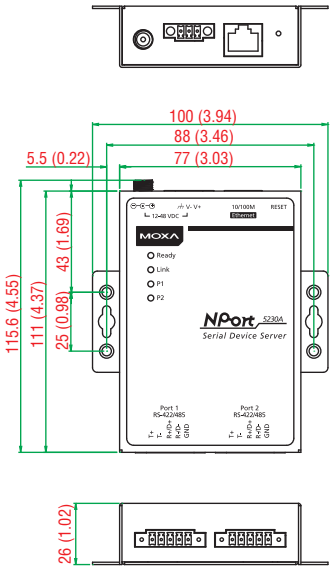
Dimensions

Unit: mm (inch)

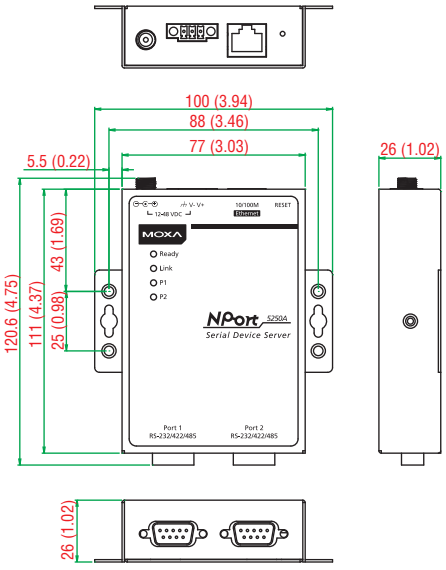
NPort® 5210A



NPort® 5230A



NPort® 5250A

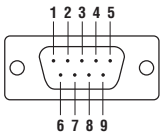


Pin Assignment

NPort® 5250A (RS-232/422/485)

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

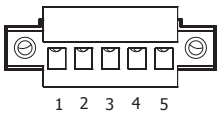
DB9 male connector



NPort® 5230A (RS-422/485)

PIN	RS-422/485-4w	RS-485-2w
1	TxD+(B)	–
2	TxD-(A)	–
3	RxD+(B)	Data+(B)
4	RxD-(A)	Data-(A)
5	GND	GND

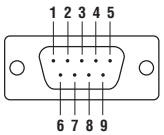
5-contact terminal block



NPort® 5210A (RS-232)

PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

DB9 male connector



Ordering Information

Available Models

NPort 5210A: 2-port RS-232 device server, 0 to 60°C operating temperature
NPort 5230A: 2-port RS-422/485 device server, 0 to 60°C operating temperature
NPort 5250A: 2-port RS-232/422/485 device server, 0 to 60°C operating temperature
NPort 5210A-T: 2-port RS-232 device server, -40 to 75°C operating temperature
NPort 5230A-T: 2-port RS-422/485 device server, -40 to 75°C operating temperature
NPort 5250A-T: 2-port RS-232/422/485 device server, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DK35A: DIN-rail mounting clips, 35 mm, 2 DIN-rail plates with 4 screws
Mini DB9F-to-TB: DB9 female to terminal block adapter for RS-422/485 applications

Note: One power adapter suitable for your region is included in the product package. Additional power adapters can be purchased separately. Please refer to the Power Accessory Selection Guide for details.

Package Checklist

- 1 NPort 5200A device server
- 100 to 240 VAC power adapter (excluding T models)*
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

*The package includes one power adapter suitable for your region.

NPort® 5100 Series

1-port RS-232/422/485 serial device servers

- Small size for easy installation
- Real COM/TTY drivers for Windows and Linux
- Standard TCP/IP interface and versatile operation modes
- Easy-to-use Windows utility for configuring multiple device servers
- SNMP MIB-II for network management
- Configure by Telnet, web browser, or Windows utility
- Adjustable pull high/low resistor for RS-485 ports

Specifications

Ethernet Interface
Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface
Number of Ports: 1
Serial Standards:
NPort 5110: RS-232
NPort 5130: RS-422/485
NPort 5150: RS-232/422/485
Connector: DB9 male
RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)
Pull High/Low Resistor for RS-485: 1 kΩ, 150 kΩ

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS and DTR/DSR (RS-232 only), XON/XOFF
Baudrate:
NPort 5110: 110 bps to 230.4 kbps
NPort 5130/5150: 50 bps to 921.6 kbps

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software
Network Protocols: ICMP, IPv4, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, ARP, HTTP, SMTP
Configuration Options: Web Console, Serial Console (NPort 5110/5150 only), Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X
Linux Real TTY Drivers: Linux 2.4.x, 2.6.x, 3.x

Physical Characteristics
Housing: Metal
Weight: 340 g (0.75 lb)
Dimensions:
Without ears: 52 x 80 x 22 mm (2.05 x 3.15 x 0.87 in)
With ears: 75.2 x 80 x 22 mm (2.96 x 3.15 x 0.87 in)

Environmental Limits
Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements
Input Voltage: 12 to 48 VDC
Input Current:
NPort 5110: 128.7 mA @ 12 VDC
NPort 5130/5150: 200 mA @ 12 VDC

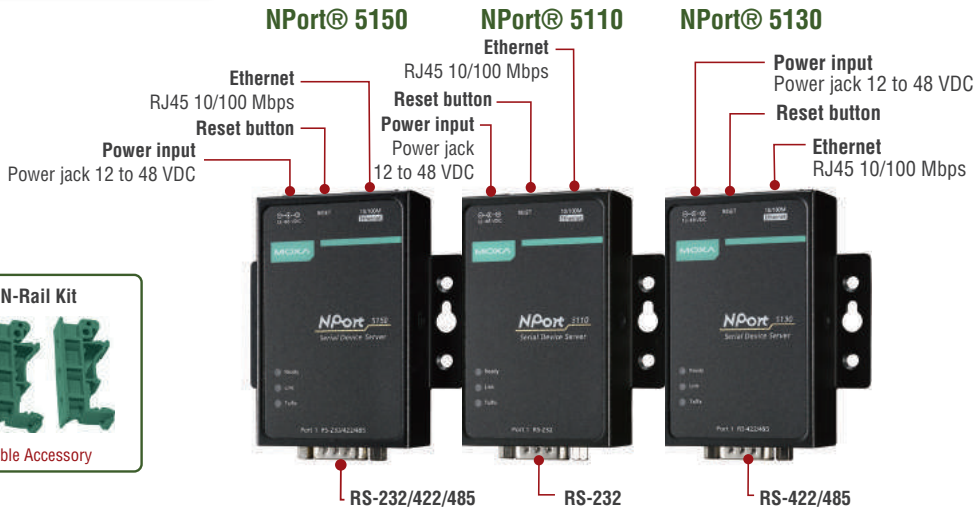
Standards and Certifications
Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 1 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11 DIPs

Reliability
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)
Time:
NPort 5110: 3,126,448 hrs
NPort 5130: 2,836,863 hrs
NPort 5150: 2,736,202 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Appearance

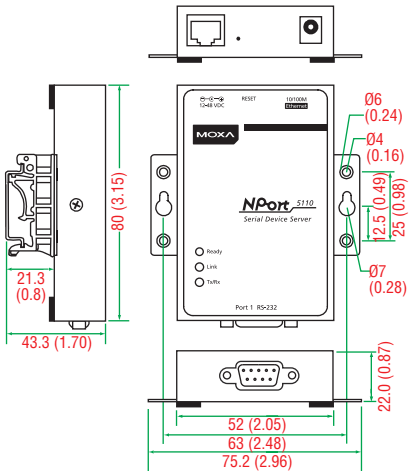


DK35A DIN-Rail Kit

Available Accessory

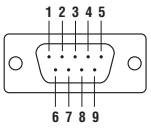
Dimensions

Unit: mm (inch)



Pin Assignment

DB9 male connector



PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

Ordering Information

Available Models

NPort 5110: 1-port RS-232 device server, 0 to 55°C operating temperature
NPort 5130: 1-port RS-422/485 device server, 0 to 55°C operating temperature
NPort 5150: 1-port RS-232/422/485 device server, 0 to 55°C operating temperature
NPort 5110-T: 1-port RS-232 device server, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DK35A: DIN-rail mounting clips, 35 mm, 2 DIN-rail plates with 4 screws
Mini DB9F-to-TB: DB9 female to terminal block adapter for RS-422/485 applications
Note: One power cord suitable for your region is included in the product package. Additional power cords can be purchased separately. Please refer to the Power Accessory Selection Guide for details.

Package Checklist

- 1 NPort 5100 device server
- 100 to 240 VAC standard operating temp. power adapter (excluding T models)*
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

*The package includes one power adapter suitable for your region.

NPort® 5200 Series

2-port RS-232/422/485 serial device servers

- Compact design for easy installation
- Socket modes: TCP server/TCP client/UDP
- Easy-to-use Windows utility for configuring multiple device servers
- Supports 10/100M Ethernet
- Patented ADDC® (Automatic Data Direction Control) for 2-wire and 4-wire RS-485
- SNMP MIB-II for network management

Specifications

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface

Number of Ports: 2
Serial Standards:
NPort 5210: RS-232
NPort 5230: 1 RS-232 port, 1 RS-422/485 port
NPort 5232/5232I: RS-422/485
Connector:
NPort 5210: RJ45 (8 pins)
NPort 5230/5232/5232I: Terminal Block (5 contacts per port)
Serial Line Protection: 2 kV isolation protection (NPort 5232I/5232I-T)
RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS (RS-232 only), DTR/DSR (NPort 5210 only), XON/XOFF
Baudrate: 110 bps to 230.4 kbps

Serial Signals

RS-232:
NPort 5210: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
NPort 5230: TxD, RxD, RTS, CTS, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IPv4, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, SNTP, ARP
Configuration Options: Web Console, Serial Console (NPort 5210/5230 only), Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X
Linux Real TTY Drivers: Linux 2.4.x, 2.6.x, 3.x

Physical Characteristics

Housing: Metal
Weight:
NPort 5210: 340 g (0.75 lb)
NPort 5230/5232: 360 g (0.79 lb)
NPort 5232I: 380 g (0.84 lb)
Dimensions:
NPort 5210/5230/5232:
Without ears: 67 x 100.4 x 22 mm (2.64 x 3.95 x 0.87 in)
With ears: 90 x 100.4 x 22 mm (3.54 x 3.95 x 0.87 in)
NPort 5232I:
Without ears: 67 x 100.4 x 35 mm (2.64 x 3.95 x 1.37 in)
With ears: 90 x 100.4 x 35 mm (3.54 x 3.95 x 1.37 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current:
NPort 5210: 325 mA @ 12 VDC
NPort 5230: 325 mA @ 12 VDC
NPort 5232: 280 mA @ 12 VDC
NPort 5232I: 365 mA @ 12 VDC

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 1 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11 DIPs
Marine: DNV (excluding the NPort 5210)
Medical: (NPort 5210 only) EN 60601-1-2 Class B, EN55011

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

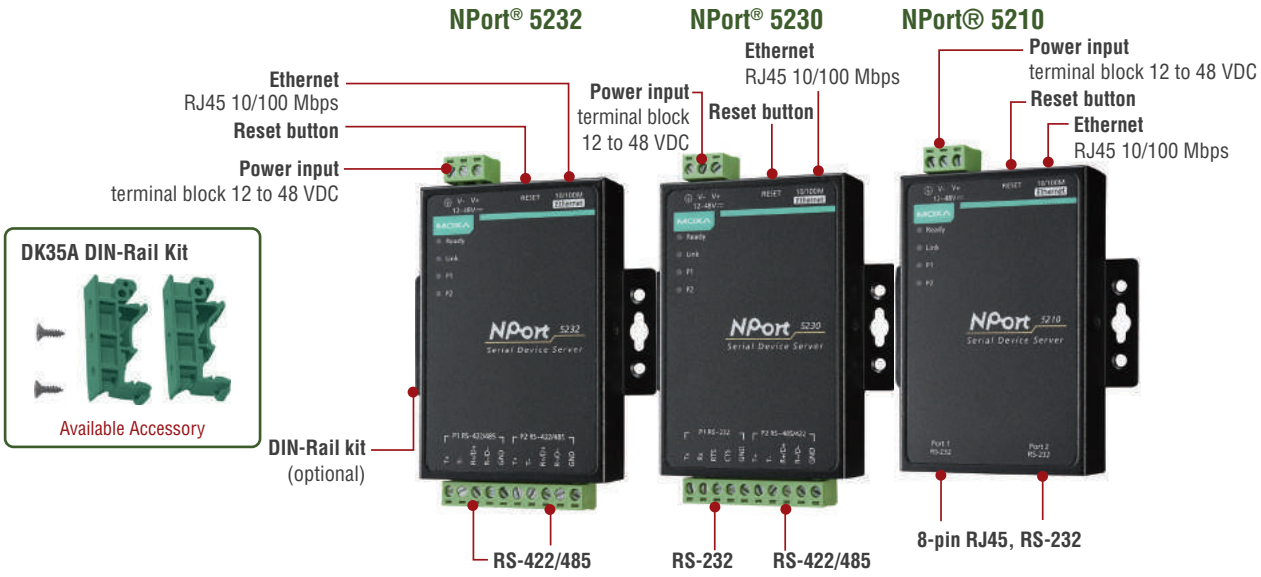
MTBF (mean time between failures)

Time:
NPort 5210: 381,342 hrs
NPort 5230: 377,937 hrs
NPort 5232/5232I: 309,383 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

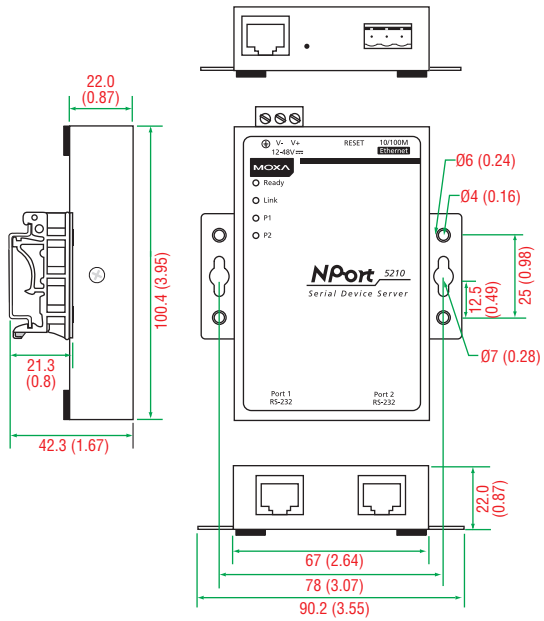
Appearance



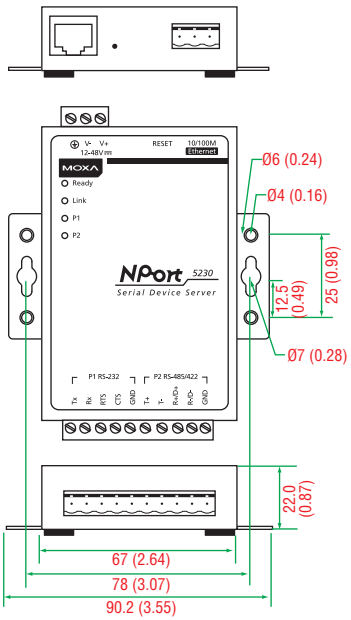
Dimensions

Unit: mm (inch)

NPort® 5210



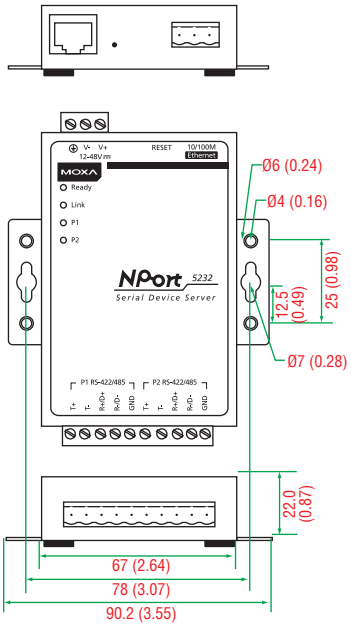
NPort® 5230



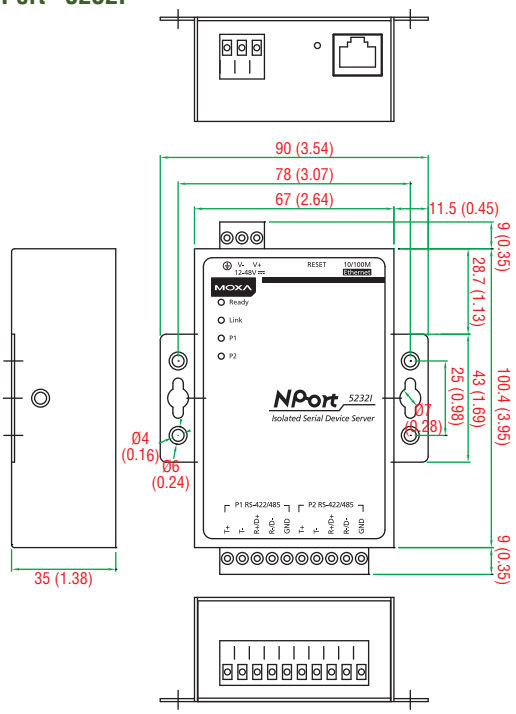
Dimensions

Unit: mm (inch)

NPort® 5232

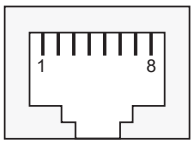


NPort® 5232I



Pin Assignment

8-pin RJ45 connector



NPort® 5210/5210-T (RS-232)

PIN	RS-232
1	DSR (in)
2	RTS (out)
3	GND
4	TxD (out)
5	RxD (in)
6	DCD (in)
7	CTS (in)
8	DTR (out)

Ordering Information

Available Models

NPort 5210: 2-port RS-232 device server, 0 to 55°C operating temperature
NPort 5230: 2-port device server with 1 RS-232 port and 1 RS-422/485 port, 0 to 55°C operating temperature
NPort 5232: 2-port RS-422/485 device server, 0 to 55°C operating temperature
NPort 5232I: 2-port RS-422/485 device server with 2 kV optical isolation, 0 to 55°C operating temperature
NPort 5210-T: 2-port RS-232 device server, -40 to 75°C operating temperature
NPort 5230-T: 2-port device server with 1 RS-232 port and 1 RS-422/485 port, -40 to 75°C operating temperature
NPort 5232-T: 2-port RS-422/485 device server, -40 to 75°C operating temperature
NPort 5232I-T: 2-port RS-422/485 device server with 2 kV optical isolation, -40 to 75°C operating temperature

Package Checklist

- 1 NPort 5200 device server
- 1 power wiring adapter: CBL-PJTB-10
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

DK35A: DIN-rail mounting clips, 35 mm, 2 DIN-rail plates with 4 screws
CBL-PJTB-10: Non-locking barrel plug to bare wires cable
Mini DB9F-to-TB: DB9 female to terminal block adapter for RS-422/485 applications
Note: Additional power adapters can be purchased separately. Please refer to the Power Accessory Selection Guide for details.

NPort® 5400 Series

4-port RS-232/422/485 serial device servers

- 10/100M auto-sensing Ethernet
- 4 serial ports supporting RS-232/422/485
- Socket modes: TCP server/TCP client/UDP/Real COM
- Configure via Telnet/Web/Windows utility
- SNMP MIB-II for network management
- 2 kV isolation protection for NPort 5430I/5450I/5450I-T
- -40 to 75°C operating temperature range (T model)

Network-Readiness for up to Four Serial Devices

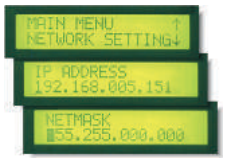
NPort® 5400 device servers can conveniently and transparently connect up to four serial devices to an Ethernet network, allowing you to network your existing serial devices with only basic configuration. Data transmission between the serial and Ethernet interfaces is bi-directional. By using NPort® device servers, you not only protect your current hardware investment, but also allow for future network expansion. You can both centralize the management of your serial devices and distribute management hosts over the network.

Independent Operation Mode for Each Serial Port

NPort® 5400 device servers can be used to connect different devices for remote data polling or event handling over a TCP/IP network. Each serial port on the NPort® 5400 operates independently to provide maximum versatility. For example, port 1 can operate in Driver mode, port 2 in TCP Server mode, and ports 3 and 4 in TCP Client mode.

User-friendly LCD Panel for Easy Installation

An LCD panel is built into the NPort® 5400's top panel, with four buttons for data input, configuration, and operation mode selection. The LCD panel displays the server name, serial number, and IP address, and it can be used to enter or modify parameters such as IP address, netmask, and gateway. (The LCD panel is not available on wide temperature models.)



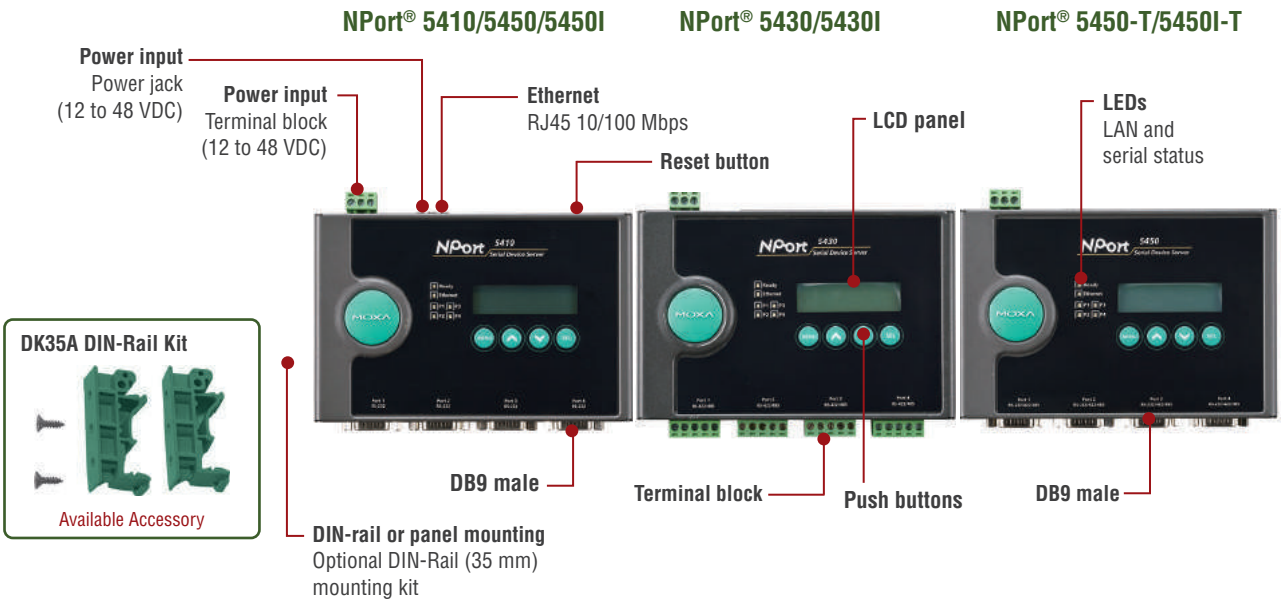
Dual DC Power Inputs

NPort® 5400 device servers support dual power sources by providing both a DC terminal block input and a DC power jack input. Providing two types of power inputs gives users greater flexibility for use with different applications.

Adjustable Termination and Pull High/Low Resistors

The NPort 5400 series provides adjustable termination and pull high/low resistors for RS-485 applications. In some critical environments, termination resistors may be needed to prevent the reflection of serial signals, and the pull high/low resistors may need adjusting to maintain the integrity of the electrical signal. Since no set of resistor values is universally compatible with all environments, the NPort® 5400 has four sets of DIP switches on the bottom panel to set the termination and pull high/low resistor values.

Appearance



Specifications

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface

Number of Ports: 4
Serial Standards:
NPort 5410: RS-232
NPort 5430/5430I: RS-422/485 (software selectable)
NPort 5450/5450I/5450-T/5450I-T: RS-232/422/485 (software selectable)
Connector:
NPort 5410/5450/5450I/5450-T/5450I-T: DB9 male
NPort 5430/5430I: Terminal block
Serial Line Protection:
2 kV isolation protection (NPort 5430I/5450I/5450I-T)
RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)
Pull High/Low Resistor for RS-485: 1 kΩ, 150 kΩ
Terminator for RS-485: 120 Ω

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS and DTR/DSR (RS-232 only), XON/XOFF
Baudrate: 50 bps to 921.6 kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IPv4, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, SNTP, Rtelnet, ARP
Configuration Options: Web Console, Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X
Linux Real TTY Drivers: Linux 2.4.x, 2.6.x, 3.x

Mini Screen with Push Buttons (for standard temp. models)

LCD Panel: Liquid Crystal Display on the case
Push Buttons: Four push buttons for convenient on-site configuration

Physical Characteristics

Housing: Metal
Weight: 740 g (1.63 lb)
Dimensions:
Without mounting kit: 158 x 103 x 33 mm (6.22 x 4.06 x 1.30 in)
With mounting kit: 181 x 103 x 33 mm (7.14 x 4.06 x 1.30 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current:
NPort 5410: 350 mA @ 12 VDC
NPort 5430: 320 mA @ 12 VDC
NPort 5430I: 530 mA @ 12 VDC
NPort 5450/5450-T: 350 mA @ 12 VDC
NPort 5450I/5450I-T: 554 mA @ 12 VDC

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 1 kV; Signal: 1 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11 DIPs

Marine: DNV (standard temp. models only)
Medical: EN 60601-1-2 Class B, EN 55011 (NPort 5410/5450/5450I only)

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)

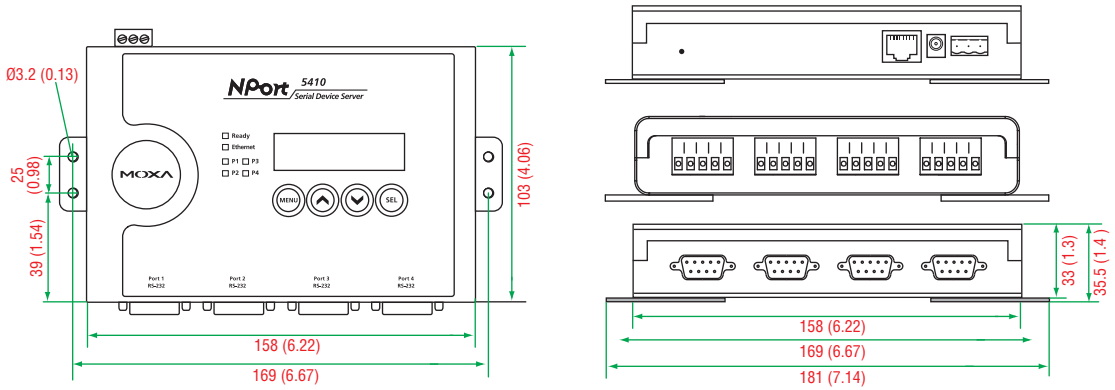
Time:
NPort 5410: 310,331 hrs
NPort 5430/5430I: 265,650 hrs
NPort 5450/5450I: 206,903 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

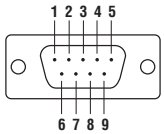
Dimensions

Unit: mm (inch)



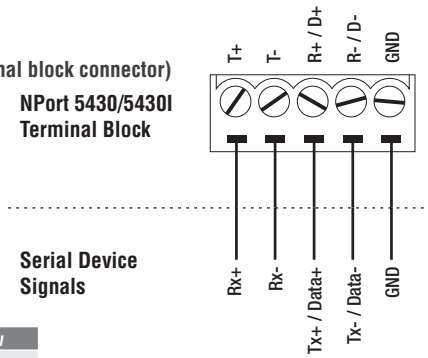
Pin Assignment

NPort® 5410
(RS-232, DB9 male connector)

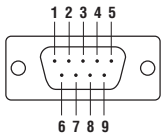


PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	–

NPort® 5430/5430I
(RS-422/485, terminal block connector)



NPort® 5450/5450I/5450-T/5450I-T
(RS-232/422/485, DB9 male connector)



PIN	RS-232	RS-422/RS-485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

Ordering Information

Available Models

NPort 5410: 4-port RS-232 device server
NPort 5430: 4-port RS-422/485 device server
NPort 5430I: 4-port RS-422/485 device server with 2 kV isolation protection
NPort 5450: 4-port RS-232/422/485 device server
NPort 5450I: 4-port RS-232/422/485 device server with 2 kV isolation protection
NPort 5450-T: 4-port RS-232/422/485 device server, -40 to 75°C operating temperature (without LCM)
NPort 5450I-T: 4-port RS-232/422/485 device server with 2 kV isolation protection, -40 to 75°C operating temperature (without LCM)

Optional Accessories (can be purchased separately)

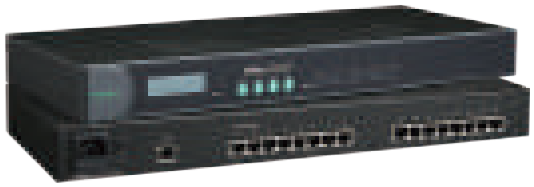
DK35A: DIN-rail mounting clips, 35 mm, 2 DIN-rail plates with 4 screws
CBL-PJTB-10: Non-locking barrel plug to bare wires cable
Mini DB9F-to-TB: DB9 female to terminal block adapter for RS-422/485 applications
Note: Additional power adapters can be purchased separately. Please refer to the Power Accessory Selection Guide for details.

Package Checklist

- 1 NPort 5400 device server
- 1 power wiring adapter: CBL-PJTB-10
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

NPort® 5600 Series

8 and 16-port RS-232/422/485 rackmount serial device servers



- 8 or 16 serial ports supporting RS-232/422/485
- Standard 19-inch rackmount size
- 10/100M auto-sensing Ethernet
- Easy IP address configuration with LCD panel (excluding wide temperature models)
- Configure via Telnet/Web/Windows utility
- Socket modes: TCP server/TCP client/UDP/Real COM
- SNMP MIB-II for network management
- Universal high-voltage range: 100 to 240 VAC or 88 to 300 VDC
- Popular low-voltage ranges: ±48 VDC (20 to 72 VDC, -20 to -72 VDC)

Overview

With the NPort® 5600 rackmount series, you not only protect your current hardware investment, but also allow for future network expansion by centralizing the management of your serial devices and distributing management hosts over the network.

Network Readiness for up to 16 Serial Devices

Only basic configuration is needed with the NPort® 5600 to connect up to 16 serial devices to an Ethernet network.

19-inch Rackmount Device Server

NPort® 5600 device servers come with Tx/Rx LEDs for the serial ports on the front panel, and 8 or 16 RJ45 serial port connectors on the rear panel. This makes the NPort® 5600 device servers suitable for a standard 19-inch rackmount, allowing you to simplify operational, maintenance, and administrative tasks.

Real COM/TTY Ports

Real COM/TTY drivers are provided to make the serial ports on the NPort® 5600 recognizable as Real COM ports by Windows, or Real TTY ports by Linux. In addition to supporting basic data transmission and reception, the NPort® drivers also support the RTS, CTS, DTR, DSR, and DCD control signals.

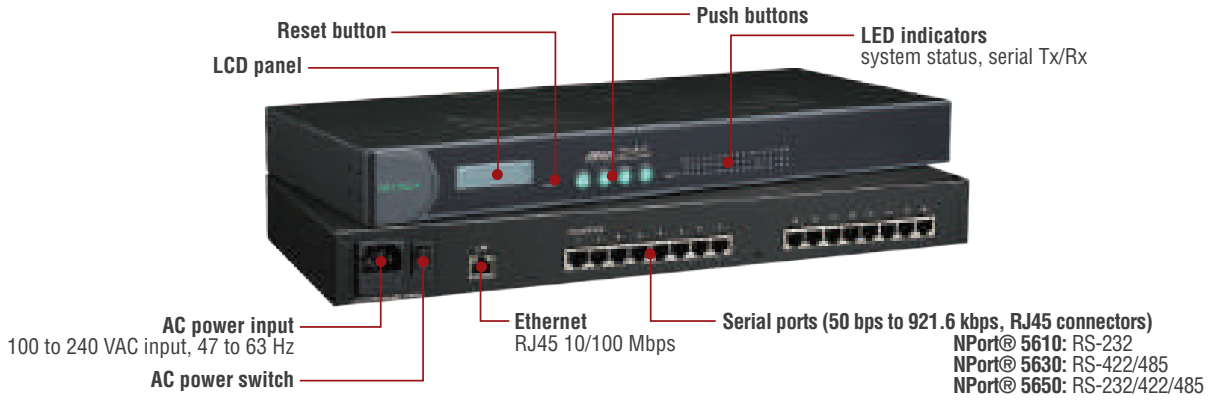
LED Indicators to Ease Your Maintenance Tasks

The System LED, serial Tx/Rx LEDs, and Ethernet LEDs (located on the RJ45 connector) provide a great tool for basic maintenance tasks and help engineers analyze problems in the field. The LEDs not only indicate current system and network status, but they also help field engineers monitor the status of attached serial devices.

Adjustable Termination and Pull High/Low Resistors

When using termination resistors to prevent serial signal reflection, it is important to set the pull high/low resistors correctly so that the electrical signal is not corrupted. Since no set of resistor values is universally compatible for all environments, the NPort® 5650-8/16 has DIP switches on the bottom panel for setting the termination and pull high/low resistor values.

Appearance



Note: LCD panel and configuration buttons not available with wide-temp. models

Specifications

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 kV built-in

Optical Fiber Interface (for -M-SC and -S-SC)

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Serial Interface

Number of Ports: 8 or 16
Serial Standards:
NPort 5610: RS-232
NPort 5630: RS-422/485
NPort 5650: RS-232/422/485
Connector: RJ45 (8 pins)
RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)
Pull High/Low Resistor for RS-485: 1 kΩ, 150 kΩ (NPort 5650-8/16)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: DSR/DTR and RTS/CTS (RS-232 only), XON/XOFF
Baudrate: 50 bps to 921.6 kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IPv4, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, SNTP, ARP, PPP, SLIP, RTelnet, RFC2217
Configuration Options: Web Console, Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X
Linux Real TTY Drivers: Linux 2.4.x, 2.6.x, 3.x

Mini Screen with Push Buttons (for standard temp. models)

LCD Panel: Liquid Crystal Display on the case
Push Buttons: Four push buttons for convenient on-site configuration

Physical Characteristics

Housing: Metal
Weight:
NPort 5610-8: 3,340 g (7.36 lb)
NPort 5610-8-48V: 3,160 g (6.97 lb)
NPort 5630-8, 5650-8-S-SC, 5650-8-M-SC: 3,380 g (7.45 lb)
NPort 5650-8: 3,360 g (7.41 lb)
NPort 5610-16: 3,420 g (7.54 lb)
NPort 5610-16-48V: 3,260 g (7.19 lb)
NPort 5630-16: 3,400 g (7.50 lb)
NPort 5650-16: 3,460 g (7.63 lb)
NPort 5650-16-S-SC, 5650-16-M-SC: 3,440 g (7.58 lb)
NPort 5650-8-HV-T: 3,720 g (8.20 lb)
NPort 5650-16-HV-T: 3,820 g (8.42 lb)
Dimensions:
Without ears: 440 x 45 x 198 mm (17.32 x 1.77 x 7.80 in)
With ears: 480 x 45 x 198 mm (18.90 x 1.77 x 7.80 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
High Voltage Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature:
Standard Models: -20 to 70°C (-4 to 158°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
High Voltage Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage:
NPort 5610/5630/5650: 100 to 240 VAC, 47 to 63 Hz
NPort 5610-48V: ±48 VDC (20 to 72 VDC, -20 to -72 VDC)
NPort 5650-HV: 110 VDC (88 to 300 VDC)
Input Current:
NPort 5610-8/16: 141 mA @ 100 VAC, 47 to 63 Hz
NPort 5630-8/16: 152 mA @ 100 VAC, 47 to 63 Hz
NPort 5610-8/16-48V: 135 mA @ 48 VDC
NPort 5650-8/16: 158 mA @ 100 VAC, 47 to 63 Hz
NPort 5650-8/16-S-SC: 164 mA @ 100 VAC, 47 to 63 Hz
NPort 5650-8/16-M-SC: 174 mA @ 100 VAC, 47 to 63 Hz
NPort 5650-8/16-HV: 152 mA @ 88 VDC

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
NPort 5650-8/16 Series:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2.5 kV; Signal: 1 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11 DIPs
NPort 5650-8/16-HV Series:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
Medical: EN 60601-1-2 Class B, EN 55011

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)

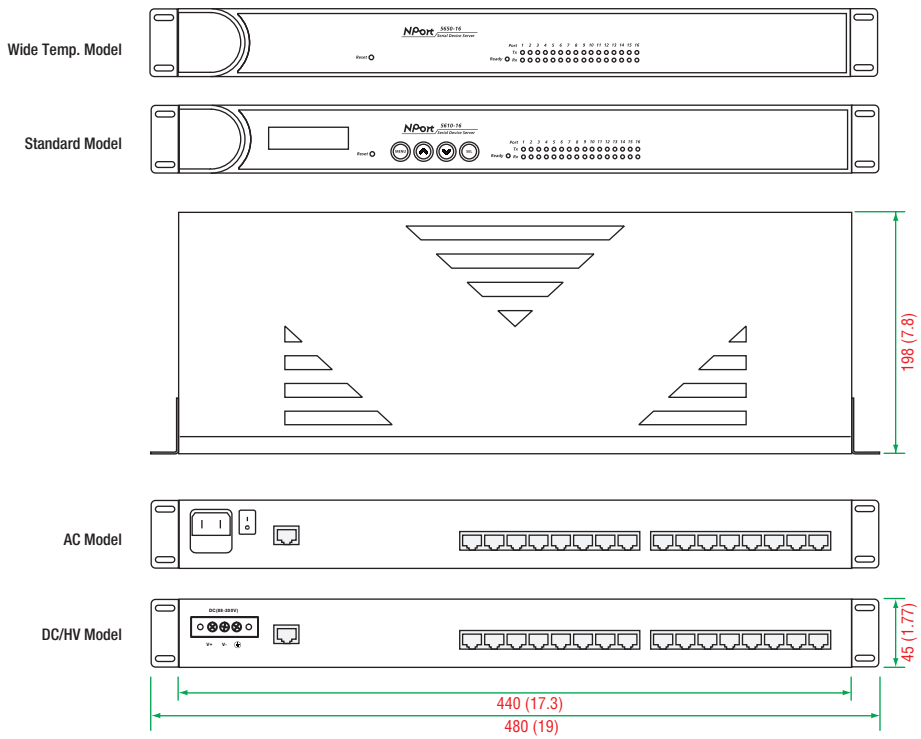
Time:
NPort 5610-8: 97,294 hrs
NPort 5610-16: 94,928 hrs
NPort 5610-8-48V: 96,758
NPort 5630-8: 118,405 hrs
NPort 5630-16: 91,483 hrs
NPort 5650-8: 117,584 hrs
NPort 5650-16: 104,767 hrs
NPort 5650-8-S-SC: 116,914 hrs
NPort 5650-8-M-SC: 116,914 hrs
NPort 5650-16-S-SC: 87,528 hrs
NPort 5650-16-M-SC: 87,528 hrs
NPort 5650-8-HV: 725,390 hrs
NPort 5650-16-HV: 531,264 hrs
NPort 5610-16-48V: 926,643 hrs
Standard:
NPort 5610-8/5610-16/5610-8-48V/NPort 5630-8/5630-16/5650-8/5650-16/5650-8-S-SC/5650-8-M-SC/5650-16-S-SC/5650-16-M-SC: MIL-HDBK-217F
NPort 5650-8-HV/5650-16-HV/5610-16-48V: Telcordia (Bellcore) Standard TR/SR

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

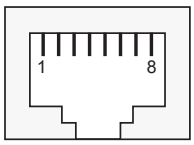
Dimensions

Unit: mm (inch)



Pin Assignment

(8-pin RJ45 connector)



NPort® 5610: RS-232

PIN	RS-232
1	DSR
2	RTS
3	GND
4	TXD
5	RxD
6	DCD
7	CTS
8	DTR

NPort® 5630: RS-422/485

PIN	RS-422/485-4w	RS-485-2w
1	–	–
2	–	–
3	TxD+	–
4	TxD-	–
5	RxD-	Data-
6	RxD+	Data+
7	GND	GND
8	–	–

NPort® 5650: RS-232/422/485

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DSR	–	–
2	RTS	TxD+	–
3	GND	GND	GND
4	TXD	TxD-	–
5	RxD	RxD+	Data+
6	DCD	RxD-	Data-
7	CTS	–	–
8	DTR	–	–

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Ordering Information

Available Models

NPort 5610-8: 8-port RS-232 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort 5610-8-48V: 8-port RS-232 rackmount device server with RJ45 connectors and ±48 VDC power input
NPort 5630-8: 8-port RS-422/485 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort 5650-8: 8-port RS-232/422/485 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort 5650-8-M-SC: 8-port RS-232/422/485 rackmount device server with multi-mode fiber (SC connector)
NPort 5650-8-S-SC: 8-port RS-232/422/485 rackmount device server with single-mode fiber (SC connector)
NPort 5650-8-T: 8-port RS-232/422/485 rackmount device server with RJ45 connectors and 100-240 VAC power input, -40 to 75°C operating temperatures
NPort 5650-8-HV-T: 8-port RS-232/422/485 to rackmount device server with RJ45 connectors and 88 to 300 VDC power input, -40 to 85°C operating temperature
NPort 5610-16: 16-port RS-232 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort 5610-16-48V: 16-port RS-232 rackmount device server with RJ45 connectors and ±48 VDC power input
NPort 5630-16: 16-port RS-422/485 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort 5650-16: 16-port RS-232/422/485 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort 5650-16-M-SC: 16-port RS-232/422/485 rackmount device server with multi-mode fiber (SC connector)
NPort 5650-16-S-SC: 16-port RS-232/422/485 rackmount device server with single-mode fiber (SC connector)
NPort 5650-16-T: 16-port RS-232/422/485 rackmount device server with RJ45 connectors and 100-240 VAC power input, -40 to 75°C operating temperatures
NPort 5650-16-HV-T: 16-port RS-232/422/485 to rackmount device server with RJ45 connectors and 88 to 300 VDC power input, -40 to 85°C operating temperature

Optional Accessories (can be purchased separately)

CBL-RJ45F25-150: 8-pin RJ45 to DB25 female cable, 150 cm
CBL-RJ45M25-150: 8-pin RJ45 to DB25 male cable, 150 cm
CBL-RJ45F9-150: 8-pin RJ45 to DB9 female cable, 150 cm
CBL-RJ45M9-150: 8-pin RJ45 to DB9 male cable, 150 cm
Note: One power cord suitable for your region is included in the product package. Additional power cords can be purchased separately. Please refer to the Power Accessory Selection Guide for details.

Package Checklist

- 1 NPort 5600 device server
- 1 power cord (suitable for your region, AC models only)
- 1 DIN-rail/wall-mounting kit: WK-45-01
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Note: The package includes one power cord (AC models) suitable for your region.

NPort® 5600-8-DT Lite Series

8-port RS-232/422/485 serial device servers

- 8 serial ports supporting RS-232/422/485
- Compact desktop design
- 10/100M auto-sensing Ethernet
- Configure via Telnet/Web/Windows utility
- Socket modes: TCP server/TCP client/UDP/Real COM
- SNMP MIB-II for network management

Overview

NPort® 5600-8-DTL device servers can conveniently and transparently connect 8 serial devices to an Ethernet network, allowing you to network your existing serial devices with basic configurations. You can both centralize management of your serial devices and distribute management hosts over the network. The NPort® 5600-8-DTL device servers have a smaller form factor than our 19-inch models, making them a great choice for applications that need additional serial ports when mounting rails are not available.

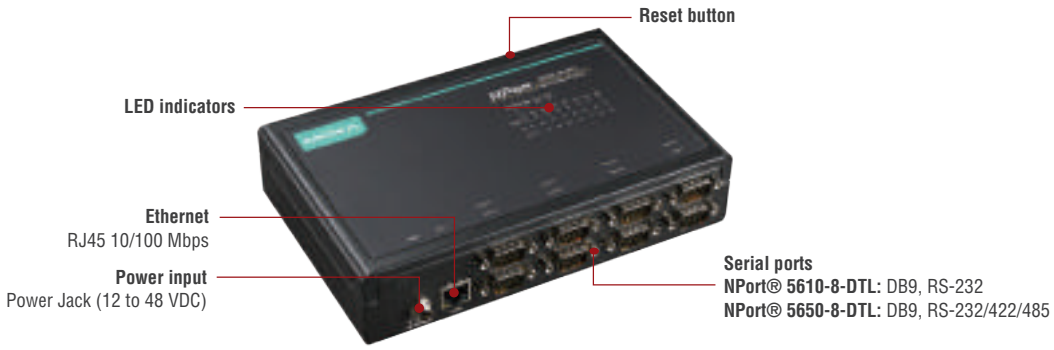
Convenient Design for RS-485 Applications

The NPort® 5650-8-DTL device servers support selectable 1 kΩ and 150 kΩ pull high/low resistors and a 120 Ω terminator. In some critical environments, termination resistors may be needed to prevent the reflection of serial signals. When using termination resistors, it is also important to set the pull high/low resistors correctly so that the electrical signal is not corrupted. Since no set of resistor values is universally compatible with all environments, NPort® 5600-8-DTL device servers use DIP switches to allow users to adjust termination and pull high/low resistor values manually for each serial port.

LED Indicators to Ease Your Maintenance Tasks

The System LED, Serial Tx/Rx LEDs, and Ethernet LEDs (located on the RJ45 connector) provide a great tool for basic maintenance tasks and help engineers analyze problems in the field. The NPort® 5600's LEDs not only indicate current system and network status, but they also help field engineers monitor the status of attached serial devices.

Appearance



Specifications

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface

Number of Ports: 8
Serial Standards:
NPort 5610-8-DTL: RS-232
NPort 5650-8-DTL/5650I-8-DTL: RS-232/422/485
Connector: DB9 male
Serial Line Protection:
15 kV ESD protection for all signals
2 kV isolation protection (NPort 5650I-8-DTL only)

RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)
Pull High/Low Resistor for RS-485: 1 kΩ, 150 kΩ
Terminator for RS-485: 120 Ω

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: DSR/DTR and RTS/CTS (RS-232 only), XON/XOFF
Baudrate: 50 bps to 921.6 kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IPv4, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, SNTP, Rtelnet, ARP, RFC2217
Configuration Options: Web Console, Telnet Console, Serial Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X
Linux Real TTY Drivers: Linux 2.4.x, 2.6.x, 3.x

Physical Characteristics

Housing: Metal
Weight:
NPort 5610-8-DTL: 1,760 g (3.88 lb)
NPort 5650-8-DTL: 1,770 g (3.90 lb)
NPort 5650I-8-DTL: 1,850 g (4.08 lb)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current:
NPort 5610-8-DTL: 340 mA @ 12 VDC
NPort 5650-8-DTL: 470 mA @ 12 VDC
NPort 5650I-8-DTL: 740 mA @ 12 VDC

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz, 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11 DIPs

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)

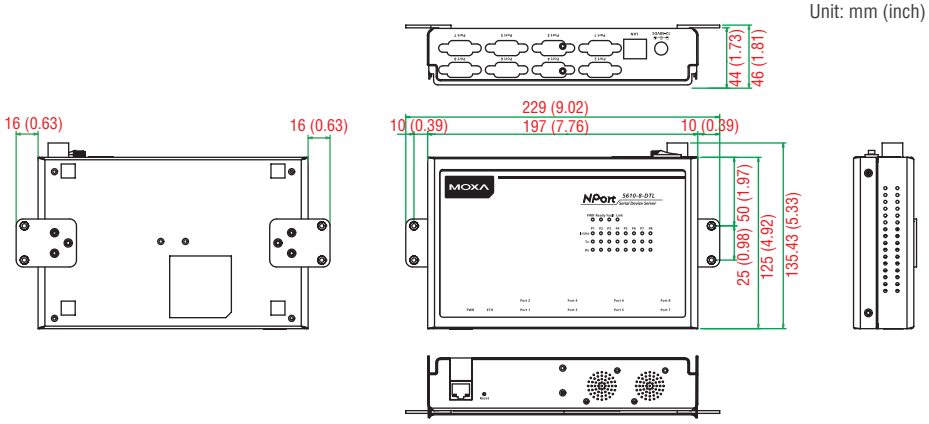
Time: NPort 5610-8-DTL: 953,388 hrs
NPort 5650-8-DTL: 740,457 hrs
NPort 5650I-8-DTL: 258,150 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

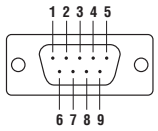
Dimensions

Unit: mm (inch)



Pin Assignment

DB9 male connector



PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

Ordering Information

Available Models

NPort 5610-8-DTL: 8-port RS-232 desktop device server with DB9 male connectors, 0 to 60°C operating temperature
NPort 5650-8-DTL: 8-port RS-232/422/485 desktop device server with DB9 male connectors, 0 to 60°C operating temperature
NPort 5650I-8-DTL: 8-port RS-232/422/485 desktop device server with DB9 male connectors and 2 kV isolation, 0 to 60°C operating temperature
NPort 5610-8-DTL-T: 8-port RS-232 desktop device server with DB9 male connectors, -40 to 75°C operating temperature
NPort 5650-8-DTL-T: 8-port RS-232/422/485 desktop device server with DB9 male connectors, -40 to 75°C operating temperature
NPort 5650I-8-DTL-T: 8-port RS-232/422/485 desktop device server with DB9 male connectors and 2 kV isolation, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DK35A: DIN-rail mounting clips, 35 mm, 2 DIN-rail plates with 4 screws
CBL-PJ21NOPEN-BK-30: Locking barrel plug to bare-wires cable
Mini DB9F-to-TB: DB9 female to terminal block adapter for RS-422/485 applications
WK-35-04: Wall-mounting kit, 2 plates with 6 screws
PWR-12200-DT-S1: Desktop power supply (requires power cord), 12 VDC 2 A, 100-240 VAC, 0 to 40°C operating temperature
Note: One power cord suitable for your region is included in the product package. Additional power cords can be purchased separately. Please refer to the Power Accessory Selection Guide for details.

Package Checklist

- 1 NPort 5600-8-DTL device server
- 100 to 240 VAC power adapter (excluding T model): PWR-12200-DT-S1
- 1 Ethernet cable: CBL-RJ458P-100
- 1 wall-mounting kit: WK-35-04
- 1 power cord (suitable for your region)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Note: The package includes one power cord suitable for your region.

NPort® IA5000A Series

1, 2, and 4-port serial device servers for industrial automation

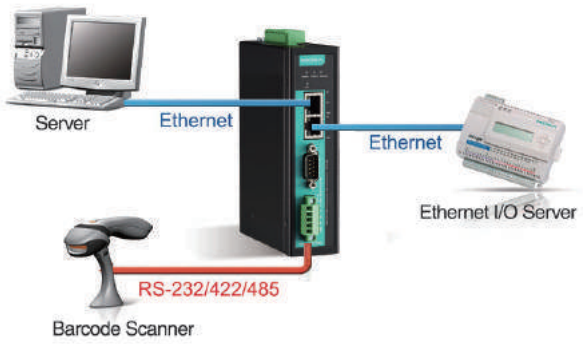
- Enhanced surge protection for LAN/serial/power
- 2 kV isolation for serial signals (isolation models)
- Screw-type terminal blocks for secure power/serial connections
- C1D2, ATEX, and IECEx certified for harsh industrial environments
- Cascading Ethernet ports for easy wiring
- Redundant DC power inputs
- Warning by relay output and email
- -40 to 75°C operating temperature range (T models)

Overview

The NPort IA5000A series device servers are designed for connecting industrial automation serial devices, such as PLCs, sensors, meters, motors, drives, barcode readers, and operator displays. The device servers are built solid with a metal housing, screw connectors, and provide full surge protection. The NPort IA5000A series device servers are extremely user-friendly, making simple and reliable serial-to-Ethernet solutions possible.

Cascading Ethernet Ports Make Wiring Easy (10/100BaseTX models only)

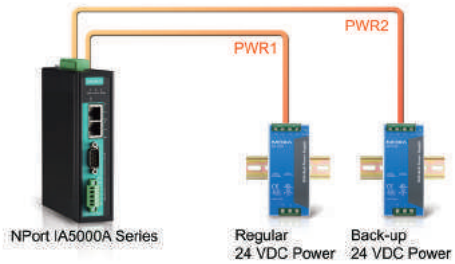
The NPort IA5000A series device servers each have two Ethernet ports that can be used as Ethernet switch ports. One port connects directly to the network or server, and the other port can be connected to either another NPort IA device server or another Ethernet device. The dual Ethernet ports help reduce wiring costs by eliminating the need to connect each device to a separate Ethernet switch.



Redundant Power Inputs

The NPort IA5000A series device servers have two power inputs that can be connected simultaneously to live DC power sources. If one power source fails, the other source takes over automatically. Redundant power inputs help ensure uninterrupted operation of your device server.

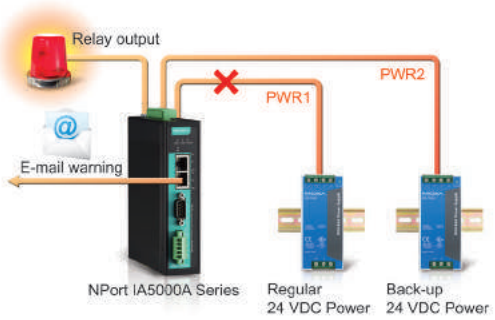
Dual Power Inputs



Relay Output Warning and E-mail Alerts

The built-in relay output can be used to alert administrators when the network is down, when power failure occurs, or when there is a change in the DCD or DSR serial signals. An e-mail warning can also be issued when an abnormality is detected. These functions are valuable tools that enable maintenance engineers to react promptly to emergency situations.

Power Failure Alarm



Surge Protection for Serial, LAN, and Power

Moxa's leading-edge surge immunity solution, which is applied to the NPort® IA5000A's serial, power, and Ethernet lines, is tested and proven compliant with IEC 61000-4-5. This advanced surge protection provides a robust serial-to-Ethernet solution that can protect electrical devices from voltage spikes and resist electrical interference, such as in oil, gas, and power automation applications.

Industrial-Grade Certification

To ensure safe and reliable operation in industrial environments, the NPort® IA5000A device servers have obtained various industrial certifications, including an IP30 rating for mechanical protection and UL 508 safety certification for industrial control equipment. In addition, these device servers are UL/cUL listed (for Class 1, Division 2, Groups A,B,C,D), ATEX Class 1 Zone 2, and IECEx compliant for use in hazardous locations.

Specifications

Ethernet Interface

Number of Ports: 2
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 kV built-in
Ethernet Line Protection: 1 kV (level 2) surge protection

Serial Interface

Number of Ports:
NPort IA5150A: 1
NPort IA5250A: 2
NPort IA5450A: 4
Serial Standards: RS-232/422/485
Connector:
NPort IA5150A: DB9 for RS-232, terminal block for RS-422/485
NPort IA5250A/IA5450A: DB9 for RS-232/422/485
Serial Line Protection:
• 2 kV isolation protection for isolation models
• 1 kV (level 2) surge protection
RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS and DTR/DSR (RS-232 only), XON/XOFF
Baudrate: 50 to 921.6 kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IPv4, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP, HTTP, SMTP, SNTP, IGMP, ARP
Configuration Options: Web Console, Serial Console, Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X
Linux Real TTY Drivers: Linux 2.4.x, 2.6.x, 3.x

Physical Characteristics

Housing: Metal
Weight:
NPort IA5150A: 475 g (1.05 lb)
NPort IA5250A: 485 g (1.07 lb)
NPort IA5450A: 560 g (1.23 lb)
Dimensions:
NPort IA5150A/IA5250A: 36 x 105 x 140 mm (1.42 x 4.13 x 5.51 in)
NPort IA5450A: 45.8 x 134 x 105 mm (1.8 x 5.28 x 4.13 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC

Input Current:
NPort IA5150A: 220 mA @ 12 VDC
NPort IA5150AI: 225 mA @ 12 VDC
NPort IA5250A: 250 mA @ 12 VDC
NPort IA5250AI: 290 mA @ 12 VDC
NPort IA5450A: 374 mA @ 12 VDC
NPort IA5450AI: 512 mA @ 12 VDC

Standards and Certifications

Safety: UL 508
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Class I Zone 2, IECEx
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m; Signal: 10 V/m
IEC 61000-4-8 PFMF
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Shock: IEC 60068-2-27

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)

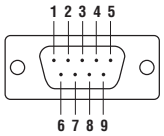
Time: 262,805 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

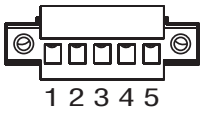
Pin Assignment

RS-232/422/485 DB9 male port



PIN	RS-232	RS-422/RS-485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RXD	TxD+(B)	–
3	TXD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

RS-422/485 Terminal Block Wiring

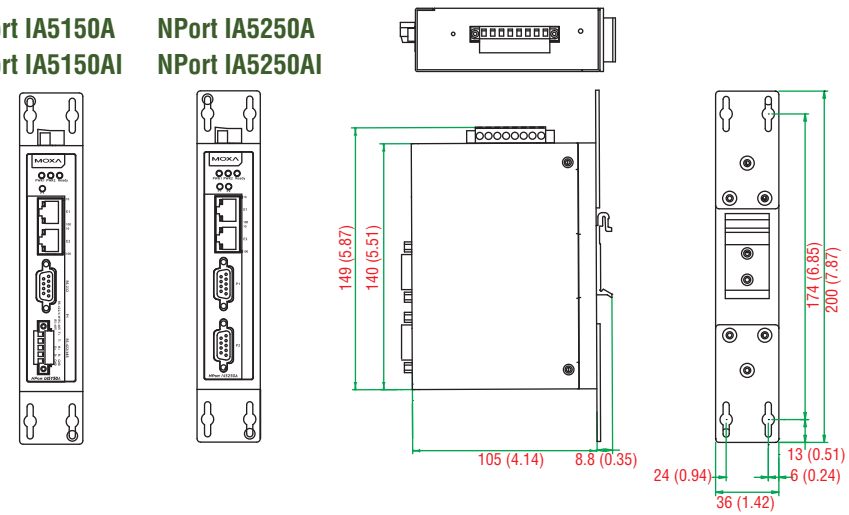


PIN	RS-422/RS-485-4w	RS-485-2w
1	TxD+(B)	–
2	TxD-(A)	–
3	RxD+(B)	Data+(B)
4	RxD-(A)	Data-(A)
5	GND	GND

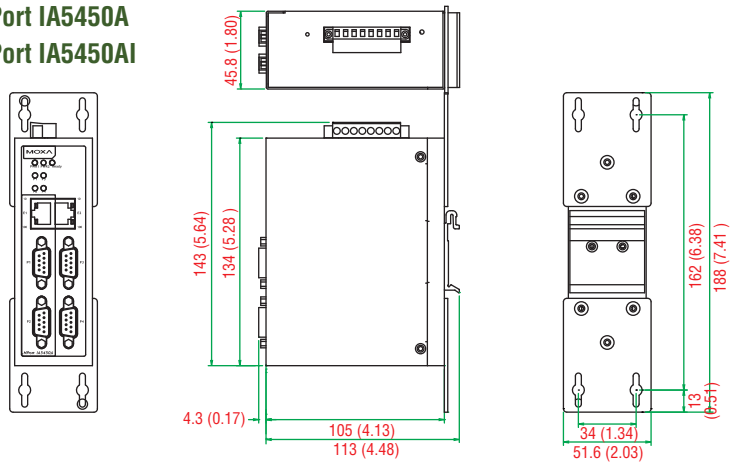
Dimensions

Unit: mm (inch)

NPort IA5150A NPort IA5150AI NPort IA5250A NPort IA5250AI



NPort IA5450A NPort IA5450AI



Ordering Information

Available Models

NPort IA5150A: 1-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, 0 to 60°C operating temperature
NPort IA5150AI: 1-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, 2 kV isolation, 0 to 60°C operating temperature
NPort IA5250A: 2-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, 0 to 60°C operating temperature
NPort IA5250AI: 2-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, 2 kV isolation, 0 to 60°C operating temperature
NPort IA5450A: 4-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, 0 to 60°C operating temperature
NPort IA5450AI: 4-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, 2 kV isolation protection, 0 to 60°C operating temperature
NPort IA5150A-T: 1-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, -40 to 75°C operating temperature
NPort IA5150AI-T: 1-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, 2 kV isolation, -40 to 75°C operating temperature
NPort IA5250A-T: 2-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, -40 to 75°C operating temperature
NPort IA5250AI-T: 2-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, 2 kV isolation, -40 to 75°C operating temperature
NPort IA5450A-T: 4-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, -40 to 75°C operating temperature
NPort IA5450AI-T: 4-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, 2 kV isolation protection, -40 to 75°C operating temperature

IECEx Models

NPort IA5150A-IEX: 1-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, IECEx, 0 to 60°C operating temperature
NPort IA5150AI-IEX: 1-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, 2 kV isolation, IECEx, 0 to 60°C operating temperature
NPort IA5250A-IEX: 2-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, IECEx, 0 to 60°C operating temperature
NPort IA5250AI-IEX: 2-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, 2 kV isolation, IECEx, 0 to 60°C operating temperature
NPort IA5450A-IEX: 4-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, IECEx, 0 to 60°C operating temperature
NPort IA5450AI-IEX: 4-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, 2 kV isolation protection, IECEx, 0 to 60°C operating temperature
NPort IA5150A-T-IEX: 1-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, IECEx, -40 to 75°C operating temperature
NPort IA5150AI-T-IEX: 1-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, 2 kV isolation, IECEx, -40 to 75°C operating temperature
NPort IA5250A-T-IEX: 2-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, IECEx, -40 to 75°C operating temperature
NPort IA5250AI-T-IEX: 2-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, 2 kV isolation, IECEx, -40 to 75°C operating temperature
NPort IA5450A-T-IEX: 4-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, IECEx, -40 to 75°C operating temperature
NPort IA5450AI-T-IEX: 4-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, 2 kV isolation protection, IECEx, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

Mini DB9F-to-TB: DB9 female to terminal block adapter for RS-422/485 applications
WK-36-02: Wall-mounting kit for the NPort IA5150A/IA5250A
WK-51-01: Wall-mounting kit for the NPort IA5450A

Package Checklist

- 1 NPort IA5000A series device server
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

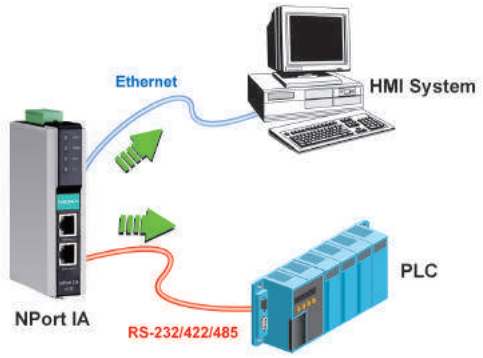
NPort® IA5000 Series

1 and 2-port serial device servers for industrial automation

- Socket modes: TCP server/TCP client/UDP
- Patented ADDC® (automatic data direction control) for 2-wire and 4-wire RS-485
- Cascading Ethernet ports for easy wiring (applies only to RJ45 connectors)
- Redundant DC power inputs
- Warning by relay output and e-mail
- 10/100BaseTX (RJ45) or 100BaseFX (single mode or multi-mode with SC connector)
- IP30-rated housing

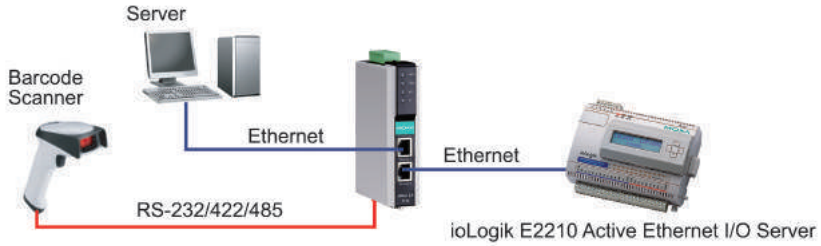
Overview

NPort® IA device servers provide easy and reliable serial-to-Ethernet connectivity for industrial automation applications. The device servers can connect any serial device to an Ethernet network, and to ensure compatibility with network software, they support a variety of port operation modes, including TCP Server, TCP Client, and UDP. The rock-solid reliability of the NPort® IA device servers makes them an ideal choice for establishing network access to RS-232/422/485 serial devices such as PLCs, sensors, meters, motors, drives, barcode readers, and operator displays. All models are housed in a compact, rugged housing that is DIN-rail mountable.



Cascading Ethernet Ports Make Wiring Easy (10/100BaseTX models only)

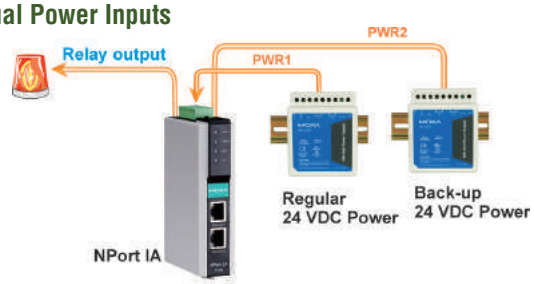
The NPort® IA5150 and IA5250 device servers each have two Ethernet ports that can be used as Ethernet switch ports. One port connects directly to the network or server, and the other port can be connected to another either NPort® IA device server or another Ethernet device. The dual Ethernet ports help reduce wiring costs by eliminating the need to connect each device to a separate Ethernet switch.



Redundant Power Inputs

The NPort® IA5000 device servers have two power inputs that can be connected simultaneously to live DC power sources. If one power source fails, the other source takes over automatically. Redundant power inputs help assure that your device server will operate nonstop.

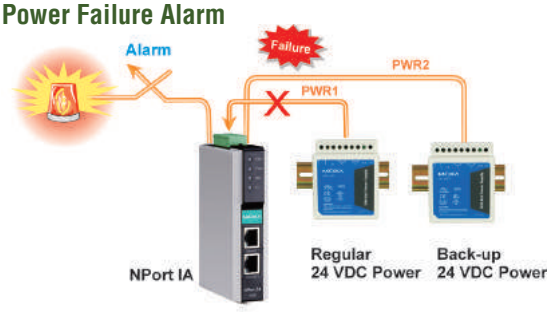
Dual Power Inputs



Relay Output Warning and E-mail Alerts

The built-in relay output can be used to alert administrators of problems with the Ethernet links or power inputs, or when there is a change in the DCD or DSR serial signals. The web console indicates which Ethernet link or power input has failed, or which serial signal has changed. An e-mail warning can also be issued when an exception is detected. These functions are valuable tools that enable maintenance engineers to react promptly to emergency situations.

Power Failure Alarm



Optical Fiber for Ethernet Communication

The NPort® IA5000 series includes 100BaseFX fiber models that support transmission distances up to 5 km for multi-mode models, and up to 40 km for single-mode models. Optical fiber is well-suited for industrial applications because it is immune to electromagnetic noise and interference. For environments that experience high ground loop voltages, fiber provides the best isolation protection, and because there is no danger of sparking, optical fiber is safer than copper wire to use in hazardous environments.

Industrial-Grade Certification

To ensure safe and reliable operation in industrial environments, the NPort® IA5000 device servers have obtained various industrial certifications, including an IP30 rating for mechanical protection, UL 508 safety certification for industrial control equipment, and explosion-safe certifications for hazardous locations. Certifications include UL/cUL Class 1 Division 2 Groups A, B, C, D, ATEX Class 1 Zone 2, and IECEx Zone 2.

Specifications

Ethernet Interface (NPort IA5150/5150I/5250)

Number of Ports: 2
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 kV built-in

Optical Fiber Interface (-M-SC and -S-SC models)

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Serial Interface

Number of Ports:
NPort IA5150: 1
NPort IA5250: 2
Serial Standards: RS-232/422/485
Connector:
NPort IA5150: DB9 male for RS-232, terminal block for RS-422/485
NPort IA5250: DB9 male for RS-232/422/485

Serial Line Protection:
2 kV isolation protection (NPort IA5150I, NPort 5150I-M-SC, NPort 5150I-S-SC, NPort IA5250I)
RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS and DTR/DSR (RS-232 only), XON/XOFF
Baudrate: 110 bps to 230.4 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IPv4, TCP, UDP, DHCP, BOOTP, Telnet, Rtelnet, DNS, SNMP V1, HTTP, SMTP, SNTP, ARP
Configuration Options: Web Console, Serial Console, Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 x86/x64, 2012 x64, Embedded CE 5.0/6.0, XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i
Linux Real TTY Drivers: Linux 2.4.x, 2.6.x, 3.x

Physical Characteristics

Housing: Plastic, IP30 protection
Weight:
NPort IA5150: 360 g (0.79 lb)
NPort IA5250: 380 g (0.84 lb)
Dimensions: 29 x 89.2 x 118.5 mm (0.82 x 3.51 x 4.57 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current:
NPort IA5150: 238 mA @ 12 VDC
NPort IA5150I: 257 mA @ 12 VDC
NPort IA5250: 238 mA @ 12 VDC
NPort IA5250I: 300 mA @ 12 VDC
NPort IA5150-S-SC: 328 mA @ 12 VDC
NPort IA5150I-S-SC: 333 mA @ 12 VDC
NPort IA5150-M-SC: 315 mA @ 12 VDC
NPort IA5150I-M-SC: 339 mA @ 12 VDC

Standards and Certifications

Safety: UL 508, UL 60950-1
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2, IECEx Zone 2
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m; Signal: 10 V/m
IEC 61000-4-8 PFMF
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Marine: DNV
Shock: IEC 60068-2-27

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)
Water and Dust Proof: IP30

MTBF (mean time between failures)

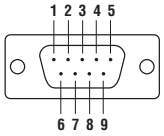
Time:
NPort IA5150 Series: 183,747 hrs
NPort IA5150I Series: 195,614 hrs
NPort IA5250 Series: 194,765 hrs
NPort IA5250I Series: 341,417 hrs
Standard:
NPort IA5150 Series/NPort IA5150I Series/NPort IA5250 Series: MIL-HDBK-217F
NPort IA5250I Series: Telcordia (Bellcore) Standard TR/SR

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

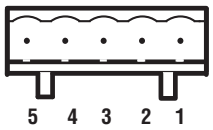
Pin Assignment

RS-232/422/485 DB9 male port



PIN	RS-232	RS-422/RS-485-4w	RS-485-2W
1	DCD	TxD-(A)	–
2	RXD	TxD+(B)	–
3	TXD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

RS-422/485 Terminal Block Wiring

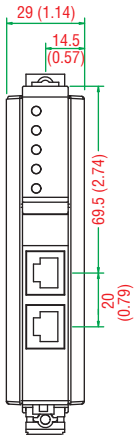


PIN	RS-422/RS-485-4w	RS-485-2w
1	TxD+(B)	–
2	TxD-(A)	–
3	RxD+(B)	Data+(B)
4	RxD-(A)	Data-(A)
5	GND	GND

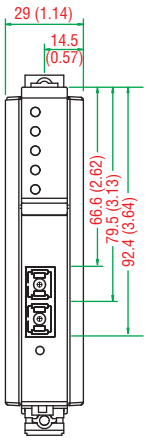
Dimensions

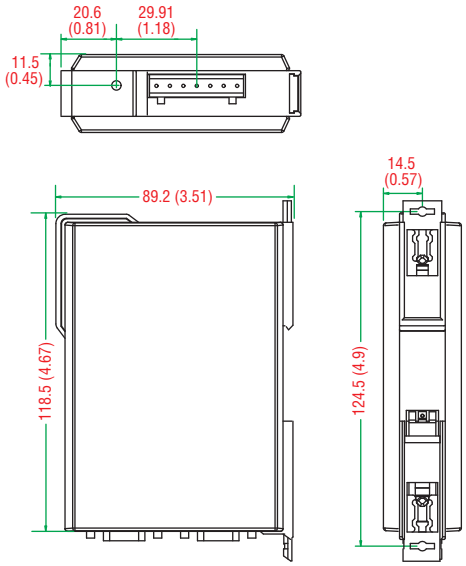
Unit: mm (inch)

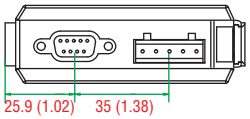
NPort IA5150
NPort IA5150I
NPort IA5250
NPort IA5250I



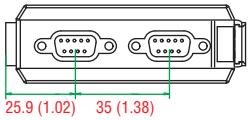
NPort IA5150-M-SC
NPort IA5150-S-SC
NPort IA5150I-M-SC
NPort IA5150I-S-SC







NPort IA5150
NPort IA5150I
NPort IA5150-M-SC
NPort IA5150-S-SC
NPort IA5150I-S-SC
NPort IA5150I-M-SC



NPort IA5250
NPort IA5250I

Ordering Information

Available Models

NPort IA5150: 1 RS-232/422/485 port to 2 10/100BaseT(X) ports, 0 to 55°C operating temperature
NPort IA5150I: 1 RS-232/422/485 port to 2 10/100BaseT(X) ports, 2 kV isolation protection, 0 to 55°C operating temperature
NPort IA5150-M-SC: 1 RS-232/422/485 port to 1 100BaseFX multi-mode port, SC, 0 to 55°C operating temperature
NPort IA5150I-M-SC: 1 RS-232/422/485 port to 1 100BaseFX multi-mode port, SC, 2 kV isolation protection, 0 to 55°C operating temperature
NPort IA5150-S-SC: 1 RS-232/422/485 port to 1 100BaseFX single-mode port, SC, 0 to 55°C operating temperature
NPort IA5150I-S-SC: 1 RS-232/422/485 port to 1 100BaseFX single-mode port, SC, 2 kV isolation protection, 0 to 55°C operating temperature
NPort IA5250: 2 RS-232/422/485 ports to 2 10/100BaseT(X) ports, 0 to 55°C operating temperature
NPort IA5250I: 2 RS-232/422/485 ports to 2 10/100BaseT(X) ports, 2 kV isolation protection, 0 to 55°C operating temperature
NPort IA5150-T: 1 RS-232/422/485 port to 2 10/100BaseT(X) ports, -40 to 75°C operating temperature
NPort IA5150I-T: 1 RS-232/422/485 port to 2 10/100BaseT(X) ports, 2 kV isolation protection, -40 to 75°C operating temperature
NPort IA5150-M-SC-T: 1 RS-232/422/485 port to 1 100BaseFX multi-mode port, SC, -40 to 75°C operating temperature
NPort IA5150I-M-SC-T: 1 RS-232/422/485 port to 1 100BaseFX multi-mode port, SC, 2 kV isolation protection, -40 to 75°C operating temperature
NPort IA5150-S-SC-T: 1 RS-232/422/485 port to 1 100BaseFX single-mode port, SC, -40 to 75°C operating temperature
NPort IA5150I-S-SC-T: 1 RS-232/422/485 port to 1 100BaseFX single-mode port, SC, 2 kV isolation protection, -40 to 75°C operating temperature
NPort IA5250-T: 2 RS-232/422/485 ports to 2 10/100BaseT(X) ports, -40 to 75°C operating temperature
NPort IA5250I-T: 2 RS-232/422/485 ports to 2 10/100BaseT(X) ports, 2 kV isolation protection, -40 to 75°C operating temperature

IECEx Models

NPort IA5150-IEX: 1 RS-232/422/485 port to 2 10/100BaseT(X) ports, IECEx, 0 to 55°C operating temperature
NPort IA5150I-IEX: 1 RS-232/422/485 port to 2 10/100BaseT(X) ports, 2 kV isolation protection, IECEx, 0 to 55°C operating temperature
NPort IA5150-M-SC-IEX: 1 RS-232/422/485 port to 1 100BaseFX multi-mode port, SC, IECEx, 0 to 55°C operating temperature
NPort IA5150I-M-SC-IEX: 1 RS-232/422/485 port to 1 100BaseFX multi-mode port, SC, 2 kV isolation protection, IECEx, 0 to 55°C operating temperature
NPort IA5150-S-SC-IEX: 1 RS-232/422/485 port to 1 100BaseFX single-mode port, SC, IECEx, 0 to 55°C operating temperature
NPort IA5150I-S-SC-IEX: 1 RS-232/422/485 port to 1 100BaseFX single-mode port, SC, 2 kV isolation protection, IECEx, 0 to 55°C operating temperature
NPort IA5250-IEX: 2 RS-232/422/485 ports to 2 10/100BaseT(X) ports, IECEx, 0 to 55°C operating temperature
NPort IA5150-T-IEX: 1 RS-232/422/485 port to 2 10/100BaseT(X) ports, IECEx, -40 to 75°C operating temperature
NPort IA5150I-T-IEX: 1 RS-232/422/485 port to 2 10/100BaseT(X) ports, 2 kV isolation protection, IECEx, -40 to 75°C operating temperature
NPort IA5150-M-SC-T-IEX: 1 RS-232/422/485 port to 1 100BaseFX multi-mode port, SC, IECEx, -40 to 75°C operating temperature
NPort IA5150I-M-SC-T-IEX: 1 RS-232/422/485 port to 1 100BaseFX multi-mode port, SC, 2 kV isolation protection, IECEx, -40 to 75°C, IECEx operating temperature
NPort IA5150-S-SC-T-IEX: 1 RS-232/422/485 port to 1 100BaseFX single-mode port, SC, IECEx, -40 to 75°C operating temperature
NPort IA5150I-S-SC-T-IEX: 1 RS-232/422/485 port to 1 100BaseFX single-mode port, SC, 2 kV isolation protection, IECEx, -40 to 75°C operating temperature
NPort IA5250-T-IEX: 2 RS-232/422/485 ports to 2 10/100BaseT(X) ports, IECEx, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

Mini DB9F-to-TB: DB9 female to terminal block adapter for RS-422/485 applications

Package Checklist

- 1 NPort IA5000 series device server
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

NPort® W2150A/W2250A

1 and 2-port RS-232/422/485-to-WiFi device servers with wireless client

NPort® W2150A

NPort® W2250A

- Link any serial or Ethernet device to an IEEE 802.11a/b/g/n network
- 921.6 kbps baudrate for RS-232/422/485 transmissions
- Web-based configuration using built-in Ethernet or WLAN
- Enhanced surge protection for serial, LAN, and power
- Remote configuration with HTTPS, SSH
- Secure data access with WEP, WPA, WPA2
- Fast automatic wireless fast roaming
- Offline port buffering and serial data log
- Dual power inputs (1 screw-type power jack, 1 terminal block)
- Supports wireless clients

Overview

The NPort® W2150A and W2250A are the ideal choice for connecting your serial or Ethernet devices, such as PLCs, meters, and sensors, to a wireless LAN. Your communications software will be able to access the serial devices from anywhere over a wireless LAN. Moreover, the wireless device servers require fewer cables and are ideal for applications that involve difficult wiring situations. In Infrastructure Mode or Ad-Hoc Mode, the NPort® W2150A and NPort® W2250A can connect to Wi-Fi networks at offices and factories to allow users to move, or "roam," between several APs (Access Points), and offer an excellent solution for devices that are frequently moved from place to place.

802.11a/b/g/n Wireless Connectivity to Serial Devices

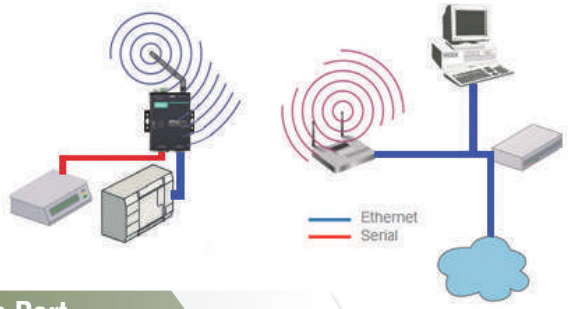
Wireless device servers require fewer cables and are ideal for applications that involve difficult wiring situations. In Infrastructure Mode or Ad-Hoc Mode, the NPort® W2150A and NPort® W2250A can communicate with any host computer through an access point, or with another NPort® W2150A or NPort® W2250A located up to 100 meters away.

Wireless Fast Roaming Function

Wi-Fi networks at offices and factories allow users to move, or "roam," between several APs (Access Points). Moxa's Fast Roaming function increases the roaming speed to unify AP channels and avoid wasting channel hopping time while roaming.

Wireless Client

Data can be seamlessly transferred between the serial line, LAN, and WAN, allowing the LAN and WLAN interfaces to be bridged together with one IP address.



Offline Port Buffering and Serial Data Log for Each Port

For mission-critical applications, data from the serial device must not be lost if the wireless connection goes down. The NPort® W2150A and NPort® W2250A are designed to continue operating if the wireless connection is disconnected temporarily. If the wireless connection is restraining, or if the connection fails, the serial data from the serial device will be queued in the built-in port buffer with over 10 MB of storage. As soon as the wireless connection returns to normal, the data stored in the buffer will be sent to its destination. In addition, a serial data log can be enabled to make troubleshooting easier.

The serial data log buffer for both the NPort® W2150A and NPort® W2250A is 64 KB per port.

Secure Remote Management and Configuration with SSH/HTTPS

Unauthorized access is one of the biggest headaches for system managers. In addition to IP filtering and password protection, the NPort® W2150A and NPort® W2250A also support SSH and HTTPS to provide protection from hackers. To transmit control messages securely, open the web console using a web browser that supports https (Internet Explorer, for example). You may also open the serial or Telnet console, such as PuTTY, using a terminal emulator that supports SSH.

Select "Any Baudrate" between 50 bps and 921.6 kbps

Most device servers only support a fixed number of serial baudrates. However, some applications require special baudrates, such as 250 kbps or 500 kbps. With the NPort® W2150A and NPort® W2250A, you can enter any baudrate between 50 and 921.6 kbps. If your device's baudrate is not a standard baudrate, select "other" from the drop-down list and then enter the baudrate.

Specifications

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: RJ45
Magnetic Isolation Protection: 1.5 kV built-in

WLAN Interface

Standard Compliance: 802.11a/b/g/n
Network Modes: Infrastructure, Ad-Hoc
Transmit Power:
802.11b:
Typ. 16 dBm ±1.5 dBm @ 1 Mbps,
Typ. 16 dBm ±1.5 dBm @ 11 Mbps
802.11a:
Typ. 15 dBm ±1.5 dBm @ 6 Mbps,
Typ. 14 dBm ±1.5 dBm @ 54 Mbps
802.11g:
Typ. 16 dBm ±1.5 dBm @ 6 Mbps,
Typ. 14 dBm ±1.5 dBm @ 54 Mbps
802.11n 2.4 GHz
Typ. 16 dBm ±1.5 dBm @ 6.5 Mbps,
Typ. 12 dBm ±1.5 dBm @ 72.2 Mbps
802.11n 5 GHz
Typ. 15 dBm ±1.5 dBm @ 6.5 Mbps,
Typ. 12 dBm ±1.5 dBm @ 150 Mbps
Receive Sensitivity:
802.11b:
-92 dBm @ 1 Mbps, -84 dBm @ 11 Mbps
802.11a:
-91 dBm @ 6 Mbps, -74 dBm @ 54 Mbps
802.11g:
-91 dBm @ 6 Mbps, -73 dBm @ 54 Mbps
802.11n 2.4 GHz
-89 dBm @ 6.5 Mbps (20 MHz), -71 dBm @ 72.2 Mbps (20 MHz)
802.11n 5 GHz
-89 dBm @ 6.5 Mbps (20 MHz), -71 dBm @ 72.2 Mbps (20 MHz)
-85 dBm @ 13.5 Mbps (40 MHz), -67 dBm @ 150 Mbps (40 MHz)
Radio Frequency Type: DSSS/OFDM
Transmission Rate:
802.11a: 54 Mbps
802.11b: 11 Mbps
802.11g: 6 to 54 Mbps
802.11n: 6.5 to 150 Mbps
Transmission Distance:
Up to 100 meters (in open areas)
Wireless Security:
• WEP: 64-bit/128-bit data encryption
• WPA, WPA2, 802.11i: Enterprise mode and Pre-Share Key (PSK) mode
• Encryption: 128-bit TKIP/AES-CCMP EAP-TLS, PEAP/GTC, PEAP/MD5, PEAP/MSCHAPV2, EAP-TTLS/PAP, EAP-TTLS/CHAP, EAP-TTLS/MSCHAP, EAP-TTLS/MSCHAPV2, EAP-TTLS/EAP-MSCHAPV2, EAP-TTLS/EAP-GTC, EAP-TTLS/EAP-MD5, LEAP
Antenna Connector: Reverse SMA

Serial Interface

Number of Ports:
NPort W2150A: 1
NPort W2250A: 2
Serial Standards: RS-232/422/485 (DB9 male connector)
Offline Port Buffering:
NPort W2150A: 20 MB
NPort W2250A: 10 MB
Serial Line Surge Protection: 1 kV (level 2)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
Baudrate: 50 bps to 921.6 kbps
Serial Data Log: 64 KB

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IPv4, TCP, UDP, DHCP, Telnet, DNS, SNMP V1/V2c/V3, HTTP, SMTP, SNTP, SSH, HTTPS, ARP
Configuration Options: Web Console, Serial Console, Telnet Console, Windows Utility
Secure Configuration Options: HTTPS, SSH
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X
Linux Real TTY Drivers: Linux 2.4.x, 2.6.x, 3.x
Utilities: NPort Search Utility and NPort Windows Driver manager
Management: SNMP MIB-II

Physical Characteristics

Housing: Aluminum sheet metal (1 mm)
Weight:
NPort W2150A: 547 g (1.21 lb)
NPort W2250A: 557 g (1.23 lb)
Dimensions:
Without ears or antenna: 77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)
With ears, without antenna: 100 x 111 x 26 mm (3.94 x 4.37 x 1.02 in)
Antenna Length: 109.79 mm (4.32 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 75°C (-4 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current:
NPort W2150A: 179 mA @ 12 VDC
NPort W2250A: 200 mA @ 12 VDC

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11 DIPs
Radio: CE (ETSI EN 301 893, ETSI EN 300 328, ETSI EN 301 489-17, ETSI EN 301 489-1), ARIB RCR STD-33, ARIB STD-66

Reliability

Alert Tool: RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)

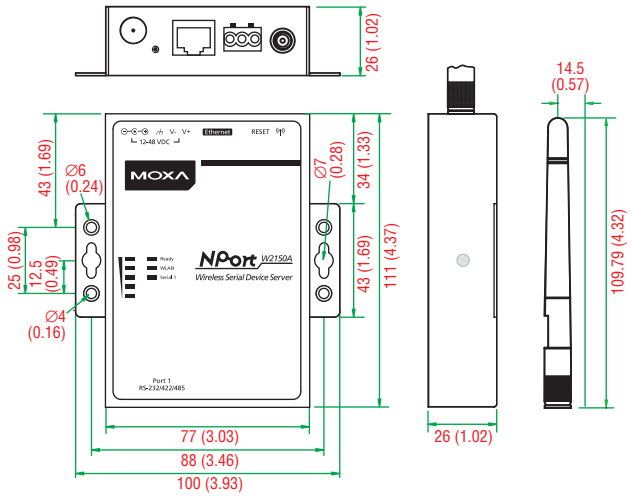
Time:
NPort W2150A: 383,187 hrs
NPort W2250A: 363,327 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

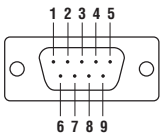
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Pin Assignment, DB9 Male



PIN	RS-232	RS-422/485-4W	RS-485-2W
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–
9	–	–	–

Ordering Information

Available Models

NPort W2150A: 1-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN (includes US/Euro/Japan/CN bands), antenna, 0 to 55°C operating temperature, includes power adapter
NPort W2250A: 2-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN (includes US/Euro/Japan/CN bands), antenna, 0 to 55°C operating temperature, includes power adapter
NPort W2150A-T: 1-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN (includes US/Euro/Japan/CN bands), -40 to 75°C operating temperature
NPort W2250A-T: 2-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN (includes US/Euro/Japan/CN bands), -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DK35A: DIN-rail mounting clips, 35 mm, 2 DIN-rail plates with 4 screws
CBL-PJ21NOPEN-BK-30: Locking barrel plug to bare-wires cable
Mini DB9F-to-TB: DB9 female to terminal block adapter for RS-422/485 applications
Note: One power adapter suitable for your region is included in the product package. Additional power adapters can be purchased separately. Please refer to the Power Accessory Selection Guide for details.

Package Checklist

- 1 NPort W2150A or NPort W2250A wireless device server
- 1 antenna 2.4/5GHz: ANT-WDB-ARM-02
- 100 to 240 VAC power adapter (excluding T models)*
- 1 Ethernet cable: CBL-RJ458P-100
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Note: The package includes one power adapter suitable for your region.

NPort® Z2150/Z3150 Series

1-port RS-232/422/485 to ZigBee converter or ZigBee-to-Ethernet gateway

NPort Z3150

NPort Z2150

- IEEE 802.15.4/ZigBee compliant
- Network topologies: Mesh/Star/Cluster tree
- 128-bit AES hardware encryption
- Enhanced surge protection for serial and power
- Dual DC power inputs (NPort Z3150 only)
- Easy-to-use configuration utility

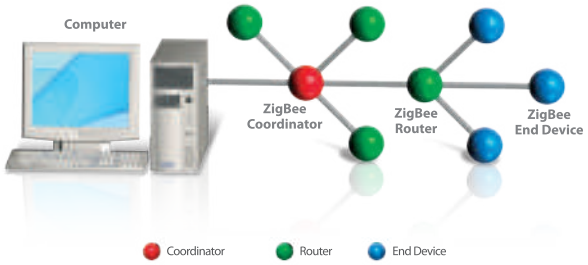
Overview

The NPort Z2150 and NPort Z3150 are IEEE 802.15.4/ZigBee compliant, providing a reliable wireless solution for serial-to-ZigBee networks requiring minimal wiring presence.

The NPort Z2150 can be configured as a ZigBee coordinator (ZC), a ZigBee router (ZR), or a ZigBee end device (ZED). Any serial device can be connected to the NPort Z2150 and exchange data via PAN. An user-friendly utility is provided to configure the device type and network settings in simple steps.

The NPort Z3150 was designed specifically to perform as a ZigBee Coordinator (ZC), providing nodes with an Ethernet interface to the ZigBee PAN. Internet connection ad network services are also provided via the ZigBee PAN. Remote users can monitor any ZigBee device in the PAN through the NPort Z3150.

The following figure shows a typical topology of a ZigBee network. The NPort Z3150 is the ZigBee coordinator (ZC) connected to numerous ZigBee routers (ZR) and the routers are connected to end devices(ZED).



Surge-Protected Serial and Power Lines

Surge, which is typically caused by high voltages that result from switching and lightning transients, is a common threat to all electrical devices. Moxa's leading-edge surge immunity solution, which is applied to the NPort Z2150/Z3150's serial and Ethernet lines, is tested and proven compliant with IEC 61000-4-5. This surge protection provides a robust solution that can protect electrical devices from voltage spikes and withstand electrically noisy environmental conditions.

Specifications

ZigBee Interface

RF Standard: 802.15.4/ZigBee compliant
Frequency Band: 2.4 GHz
RF Data Rate: 250 kbps
Rx sensitivity: -96 dBm
Tx Power: 4.5 dBm (Max)
Transmission Distance: Up tp 100 m (open space)
Antenna: 2 dBi
RF Channel: 16 channels
Device Type: Coordinator, Router (NPort Z2150 only), End Device (NPort Z2150 only)
Network Topology: Star, Mesh, Cluster tree
Security: 128-bit AES encryption algorithms

Ethernet Interface (NPort Z3150 only)

Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: RJ45
Magnetic Isolation Protection: 1.5 kV built-in

Hardware

DIP Switch: Console/Operation Mode
SW1: Pull high/low resister, Termination for RS-422/485.
Reset Button: Reset to default

Serial Interface

Number of Ports: 1
Serial Standards: RS-232/422/485
Connector: DB9 male
Serial Line Protection: 1 kV surge protection
RS-485 Data Direction Control: ADDC (Automatic Data Direction Control)

Serial Communication Parameters

Data Bits:
NPort Z2150: 8
NPort Z3150: 5, 6, 7, 8
Stop Bits: 1, 2

Parity:
NPort Z2150: None, Even, Odd
NPort Z3150: None, Even, Odd, Mark, Space
Flow Control:
NPort Z2150: RTS/CTS
NPort Z3150: RTS/CTS, XON/XOFF
Baudrate:
NPort 2150: 50 bps to 230.4 kbps
NPort 3150: 50 bps to 921.6 kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Software

Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded
Configuration:
NPort Z2150: ZigBee Configuration Utility
NPort Z3150: Web Console
Firmware Upgrade:
NPort Z2150: ZigBee Configuration Utility
NPort Z3150: Windows Utility, Web Console

Physical Characteristics

Housing: Aluminum
Weight:
NPort Z2150: 340 g (0.75 lb)
NPort Z3150: 780 g (1.72 lb)
Dimensions:
NPort Z2150:
Without ears: 52 x 80 x 22 mm (2.05 x 3.15 x 0.87 in)
With ears: 75.2 x 80 x 22 mm (2.96 x 3.15 x 0.87 in)
NPort Z3150:
Without ears: 77 x 111 x 26 mm (3.33 x 4.37 x 1.02 in)
With ears: 100 x 111 x 26 mm (3.94 x 4.37 x 1.02 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% RH

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current:
NPort Z2150: 45 mA @ 12 V
NPort Z3150: 120 mA @ 12 V
Connector: Power Jack with Screw, Terminal block (NPort Z3150 only)

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal:0.5 kV
IEC 61000-4-5 Surge: Power: 1 kV; Signal: 1 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11 DIPs
Radio: CE (ETSI EN 301 893, ETSI EN 300 328, ETSI EN 301 489-1-17, ETSI EN 301 489-1)

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)

Time:
NPort Z2150: 2,542,774 hrs
NPort Z3150: 1,109,589 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

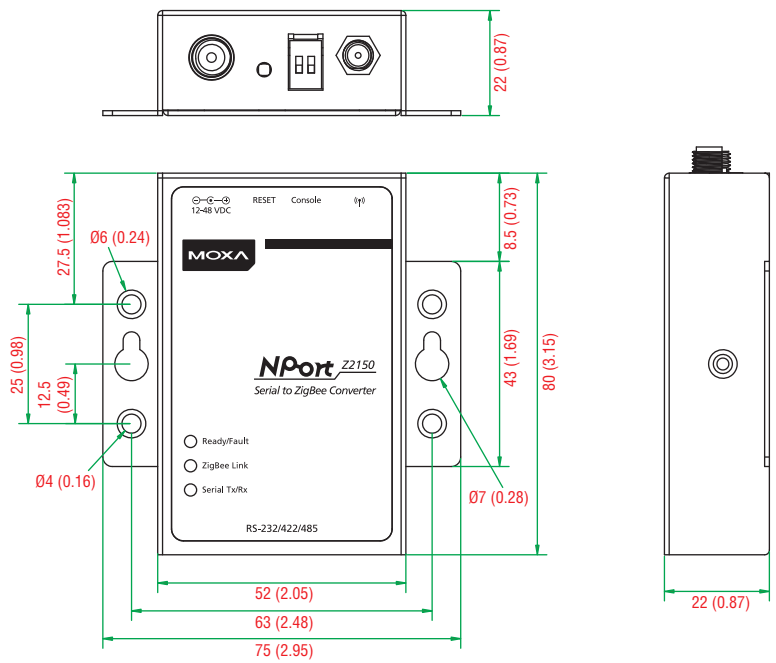
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

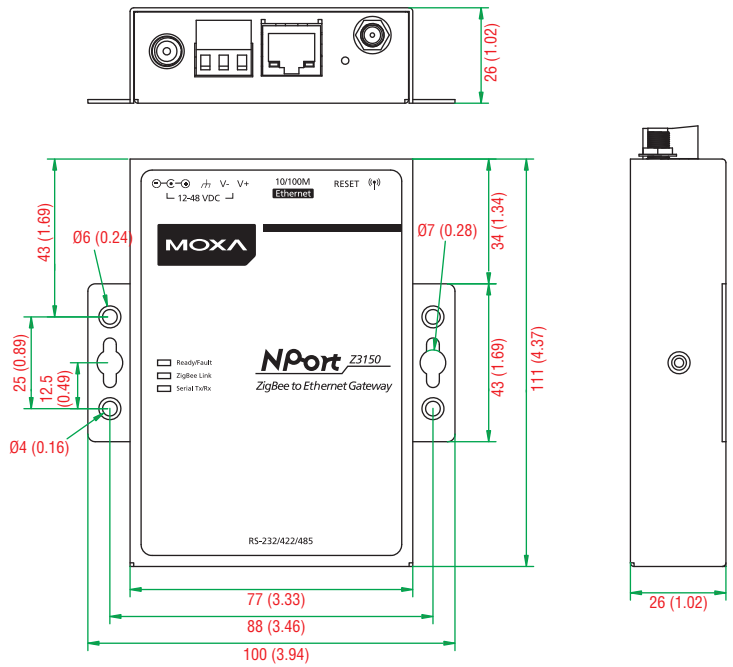
NPort® Z2150



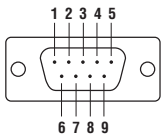
Dimensions

Unit: mm (inch)

NPort® Z3150



Pin Assignment



PIN	RS-232	RS-422/RS-485-4w	RS-485-2W
1	DCD	TxD-(A)	–
2	RXD	TxD+(B)	–
3	TXD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

Ordering Information

Available Models

NPort Z2150: 1-port RS-232/422/485 serial-to-ZigBee converter with 802.15.4, 0 to 55°C operating temperature
NPort Z3150: 1-port ZigBee-to-Ethernet gateway, 0 to 55°C operating temperature
NPort Z2150-T: 1-port RS-232/422/485 serial-to-ZigBee converter with 802.15.4, -40 to 75°C operating temperature
NPort Z3150-T: 1-port ZigBee-to-Ethernet gateway, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DK35A: DIN-rail mounting clips, 35 mm, 2 DIN-rail plates with 4 screws
CBL-PJ21NOPEN-BK-30: Locking barrel plug to bare-wires cable
Mini DB9F-to-TB: DB9 female to terminal block adapter for RS-422/485 applications
DB9F-to-TB Adapter: DB9 female to terminal block adapter for RS-422/485 applications
Note: One power adapter suitable for your region is included in the product package. Additional power adapters can be purchased separately. Please refer to the Power Accessory Selection Guide for details.

Package Checklist

- 1 NPort Z2150 or NPort Z3150
- 100 to 240 VAC power adapter (excluding T models)
- 1 2.4/5 GHz antenna: ANT-WDB-ARM-02
- Quick installation guide (printed)
- Documentation and software CD
- Warranty card

Note: The package includes one power adapter suitable for your region.

Power Accessory Selection Guide

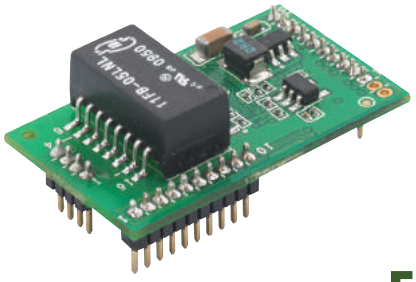
Barrel Plug Type		Locking Barrel Plug				
O/P		12 VDC 0.5 A, 100 to 240 VAC (Switch-Mode)				
Plug Type		US/JP	EU	AU	UK	CN
Appearance						
Model Name		PWR-12050-WPUSJP-S1	PWR-12050-WPEU-S1	PWR-12050-WPAU-S1	PWR-12050-WPUK-S1	PWR-12050-WPCN-S1
1 Port	NPort 5110	–	–	–	–	–
	NPort 5130	–	–	–	–	–
	NPort 5150	–	–	–	–	–
	NPort 5110A	✓	✓	✓	✓	✓
	NPort 5130A	✓	✓	✓	✓	✓
	NPort 5150A	✓	✓	✓	✓	✓
	DE-211	–	–	–	–	–
	DE-311	–	–	–	–	–
	NPort P5110A	✓	✓	✓	✓	✓
	NPort W2150A	✓	✓	✓	✓	✓
	NPort Z2150	✓	✓	✓	✓	✓
2 Ports	NPort 5210	–	–	–	–	–
	NPort 5230	–	–	–	–	–
	NPort 5232	–	–	–	–	–
	NPort 5232I	–	–	–	–	–
	NPort 5210A	✓	✓	✓	✓	✓
	NPort 5230A	✓	✓	✓	✓	✓
	NPort 5250A	✓	✓	✓	✓	✓
	NPort W2250A	✓	✓	✓	✓	✓
	NPort Z2250	✓	✓	✓	✓	✓

Barrel Plug Type		Non-Locking Barrel Plug				
O/P		12 VDC 0.5 A, 100 to 240 VAC (Switch-Mode)				
Plug Type		US/JP	EU	AU	UK	CN
Appearance						
Model Name		PWR-12050-WPUSJP-S2	PWR-12050-WPEU-S2	PWR-12050-WPAU-S2	PWR-12050-WPUK-S2	PWR-12050-WPCN-S2
1 Port	NPort 5110	✓	✓	✓	✓	✓
	NPort 5130	✓	✓	✓	✓	✓
	NPort 5150	✓	✓	✓	✓	✓
	NPort 5110A	–	–	–	–	–
	NPort 5130A	–	–	–	–	–
	NPort 5150A	–	–	–	–	–
	DE-211	✓	✓	✓	✓	✓
	DE-311	✓	✓	✓	✓	✓
	NPort P5110A	–	–	–	–	–
	NPort W2150A	–	–	–	–	–
	NPort Z2150	–	–	–	–	–
2 Ports	NPort 5210	✓	✓	✓	✓	✓
	NPort 5230	✓	✓	✓	✓	✓
	NPort 5232	✓	✓	✓	✓	✓
	NPort 5232I	✓	✓	✓	✓	✓
	NPort 5210A	–	–	–	–	–
	NPort 5230A	–	–	–	–	–
	NPort 5250A	–	–	–	–	–
	NPort W2250A	–	–	–	–	–
	NPort Z2250	–	–	–	–	–

Power Accessory Selection Guide

Barrel Plug Type		Non-Locking Barrel Plug				
O/P		12 VDC 1.25/1.5 A, 100 to 240 VAC				
Plug Type		US/JP	EU	AU	UK	CN
Appearance						
Model Name		PWR-12125-USJP-S1	PWR-12150-EU-S2	PWR-12150-AU-S2	PWR-12150-UK-S2	PWR-12125-CN-S1
4 Ports	NPort 5410	✓	✓	✓	✓	✓
	NPort 5430	✓	✓	✓	✓	✓
	NPort 5430I	✓	✓	✓	✓	✓
	NPort 5450	✓	✓	✓	✓	✓
	NPort 5450I	✓	✓	✓	✓	✓
8 Ports	NPort 5610-8	–	–	–	–	–
	NPort 5630-8	–	–	–	–	–
	NPort 5650-8	–	–	–	–	–
	NPort 5650-8-M-SC	–	–	–	–	–
	NPort 5650-8-S-SC	–	–	–	–	–
	NPort 5610-8-DT	–	–	–	–	–
	NPort 5610-8-DT-J	–	–	–	–	–
	NPort 5650-8-DT	–	–	–	–	–
	NPort 5650-8-DT-J	–	–	–	–	–
	NPort 5650I-8-DT	–	–	–	–	–
	NPort 5610-8-DTL	–	–	–	–	–
	NPort 5650-8-DTL	–	–	–	–	–
	NPort 5650I-8-DTL	–	–	–	–	–
16 Ports	NPort 5610-16	–	–	–	–	–
	NPort 5630-16	–	–	–	–	–
	NPort 5650-16	–	–	–	–	–

Barrel Plug Type		Locking Barrel Plug						
O/P		12 VDC 2 A, 100 to 240 VAC (desktop type)	10A/250V Power Cord, 183 cm					
Plug Type		Must accompany with one power cord	US	JP	EU	AU	UK	CN
Appearance								
Model Name		PWR-12200-DT-S1	PWC-C13US-3B-183	PWC-C13JP-3B-183	PWC-C13EU-3B-183	PWC-C13AU-3B-183	PWC-C13UK-3B-183	PWC-C13CN-3B-183
4 Ports	NPort 5410	–	–	–	–	–	–	–
	NPort 5430	–	–	–	–	–	–	–
	NPort 5430I	–	–	–	–	–	–	–
	NPort 5450	–	–	–	–	–	–	–
	NPort 5450I	–	–	–	–	–	–	–
8 Ports	NPort 5610-8	–	✓	✓	✓	✓	✓	✓
	NPort 5630-8	–	✓	✓	✓	✓	✓	✓
	NPort 5650-8	–	✓	✓	✓	✓	✓	✓
	NPort 5650-8-M-SC	–	✓	✓	✓	✓	✓	✓
	NPort 5650-8-S-SC	–	✓	✓	✓	✓	✓	✓
	NPort 5610-8-DT	✓	✓	✓	✓	✓	✓	✓
	NPort 5610-8-DT-J	✓	✓	✓	✓	✓	✓	✓
	NPort 5650-8-DT	✓	✓	✓	✓	✓	✓	✓
	NPort 5650-8-DT-J	✓	✓	✓	✓	✓	✓	✓
	NPort 5650I-8-DT	✓	✓	✓	✓	✓	✓	✓
	NPort 5610-8-DTL	✓	✓	✓	✓	✓	✓	✓
	NPort 5650-8-DTL	✓	✓	✓	✓	✓	✓	✓
	NPort 5650I-8-DTL	✓	✓	✓	✓	✓	✓	✓
16 Ports	NPort 5610-16	–	✓	✓	✓	✓	✓	✓
	NPort 5630-16	–	✓	✓	✓	✓	✓	✓
	NPort 5650-16	–	✓	✓	✓	✓	✓	✓



Embedded Device Servers

Product Selection Guide

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Embedded Device Servers

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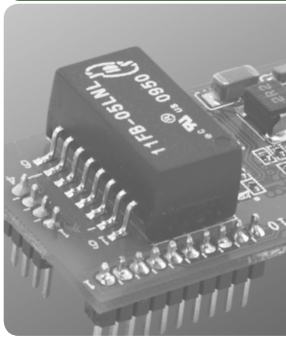
MiiNePort E3 Series: 10/100 Mbps embedded serial device servers with RJ45 11-11
MiiNePort W1 Series: Wireless LAN embedded serial device servers 11-14



Embedded Device Servers

		MiiNePort E2/E2-T MiiNePort E2-H/E2-H-T	MiiNePort E3/E3-T MiiNePort E3-H/E3-H-T	MiiNePort W1 MiiNePort W1-T
Form Factor				
Type		Drop-in module	Pin-header module	Drop-in module
Physical Characteristics				
Dimensions		29 x 17 x 12.6 mm (1.14 x 0.67 x 0.50 in)	35 x 52.5 x 18 mm (1.38 x 2.07 x 0.71 in)	44.4 x 44.4 x 9.7 mm (1.75 x 1.75 x 0.38 in)
Weight		5 g (0.01 lb)	12 g (0.03 lb)	15.35 g (0.03 lb)
Ethernet Interface				
10/100BaseT(X) Ports		1	1	1
Connector		4-pin pin header	RJ45	–
Magnetic Isolation Protection		1.5 kV	1.5 kV	–
WLAN Interface				
Standard Compliance		–	–	IEEE 802.11b/g
Radio Frequency Type		–	–	DSSS, CCK, OFDM
Wireless Security		–	–	AES, WEP, WPA, WPA2, PSK, 802.11i
Network Modes		–	–	Infrastructure mode (b/g), Ad-Hoc mode (b/g)
Serial Interface				
TTL Ports		1 (data port)	1 (data port)	1 (data port)
Serial Communication Parameters		Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark		Data Bits: 7, 8; Stop Bits: 1, 2; Parity: None, Even, Odd
Flow Control		RTS/CTS, DTR/DSR, XON/XOFF		RTS/CTS, XON/XOFF
Baudrate		MiiNePort E2: 50 bps to 230.4 kbps MiiNePort E2-H: 50 bps to 921.6 kbps (nonstandard baudrates supported)	MiiNePort E3: 50 bps to 230.4 kbps MiiNePort E3-H: 50 bps to 921.6 kbps (nonstandard baudrates supported)	50 bps - 921.6 kbps
Programmable GPIO Pins		4	4	8
Software				
Network Protocols		ICMP, ARP, IPv4, TCP, UDP, DHCP, HTTP, SNMP V1, SMTP, TFTP, Auto IP, Telnet, BOOTP		ICMP, IP, TCP, UDP, DHCP, Telnet, DNS, SNMP V1/V2c/V3, HTTP, SMTP, SNTP, SSH, HTTPS, ARP
Configuration Options		Web/Serial/Telnet Console, Windows Search Utility		
Serial Command Mode		✓	✓	✓
Windows Real COM Drivers		Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded		
Fixed TTY Drivers		SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X		
Linux Real TTY Drivers		Linux 2.4.x, 2.6.x, 3.x		
Operation Modes		TCP Server, TCP Client, UDP, Real COM, Ethernet Modem, RFC2217		Real COM, TCP Server, TCP Client, UDP, RFC2217
NetEZ Technology		EZPower, EZPage, SCM, AutoCFG, MCSC	EZPower, EZPage, SCM, AutoCFG	SCM
Environmental Limits				
Operating Temperature	Standard Temperature	0 to 55°C (32 to 131°F)		
	Wide Temperature	-40 to 85°C (-40 to 185°F)		-40 to 75°C (-40 to 167°F)
Ambient Relative Humidity		5 to 95% (non-condensing)		
Storage Temperature (package included)		-40 to 60°C (-40 to 140°F)		
Power Requirement				
Input Voltage		3.3 to 5 VDC	3.3 to 5 VDC	3.3 to 5 VDC
Input Current		140 mA @ 3.3 VDC	157 mA @ 3.3 VDC	400 mA @ 3.3 VDC
Standards and Certifications				
Safety		–	–	UL 60950-1
EMC		EN 55022/24	EN 55022/24	EN 55022/24
EMI		CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class A
EMS		IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 0.5 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11
Radio		–	–	EN 300 328, EN 301 489, EN 62311 (US), DSPR (Japan)
Reliability				
Watchdog Timer		✓	✓	✓
MTBF		Time: 5,696,350 hrs Standard: Telcordia (Bellcore) SR-332	Time: 3,608,031 hrs Standard: Telcordia (Bellcore) SR-332	Time: 441,378 hrs Standard: Telcordia (Bellcore) SR-332
Warranty		5 years (see www.moxa.com/warranty)		
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Embedded Device Servers Software Development Kit

		MiiNePort E2-SDK
Software		
OS		eCos
Software Development Tool		MiiNePort-IDE
Search/Upload Firmware Utility		Windows Search Utility
Wizard		Project/SNMP/CLI(Telnet)/SCM/User Configuration
Windows Real COM Drivers		Windows 98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/10 (x86/x64), 2012 x64, Embedded CE 5.0/6.0, XP Embedded
Fixed TTY Drivers		SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x
Linux Real TTY Drivers		Linux kernel 2.4.x, 2.6.x, 3.x
Operation Modes		Real COM, Ethernet Modem
Serial/Ethernet Testing Tool		PComm Lite
Serial/Ethernet Sample Source Code		1. TCP Server Echo 2. TCP Server: Serial (single connection) 3. TCP Server: Serial (multiple connections) 4. TCP Client Echo 5. TCP Client: Serial (startup) 6. TCP Client: Serial (any character) 7. TCP Client: Serial (designated destination TCP/IP port from serial) 8. UDP echo 9. UDP-to-serial
Physical Characteristics		
Dimensions		29 x 22.8 x 14.5 mm (1.14 x 0.9 x 0.57 in)
Weight		3.16 g (0.01 lb)
Environmental Limits		
Operating Temperature	Standard Temperature	0 to 55°C (32 to 131°F)
Ambient Relative Humidity		5 to 95% (non-condensing)
Storage Temperature (package included)		-40 to 60°C (-40 to 140°F)
Power Requirements		
Input Voltage		3.3 to 5 VDC
Input Current		140 mA @ 3.3 VDC
Standards and Certifications		
Safety		–
EMC		EN 55022/24
EMI		CISPR 22, FCC Part 15B Class B
EMS		IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 0.5 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11
Reliability		
Watchdog Timer		✓
MTBF		Time: 2,463,960 hrs Standard: Telcordia (Bellcore) TR/SR
Warranty		5 years (see www.moxa.com/warranty)
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Go Ethernet with Thumb-Sized Serial-to-Ethernet Solutions

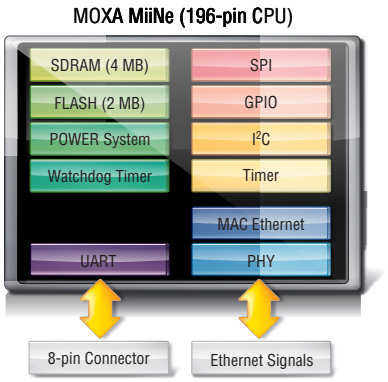
Are you concerned about cost, design flexibility, and power consumption? Moxa understands what you need! To serve this demand, Moxa developed the MiiNePort series family, the world's tiniest and most innovative embedded serial-to-Ethernet device server.

Moxa's MiiNePort series embedded device servers are designed for manufacturers who want to add sophisticated network connectivity to their serial devices with minimal integration effort.

The MiiNe is a Lean yet Powerful Serial-to-Ethernet Solution

Moxa's second generation SoC, the MiiNe, was created to provide device manufacturers with a competitive embedded serial-to-Ethernet solution. The MiiNePort embedded device server, which uses the MiiNe for its SoC, is the world's tiniest embedded device server and has the lowest power consumption among similar products. The MiiNe SoC has the following features:

- Designed for 1 or 2-port serial-to-Ethernet applications
- Uses a 32-bit ARM core
- Uses Moxa's advanced UART technology
- Has 2 MB Flash and 4 MB SDRAM memory built in



Powered by the MiiNe, Moxa's 2nd generation SoC, the MiiNePort makes your device more powerful and cost-effective.

As the world's smallest serial-to-Ethernet module, the thumb-sized MiiNePort maximizes your design flexibility.

Want to minimize the power consumption of your device while maximizing its strength? The MiiNePort can help.

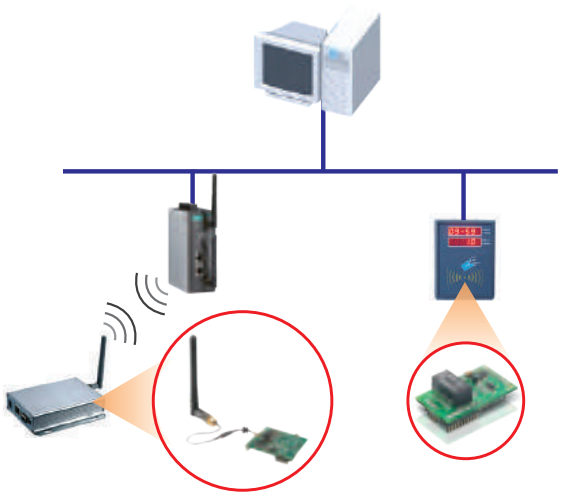
NetEZ™

Moxa's NetEZ technology gives serial device manufacturers a range of powerful tools for integrating Ethernet capability into serial devices.

Introduction to Embedded Device Servers

Embedded device servers give serial device manufacturers a cost-effective means of making serial devices network-ready. Moxa provides a wide range of embedded device servers with products available to provide either wired or wireless Ethernet communication capability. With Moxa's embedded device servers, device manufactures can easily turn their legacy serial devices into network devices with a minimum of investment and effort. In fact, since TCP/IP expertise is not required, time-to-market can be reduced to the three- to six-month range. Compared with other solutions on the market, Moxa's embedded device server products give serial device manufacturers ready access to a unique set of features:

- Different form factors for different installation types
- Versatile, ready-to-use operation modes
- Thumb-sized footprint minimizes overall device size
- Low power consumption maximizes device system stability
- NetEZ technology makes device manufacturers' job and life easier



Different form factors for different installation types

Drop-in Form Factor: Drop-in modules come with DIP pins or pin headers to make assembly easy. This kind of module has a smaller footprint and it is perfect for device manufacturers who have size concerns for their devices.

Moxa's Drop-in Modules: MiiNePort E2, MiiNePort W1.

Stand-alone Form Factor: Stand-alone modules come with pin headers and screw mounting holes for device manufacturers to connect and fix the modules to the device's mainboard. This kind of module has a bigger footprint compared to the drop-in form factor, but it still provides sufficient flexibility for placing the module in the device without making large changes to the device's original mainboard design.

Moxa Stand-alone Modules: MiiNePort E3.

NetEZ Technology

NetEZ™ It's That Easy! SCM | AutoCFG | MCSC | EZPower | EZPage

Moxa's NetEZ technology gives serial device manufacturers a range of powerful tools for integrating Ethernet capability into serial devices:

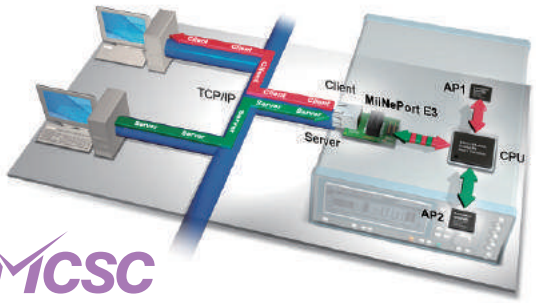
- **EZPage:** Need a module that allows direct communication with the attached serial device? Use the MiiNePort's EZPage Java Applet to create a visual web page for configuring and communicating with the attached serial device.

EZPage

- **EZPower:** Need a module that provides a versatile system power input voltage? Use the MiiNePort's EZPower to switch automatically between a 3.3 and 5 VDC system power input.

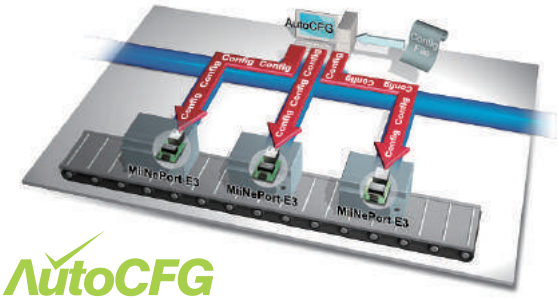
EZPower

- **MCSC:** Ever wanted your device to be a server and client at the same time? The MiiNePort's MCSC (Multi-channel Serial Communication) provides dual connections and dual channels for multitask applications.



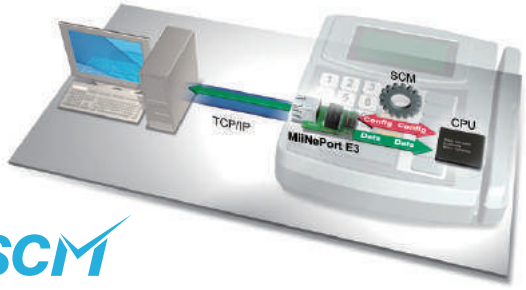
MCSC

- **AutoCFG:** Tired of spending a large amount of time and effort setting up a network? Not anymore! The MiiNePort's AutoCFG makes auto-configuration during manufacturing possible.



AutoCFG

- **SCM:** Need an easy tool to configure the network through serial communication inside the device? Try MiiNePort's friendly SCM (Serial Command Mode).

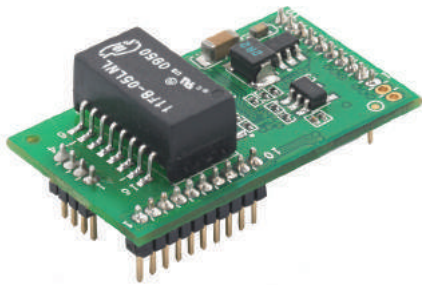


SCM

MiiNePort E2 Series

Award-winning Product
TAIWAN EXCELLENCE 2013

10/100 Mbps embedded serial device servers



- Smallest embedded device server available—only 29 x 17 x 12.6 mm
- EZPower for 3.3 to 5 VDC system power input supported
- Extremely low power consumption
- Uses the MiiNe, Moxa's second generation SoC
- Simple integration with NetEZ technology
- Operation versatility with Real COM/TCP/UDP/RFC2217/MCSC

Overview

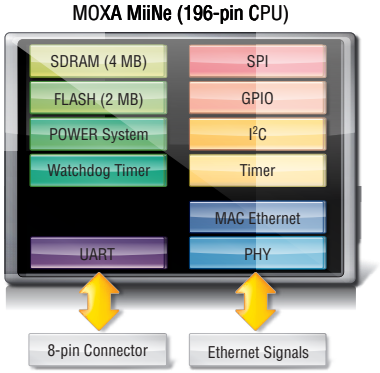
Moxa's MiiNePort E2 series embedded device servers are designed for manufacturers who want to add sophisticated network connectivity to their serial devices with minimal integration effort. The MiiNePort E2 is empowered by the MiiNe, Moxa's second generation SoC, which supports 10/100 Mbps Ethernet, delivers a serial baudrate of up to 921.6 kbps, offers a versatile selection of ready-to-use operation modes, and requires a minimal amount of power. With Moxa's innovative NetEZ technology, the MiiNePort E2 can convert any device with a standard serial interface to an Ethernet-enabled device. In addition, the MiiNePort E2 is the smallest embedded device server without an RJ45 connector, making it easy to fit into virtually any existing serial device.

The MiiNe—Moxa's 2nd Generation SoC

MiiNe The MiiNe was created to provide manufacturers with a competitive embedded serial-to-Ethernet solution. The MiiNePort E2, which uses the MiiNe for its SoC, is one of the world's tiniest embedded device servers and has the lowest power consumption among similar products. The MiiNe's features include:

- Cost-effective serial-to-Ethernet conversions
- ARM core
- Advanced UART technology
- Internal 2 MB Flash and 4 MB SDRAM memory

MOXA MiiNe (196-pin CPU)



Specifications

Form Factor
Type: Drop-in module
Dimensions: 29 x 17 x 12.6 mm (1.14 x 0.67 x 0.50 in)
Weight: 5 g (0.01 lb)

System Information
CPU: 32-bit ARM Core
RAM: 4 MB built in
Flash: 2 MB built in

Ethernet Interface
Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface
Number of Ports: 1
Transmission Format: Standard TTL

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, DTR/DSR, XON/XOFF
Baudrate:
MiiNePort E2: 50 bps to 230.4 kbps
MiiNePort E2-H: 50 bps to 921.6 kbps
Note: Non-standard baudrates supported

Serial Signals
TTL: TxD, RxD, RTS, CTS, DTR, DSR, DCD, RST (reset circuit), GND

Digital I/O Pins
GPIO: 4 configurable I/O pins

Software

Network Protocols: ICMP, ARP, IPv4, TCP, UDP, DHCP, HTTP, SNMP V1, SMTP, TFTP, Auto IP, Telnet, BOOTP
Configuration Options: Web Console, Serial Console (Serial Command Mode), Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X
Linux Real TTY Drivers: Linux 2.4.x, 2.6.x, 3.x
Operation Modes: Real COM, TCP Server, TCP Client, UDP, Ethernet Modem, RFC2217, MCSC
NetEZ Function: EZPower, EZPage, SCM (Serial Command Mode), AutoCFG, MCSC (Multi-channel Serial Communication)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature (package included): -40 to 60°C (-40 to 140°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 3.3 to 5 VDC
Input Current: 157 mA @ 3.3 VDC

Standards and Certifications

EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power 1 kV; Signal 0.5 kV
IEC 61000-4-5 Surge: Power 2 kV; Signal: 0.5 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11
Vibration: IEC 60068-2-6, 5-25.7 Hz: ±15 mm; 25.7-500 Hz: 20g; 3 hours/axis
Shock: IEC 60068-2-27, 500g/2ms
Drop: IEC 60068-2-34
IEC 60068-2-32, ISTA-2A

Reliability

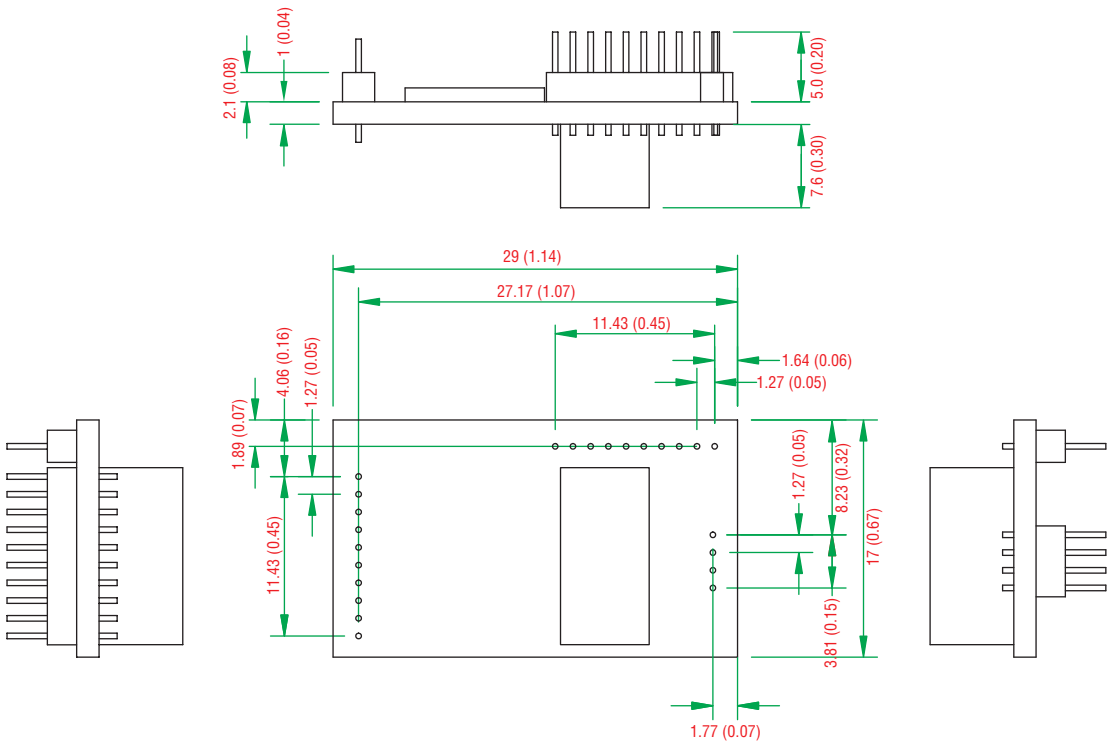
MTBF (mean time between failures):
Time: 5,696,350 hrs
Standard: Telcordia (Bellcore) SR-332

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

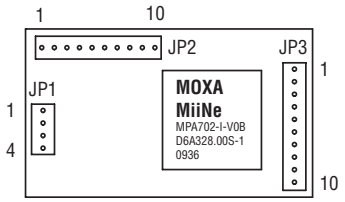
Dimensions

Unit: mm (inch)



Pin Assignment

JP1			JP2			JP3		
Pin	Signal Name	Function	Pin	Signal Name	Function	Pin	Signal Name	Function
1	Ethernet Tx+	Ethernet Transmit Data+	1	100M LED	Ethernet 100M LED	1	DIO0	Programmable Input/Output
2	Ethernet Tx-	Ethernet Transmit Data-	2	10M LED	Ethernet 10M LED	2	DIO2	Programmable Input/Output
3	Ethernet Rx+	Ethernet Receive Data+	3	LRXD	Receive Serial Data	3	DIO3	Programmable Input/Output
4	Ethernet Rx-	Ethernet Receive Data-	4	LTXD	Transmit Serial Data	4	DIO1	Programmable Input/Output
			5	LDCD	Data Carrier Detect	5	Reserved	N/A
			6	RS485_EN	RS-485 Enable	6	Reserved	N/A
			7	LRTS	Request To Send	7	SW_Reset	Reset to Factory Default
			8	LDTR	Data Terminal Ready	8	GND	Circuit Ground
			9	LDSR	Data Set Ready	9	Ready LED	System is Ready LED
			10	LCTS	Clear To Send	10	VCC	Power Supply



Ordering Information

Available Modules

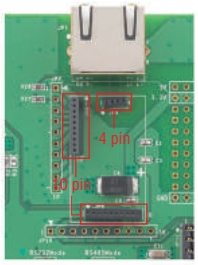
MiiNePort E2: Embedded device server for TTL devices, drop-in module, 10/100M without RJ45 connector, 50 bps to 230.4 kbps baudrate, 0 to 55°C operating temperature
MiiNePort E2-H: Embedded device server for TTL devices, drop-in module, 10/100M without RJ45 connector, 50 bps to 921.6 kbps baudrate, 0 to 55°C operating temperature
MiiNePort E2-T: Embedded device server for TTL devices, drop-in module, 10/100M without RJ45 connector, 50 bps to 230.4 kbps baudrate, -40 to 85°C operating temperature
MiiNePort E2-H-T: Embedded device server for TTL devices, drop-in module, 10/100M without RJ45 connector, 50 bps to 921.6 kbps baudrate, -40 to 85°C operating temperature

Available Starter Kits

MiiNePort E2-ST: Starter kit for the MiiNePort E2 Series, module included
MiiNePort E2-H-ST: Starter kit for the MiiNePort E2-H Series, module included

Optional Accessories (can be purchased separately)

PWR-12125-DT-S1: Desktop power supply (requires power cord), 12 VDC, 1.25 A, 100 to 240 VAC
PWC-C7US-2B-183: 10A/125V US power cord, 183 cm
PWC-C7EU-2B-183: 2.5A/250V Continental European (EU) power cord, 183 cm
CBL-F9M9-150: DB9 female to DB9 male serial cable, 150 cm
CBL-RJ458P-100: 8-pin RJ45 CAT5 Ethernet cable, 100 cm
Female Socket Connectors: Includes one 1x4 DIP, two 1x10 DIP



Female Socket Connectors

Package Checklist (modules)

- MiiNePort E2 module

Package Checklist (starter kits)

- MiiNePort E2 module
- MiiNePort E2 evaluation board
- Universal power adapter
- Power Cord: PWC-C7US-2B-183
- Power Cord: PWC-C7EU-2B-183
- Serial Cable: CBL-F9M9-150
- Ethernet Cable: CBL-RJ458P-100
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

MiiNePort E2-SDK

MiiNePort E2 software development kit

- Eclipse-based integrated software development tool
- Source level debugger
- Various serial-to-Ethernet sample codes
- Mass production tool for easy firmware upload
- Support Real COM mode operation functions

Overview

MiiNePort E2-SDK is a powerful and versatile software suite for proprietary firmware development on the MiiNePort E2. To expedite time-to-market, the MiiNePort E2-SDK provides comprehensive tools for development, testing, and mass production. The software development kit includes:

MiiNePort-IDE—integrated platform for development of serial-to-Ethernet firmware.

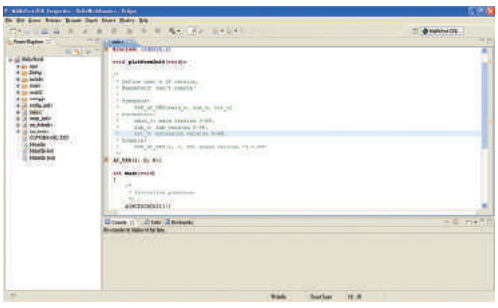
PComm Lite—software application for testing serial and TCP/IP communication/transmission.

Search Utility—search-and-update firmware utility for mass production of modules and serial devices through simultaneous multiple-unit configurations.

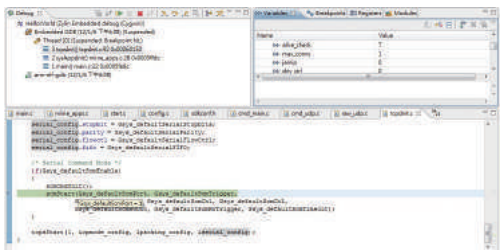
MiiNePort–IDE (Eclipse-based Software Development Tool)

The MiiNePort-IDE is an Eclipse-based platform which includes a powerful source code editor, C/C++ compiler, and source-level debugger tool. The MiiNePort-IDE also offers wizard assistance for step-by-step development of SNMP, Telnet, configuration, and application functions. In addition, serial-to-Ethernet sample codes are provided for reference to assist in firmware development. For complex operating modes, such as RealCOM and Ethernet modem, MiiNePort-IDE offers ready-to-run firmware with minimal configuration required.

Friendly Interface



Source-Level Debugging



Specifications

System Information

CPU: 32-bit ARM Core
RAM: 4 MB built in
Flash: 2 MB built in

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface
Number of Ports: 1
Transmission Format: Standard TTL

Digital I/O Pins
GPIO: 4 configurable I/O pins

Software
OS: eCos
Software Development Tool: MiiNePort-IDE
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X
Linux Real TTY Drivers: Linux 2.4.x, 2.6.x, 3.x
Operation Modes: Real COM, Ethernet Modem
Wizard: Project/SNMP/CLI(Telnet)/SCM/User Configuration
Serial/Ethernet Test Tool: PComm Lite (Serial/TCP Server/TCP Client)
Search/Upload Firmware Utility: NPort Search Utility

Serial to Ethernet Sample Source Code
(Integrated in MiiNePort-IDE):
1. TCP Server Echo
2. TCP Server to Serial (Single connection)
3. TCP Server to Serial (Multi-connection)
4. TCP Client Echo
5. TCP Client to Serial (Startup)
6. TCP Client to Serial (Any character)
7. TCP Client to Serial (Designed destination TCP/IP port from serial)
8. UDP echo
9. UDP to serial

Environmental Limits
Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature (package included): -40 to 60°C (-40 to 140°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

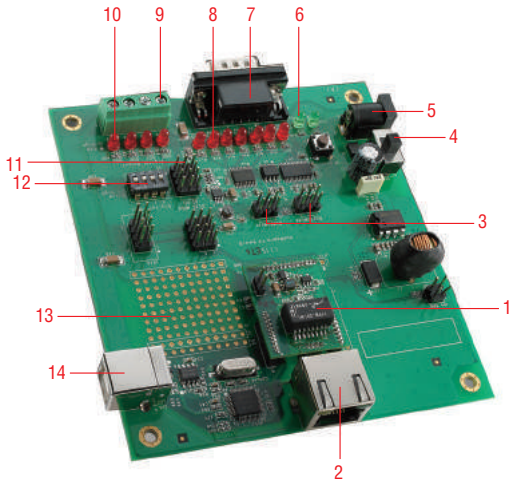
Power Requirements
Input Voltage: 3.3 to 5 VDC
Input Current: 140 mA @ 3.3 VDC

Standards and Certifications
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power 1 kV; Signal 0.5 kV
IEC 61000-4-5 Surge: Power 2 kV; Signal: 0.5 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11
Drop: IEC 60068-2-34
IEC 60068-2-32, ISTA-2A

Reliability
MTBF (mean time between failures):
Time: 2,463,960 hrs
Standard: Telcordia (Bellcore) TR/SR

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Hardware Evaluation Board



Number	Description
1	MiiNePort E2-SDK Module, 2 MB Flash and 4 MB RAM built in
2	10/100M Ethernet RJ45 Connector
3	Serial Interface Jumper
4	Power Switch
5	Power Jack, 12 to 48 VDC
6	Power & Ready LED
7	RS-232 DB9 Male Connector
8	Serial Port Status LED
9	Digital IO Terminal Block
10	Digital Output LED
11	Digital Input/Output Mode
12	Digital Input Switch
13	Circuit Pad
14	USB Type B Connector (Debug)

Ordering Information

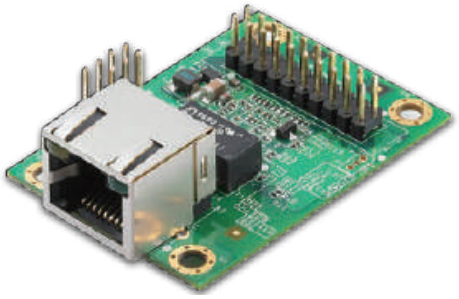
Available Modules
MiiNePort E2-SDK: Software development kit for the MiiNePort E2 Series, MiiNePort E2 module included
Note: For a list of applicable modules available for order, please refer to the MiiNePort E2 datasheet.

Optional Accessories (can be purchased separately)
PWR-12125-DT-S1: Desktop power supply (requires power cord), 12 VDC, 1.25 A, 100 to 240 VAC
PWC-C7US-2B-183: 10A/125V US power cord, 183 cm
PWC-C7EU-2B-183: 2.5A/250V Continental European (EU) power cord, 183 cm
CBL-F9M9-150: DB9 female to DB9 male serial cable, 150 cm
CBL-RJ458P-100: 8-pin RJ45 CAT5 Ethernet cable, 100 cm
CBL-USBA/B-100: USB Type A to USB Type B cable, 100 cm

Package Checklist
- MiiNePort E2-SDK module
- MiiNePort E2-SDK evaluation board
- Universal power adapter
- Power Cord: PWC-C7US-2B-183
- Power Cord: PWC-C7EU-2B-183
- USB Cable: CBL-USBA/B-100
- Serial Cable: CBL-F9M9-150
- Ethernet Cable: CBL-RJ458P-100
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

MiiNePort E3 Series

10/100 Mbps embedded serial device servers



- IEEE 802.3af compliant PoE pass-through
- Use Moxa's high quality and reliable second generation MiiNe SoC
- Versatile choice of operation modes fulfill specific application requirements
- Green design with extremely low power consumption
- MiiNePort NetEZ Technology makes integration incredibly easy
- Highly compact embedded device module

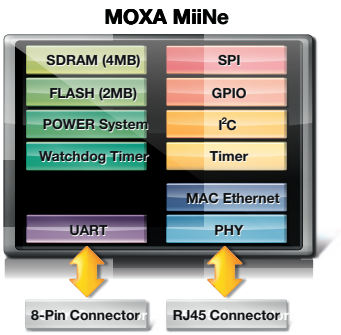
Overview

Moxa's MiiNePort E3 series embedded device servers are designed for manufacturers who want to add sophisticated network connectivity to their serial devices with minimal integration effort. The MiiNePort E3 is empowered by the MiiNe, Moxa's second generation SoC, which supports 10/100 Mbps Ethernet, up to 921.6 kbps serial baudrate, a versatile selection of ready-to-use operation modes, and requires only a small amount of power. By using Moxa's innovative NetEZ technology, the MiiNePort E3 can be used to convert any device with a standard serial interface to an Ethernet-enabled device in no time. In addition, the MiiNePort E3 is a compact embedded device server with an RJ45 connector, making it easy to fit into virtually any existing serial device.

The MiiNe—Moxa's 2nd Generation SoC

MiiNe The MiiNe was created to provide manufacturers with a competitive embedded serial-to-Ethernet solution. The MiiNePort E3, which uses the MiiNe for its SoC, is a compact embedded device server that has the lowest power consumption among similar products. The MiiNe has the following features:

- Designed for serial-to-Ethernet applications
- Uses an ARM core
- Uses Moxa's own advanced UART technology
- 2 MB Flash and 4 MB SDRAM memory built in



Specifications

Form Factor
Type: Pin header module
Dimensions: 35 x 52.5 x 18 mm (1.38 x 2.07 x 0.71 in)
Weight: 12 g (0.03 lb)

System Information
CPU: 32-bit ARM Core
RAM: 4 MB built in
Flash: 2 MB built in

Ethernet Interface
Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: RJ45 (magnetic)
Magnetic Isolation Protection: 1.5 kV built-in
LEDs: 10BASE-T & 100BASE-TX Link Activity
PoE Pass-through: 802.3af compliant

Serial Interface
Number of Ports: 1
Transmission Format: Standard TTL

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, DTR/DSR, XON/XOFF
Baudrate:
MiiNePort E3: 50 bps to 230.4 kbps
MiiNePort E3-H: 50 bps to 921.6 kbps
Note: Non-standard baudrates supported

Serial Signals
TTL: TxD, RxD, RTS, CTS, DTR, DSR, DCD, RST (reset circuit), GND

Digital I/O Pins

GPIO: 4 configurable I/O pins

Software

Network Protocols: ICMP, ARP, IPv4, TCP, UDP, DHCP, HTTP, SNMP V1, SMTP, TFTP, Auto IP, Telnet, BOOTP
Configuration Options: Web Console, Serial Console (Serial Command Mode), Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X
Linux Real TTY Drivers: Linux 2.4.x, 2.6.x, 3.x
Operation Modes: Real COM, TCP Server, TCP Client, UDP, Ethernet Modem, RFC2217
NetEZ Function: EZPower, EZPage, SCM (Serial Command Mode), AutoCFG

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature (package included): -40 to 60°C (-40 to 140°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 3.3 to 5 VDC
Input Current: 157 mA @ 3.3 VDC

Standards and Certifications

EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power 1 kV; Signal 0.5 kV
IEC 61000-4-5 Surge: Power 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11
Vibration: IEC 60068-2-6, 5-25.7 Hz: ±15 mm; 25.7-500 Hz: 20g; 3 hours/axis
Shock: IEC 60068-2-27, 500g/2ms
Drop: IEC 60068-2-34
IEC 60068-2-32, ISTA-2A

Reliability

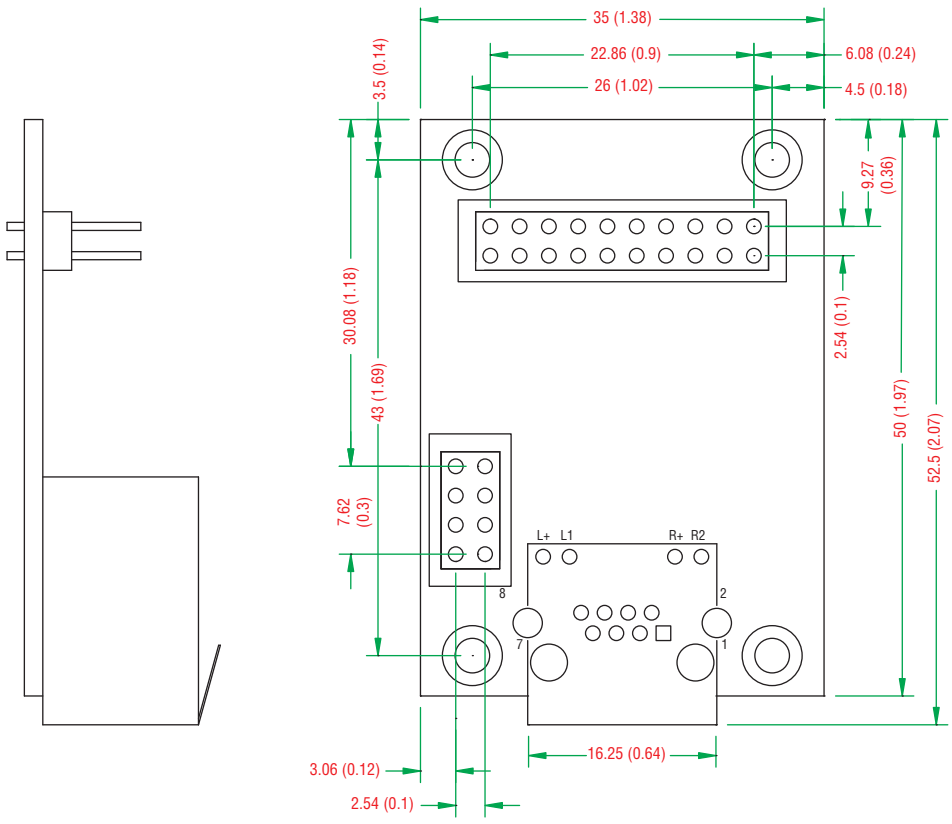
MTBF (mean time between failures):
Time: 3,608,031 hrs
Standard: Telcordia (Bellcore) TR/SR

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

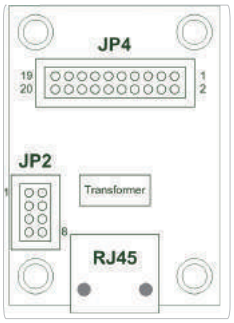
Dimensions

Unit: mm (inch)



Pin Assignment

Ethernet Pins (JP2)			Serial Pins and Power Pins (JP4)					
Pin	Signal Name	Function	Pin	Signal Name	Function	Pin	Signal Name	Function
1	Reserve	N/A	1	Serial Rx	Receive Serial Data	11	DTR	Data Terminal Ready
2	Reserve	N/A	2	Ready LED	System To Ready LED	12	Reserve	N/A
3	Reserve	N/A	3	Serial Tx	Transmit Serial Data	13	LDSR	Data Set Ready
4	Reserve	N/A	4	GPIO	Programmable I/O	14	Reserve	N/A
5	POE signal pair 1	PoE Power from Tx signal	5	LDCD	Data Carrier Detect	15	LCTS	Clear To Send
6	POE spare pair 1	PoE Power from RJ45 4, 5 pin	6	GPIO	Programmable I/O	16	SW_Reset	Reset to factory default
7	POE signal pair 2	PoE Power from Rx signal	7	RS485_ EN0	RS-485 Enable	17	Reserve	N/A
8	POE spare pair 2	PoE Power from RJ45 7, 8 pin	8	GPIO	Programmable I/O	18	Reserve	N/A
			9	LRTS	Request To Send	19	GND	Circuit Ground
			10	GPIO	Programmable I/O	20	VCC	Power Supply



Ordering Information

Available Modules

MiiNePort E3: Embedded device server for TTL devices, pin header module, 10/100M with RJ45 connector, 50 bps to 230.4 kbps baudrate, 0 to 55°C operating temperature
MiiNePort E3-H: Embedded device server for TTL devices, pin header module, 10/100M with RJ45 connector, 50 bps to 921.6 kbps baudrate, 0 to 55°C operating temperature
MiiNePort E3-T: Embedded device server for TTL devices, pin header module, 10/100M with RJ45 connector, 50 bps to 230.4 kbps baudrate, -40 to 85°C operating temperature
MiiNePort E3-H-T: Embedded device server for TTL devices, pin header module, 10/100M with RJ45 connector, 50 bps to 921.6 kbps baudrate, -40 to 85°C operating temperature

Available Starter Kits

MiiNePort E3-ST: Starter kit for the MiiNePort E3 Series, module included
MiiNePort E3-H-ST: Starter kit for the MiiNePort E3-H Series, module included

Optional Accessories (can be purchased separately)

PWR-12125-DT-S1: Desktop power supply (requires power cord), 12 VDC, 1.25 A, 100 to 240 VAC
PWC-C7US-2B-183: 10A/125V US power cord, 183 cm
PWC-C7EU-2B-183: 2.5A/250V Continental European (EU) power cord, 183 cm
CBL-F9M9-150: DB9 female to DB9 male serial cable, 150 cm
CBL-RJ458P-100: 8-pin RJ45 CAT5 Ethernet cable, 100 cm
Assembly Pack: 8 screws and 4 spacers
8-pin Straight Cable: For connecting module and evaluation board
20-pin Straight Cable: For connecting module and evaluation board

Package Checklist (modules)

- MiiNePort E3 module

Package Checklist (starter kits)

- MiiNePort E3 module
- MiiNePort E3 evaluation board
- Universal power adapter
- Power Cord: PWC-C7US-2B-183
- Power Cord: PWC-C7EU-2B-183
- Serial Cable: CBL-F9M9-150
- Ethernet Cable: CBL-RJ458P-100
- Assembly pack (8 screws & 4 spacers)
- 8-pin straight cable (connect module and evaluation board)
- 20-pin straight cable (connect module and evaluation board)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

MiiNePort W1 Series

Wireless LAN embedded serial device servers

Antenna ordered separately

- IEEE 802.11 b/g compatible
- AES, WEP 64/128-bit, WPA, WPA2, PSK, 802.11i security support
- Low power consumption (1.18W)
- 1 serial port, up to 921.6 kbps
- 1 Ethernet port, 10/100 Mbps
- HTTPS/SSH support for configuration
- Fast roaming to enhance connection reliability

Overview

The MiiNePort W1 series provides serial to IEEE 802.11 b/g embedded wireless solution with compact size and ultra low power consumption features. Numerous operation modes are designed to fulfill the requirements of embedded module application. Complete driver support reduces software redesign effort and accelerate time to market.

Specifications

Form Factor
Type: Drop-in module
Dimensions: 44.4 x 44.4 x 9.7 mm (1.75 x 1.75 x 0.38 in)
Weight: 15.35 g (0.03 lb)

System Information
CPU: 32-bit ARM Core
RAM: 64 MB built in
Flash: 16 MB built in

Ethernet Interface
Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX

WLAN Interface
Standard Compliance: IEEE 802.11b/g
Network Modes: Infrastructure mode (b/g), Ad-Hoc mode (b/g)
Spread Spectrum Technology: DSSS, CCK, OFDM
Transmit Power:
IEEE 802.11b: 16 dBm (typical)
IEEE 802.11g: 14 dBm (typical)
Receive Sensitivity: -71 dBm (Min)
Transmission Rate:
IEEE 802.11b: 11 Mbps
IEEE 802.11g: 54 Mbps
Transmission Distance:
Up to 100 meters (in open areas)
Wireless Security:
AES, WEP 64/128-bit, WPA, WPA2, PSK, 802.11i

Serial Interface
Number of Ports: 1
Serial Standards: TTL

Serial Communication Parameters
Data Bits: 7, 8
Stop Bits: 1, 2
Parity: None, Even, Odd
Flow Control: RTS/CTS, XON/XOFF
Baudrate: 50 bps to 921.6 kbps

Serial Signals
TTL: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Digital I/O Pins
GPIO: 8 configurable I/O pins

Software
Network Protocols: ICMP, ARP, IPv4, TCP, UDP, DHCP, Telnet, DNS, SNMP V1/V2c/V3, HTTP, SMTP, SNTP, SSH, HTTPS
Configuration Options: Web Console, Serial Console (Serial Command Mode), Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows Embedded CE 5.0/6.0, Windows XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac OS X
Linux Real TTY Drivers: Linux 2.4.x, 2.6.x, 3.x
Operation Modes: Real COM, TCP Server, TCP Client, UDP, RFC2217

Environmental Limits
Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature (package included): -40 to 60°C (-40 to 140°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 3.3 to 5 VDC
Input Current: 400 mA @ 3.3 VDC

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power 1 kV; Signal 0.5 kV
IEC 61000-4-5 Surge: Power 1 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11
Vibration: IEC 60068-2-6, 5-25.7 Hz: ±15 mm; 25.7-500 Hz: 20g; 3 hours/axis
Shock: IEC 60068-2-27, 500g/2ms
Radio: EN 300 328, EN 301 489, EN62311 (US), DSPR (Japan)
Drop: IEC 60068-2-34
IEC 60068-2-32, ISTA-2A

Reliability

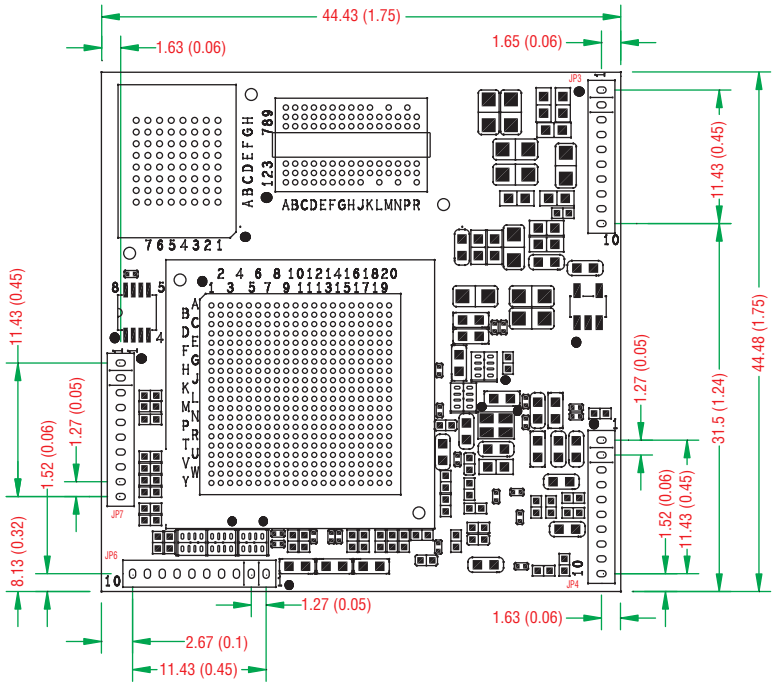
Automatic Reboot Trigger: Built-in WDT (watchdog timer)
MTBF (mean time between failures):
Time: 441,378 hrs
Standard: Telcordia (Bellcore) TR/SR

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

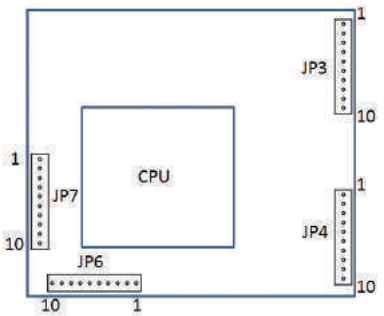
Dimensions

Unit: mm (inch)



Pin Assignment

Pin	JP3	JP4	JP6	JP7
1	N.C.	Eth_10M_LED	PIO0	LTXD0
2	N.C.	Eth_100M_LED	PIO1	LRTS0
3	N.C.	Eth_Rx+	PIO2	LDTR0
4	RDY_LED	Eth_Rx-	PIO3	LRXD0
5	FLT_LED	Eth_center_tap	PIO4	LCTS0
6	HW_RESET	Eth_center_tap	PIO5	LDSR0
7	SW_RESET	Eth_Tx+	PIO6	LDCD0
8	WLAN_Link	Eth_Tx-	PIO7	N.C.
9	Vin	GND	LTXD1	LCTS1
10	Vin	GND	LRTS1	LRXD1



Ordering Information

Available Modules

MiiNePort W1: Embedded wireless device module supporting IEEE 802.11 b/g, 0 to 55°C operating temperature (internal antenna not included)
MiiNePort W1-T: Embedded wireless device module supporting IEEE 802.11 b/g, -40 to 75°C operating temperature (internal antenna not included)

Available Starter Kits

MiiNePort W1-ST: Starter kit for MiiNePort W1, module included

Optional Accessories (can be purchased separately)

PWR-12050-WPUSJP-S2: Non-locking barrel plug, 12 VDC, 0.5 A, 100 to 240 VAC with US/JP plug, 0 to 40°C
PWR-12050-WPEU-S2: Non-locking barrel plug, 12 VDC, 0.5 A, 100 to 240 VAC with Continental European (EU) plug, 0 to 40°C
PWR-12050-WPUK-S2: Non-locking barrel plug, 12 VDC, 0.5 A, 100 to 240 VAC with United Kingdom (UK) plug, 0 to 40°C
PWR-12150-CN-S1: Non-locking barrel plug, 12 VDC, 1.5 A, 100 to 240 VAC with China (CN) plug, 0 to 40°C
PWR-12050-WPAU-S2: Non-locking barrel plug, 12 VDC, 0.5 A, 100 to 240 VAC with Australian (AU) plug, 0 to 40°C
CBL-F9M9-150: DB9 female to DB9 male serial cable, 150 cm
CBL-RJ458P-100: 8-pin RJ45 CAT5 Ethernet cable, 100 cm
ANT-WDB-ARM-02: 2.4/5 GHz, dual-band omnidirectional antenna, 2 dBi, R-SMA (male), Dipole
CRF-MHF/SMA(M)-14.2: Mini1.13 cable, MHF to RP-SMA (female), 0.14 meters

ANT-WDB-ARM-02

CRF-MHF/SMA(M)-14.2

Package Checklist (modules)

- MiiNePort W1 series wireless module (Antenna ordered separately)

Package Checklist (starter kits)

- 1 MiiNePort W1 series wireless module
- MiiNePort W1 evaluation board
- Antenna: ANT-WDB-ARM-02
- Antenna: CRF-MHF/SMA(M)-14.2
- Serial Cable: CBL-F9M9-150
- Ethernet Cable: CBL-RJ458P-100
- 100 to 240 VAC power adapter (excluding T models)*
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

*The package includes one power adapter suitable for your region.

Multiport Serial Boards

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PCI Express Serial Boards

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CP-118U/138U: 8-port RS-232/422/485 Universal PCI serial boards 12-37
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ISA Serial Boards

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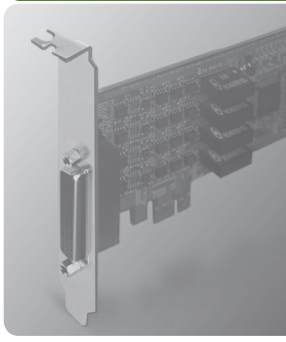
Multiport Serial Boards



PCI Express Serial Boards

	C320Turbo/PCIEL	CP-118EL-A	CP-168EL-A	CP-114EL	CP-114EL-I	CP-104EL-A	CP-102E
Hardware							
Comm. Controller	16C550C compatible						
Bus	PCI Express x1						
Connector	DB25 female	VHDCI 68		DB44 female			DB9 male
Serial Interface							
RS-232 Ports	32	–	8	–	–	4	2
RS-422/485 Ports	–	–	–	–	–	–	–
RS-232/422/485 Ports	–	8	–	4	4	–	–
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark						
Flow Control	RTS/CTS, XON/XOFF						
Baudrate	50 bps to 460.8 kbps	50 bps to 921.6 kbps					
Electrical Isolation	–	–	–	–	2 kV	–	–
Driver Support							
Windows 95/98/ME/NT	–	–	–	–	–	–	–
Windows 2000	✓	✓	✓	✓	✓	✓	✓
Windows XP/2003/Vista (x86/x64)	✓	✓	✓	✓	✓	✓	✓
Windows 2008 (x86/x64)	✓	✓	✓	✓	✓	✓	✓
Windows 7 (x86/x64)	✓	✓	✓	✓	✓	✓	✓
Windows 8/8.1(x86/x64)	✓	✓	✓	✓	✓	✓	✓
Windows 10 (x86/x64)	✓	✓	✓	✓	✓	✓	✓
Windows 2008 R2/2012/2012 R2 (x64)	✓	✓	✓	✓	✓	✓	✓
Windows CE 5.0	–	–	–	–	–	–	–
Windows CE 6.0	–	–	–	–	–	–	–
Windows XP Embedded	–	✓	✓	✓	✓	✓	✓
DOS	–	✓	✓	✓	✓	✓	✓
Linux 2.4.x, 2.6.x, 3.x	✓	✓	✓	✓	✓	✓	✓
FreeBSD 4/5	–	✓	✓	✓	✓	✓	✓
QNX 4.25	–	–	–	–	–	–	–
QNX 6	–	✓	✓	✓	✓	✓	✓
SCO Open Server	–	✓	✓	✓	✓	✓	✓
UnixWare 7	–	✓	✓	✓	✓	✓	✓
Environmental Limits							
Dimensions	67 x 135 mm (2.64 x 5.32 in)	68.9 x 88 mm (2.71 x 3.46 in)	64.42 x 102 mm (2.54 x 4.02 in)	67.21 x 103 mm (2.69 x 4.06 in)	67.21 x 135 mm (2.69 x 5.31 in)	67.21 x 103 mm (2.65 x 4.06 in)	85.04 x 100 mm (3.40 x 4.00 in)
Operating Temperature	0 to 55°C (32 to 131°F)						
Storage Temperature	-20 to 85°C (-4 to 185°F)						
Ambient Relative Humidity	5 to 95% (non-condensing)						
Standards and Certifications							
EMC	EN 55022/24	EN 55022/24	EN 55022/24	EN 55022/24	EN 55022/24	EN 55022/24	EN 55022/24
EMI	CISPR 22, FCC Part 15B Class A	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class A
EMS	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11					
Reliability							
MTBF	Time: 2,937,578 hrs Standard: Telcordia (Bellcore) TR/SR	Time: 1,359,482 hrs Standard: Telcordia (Bellcore) TR/SR	Time: 2,351,336 hrs Standard: Telcordia (Bellcore) TR/SR	Time: 2,347,197 hrs Standard: Telcordia (Bellcore) TR/SR	Time: 603,671 hrs Standard: Telcordia (Bellcore) TR/SR	Time: 3,601,447 hrs Standard: Telcordia (Bellcore) TR/SR	Time: 4,947,552 hrs Standard: Telcordia (Bellcore) TR/SR
Warranty	5 years (see www.moxa.com/warranty)						
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PCI Express Serial Boards

	CP-102EL	CP-132EL	CP-132EL-I	CP-116E-A	CP-118E-A-I	CP-138E-A-I	CP-134EL-A-I
Hardware							
Comm. Controller	16C550C compatible			16C550C compatible			
Bus	PCI Express x1			PCI Express x1			
Connector	DB25 female			VHDCI 68	DB78 Female	DB78 Female	DB44 Female
Serial Interface							
RS-232 Ports	2	–	–	–	–	–	–
RS-422/485 Ports	–	2	2	–	–	8	4
RS-232/422/485 Ports	–	–	–	16	8	–	–
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark			Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark			
Flow Control	RTS/CTS, XON/XOFF	XON/XOFF		RTS/CTS, XON/XOFF			
Baudrate	50 bps to 460.8 kbps			50 bps to 921.6 kbps			
Electrical Isolation	–	–	2 kV	–	2 kV	2 kV	2 kV
Driver Support							
Windows 95/98/ME/NT	–	–	–	–	–	–	–
Windows 2000	✓	✓	✓	✓	✓	✓	✓
Windows XP/2003/Vista (x86/x64)	✓	✓	✓	✓	✓	✓	✓
Windows 2008 (x86/x64)	✓	✓	✓	✓	✓	✓	✓
Windows 7 (x86/x64)	✓	✓	✓	✓	✓	✓	✓
Windows 8/8.1(x86/x64)	✓	✓	✓	✓	✓	✓	✓
Windows 10 (x86/x64)	✓	✓	✓	✓	✓	✓	✓
Windows 2008 R2/2012/2012 R2 (x64)	✓	✓	✓	✓	✓	✓	✓
Windows CE 5.0	–	–	–	✓	✓	✓	✓
Windows CE 6.0	–	–	–	✓	✓	✓	✓
Windows XP Embedded	✓	✓	✓	✓	✓	✓	✓
DOS	✓	✓	✓	–	–	–	–
Linux 2.4.x, 2.6.x, 3.x	✓	✓	✓	✓	✓	✓	✓
FreeBSD 4/5	–	–	–	–	–	–	–
QNX 4.25	–	–	–	–	–	–	–
QNX 6	✓	✓	✓	✓	✓	✓	✓
SCO Open Server	✓	✓	✓	✓	✓	✓	✓
UnixWare 7	✓	✓	✓	✓	✓	✓	✓
Solaris 10	–	–	–	✓	✓	✓	✓
Environmental Limits							
Dimensions	67.21 x 101.97 mm (2.65 x 4.08 in)	67.21 x 101.97 mm (2.65 x 4.08 in)	67.21 x 103.97 mm (2.65 x 4.16 in)	97.9 x 88.9 mm (3.86 x 3.50 in)	109.5 x 130 mm (4.31 x 5.11 in)		67.2 x 103 mm (2.69 x 4.06 in)
Operating Temperature	0 to 55°C (32 to 131°F)						
Storage Temperature	-20 to 85°C (-4 to 185°F)						
Ambient Relative Humidity	5 to 95% (non-condensing)						
Standards and Certifications							
EMC	EN 55022/24	EN 55022/24	EN 55022/24	EN 55022/24	EN 55022/24	EN 55022/24	EN 55022/24
EMI	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B
EMS	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11			IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 4 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 4 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11		
Reliability							
MTBF	Time: 4,947,552 hrs Standard: Telcordia (Bellcore) TR/SR	Time: 4,147,133 hrs Standard: Telcordia (Bellcore) TR/SR	Time: 1,681,099 hrs Standard: Telcordia (Bellcore) TR/SR	Time: 310,993 hrs Standard: Telcordia (Bellcore) TR/SR	Time: 390,883 hrs Standard: Telcordia (Bellcore) TR/SR	Time: 221,331 hrs Standard: Telcordia (Bellcore) TR/SR	Time: 431,064 hrs Standard: Telcordia (Bellcore) TR/SR
Warranty	5 years (see www.moxa.com/warranty)						
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Universal PCI Serial Boards

	C320Turbo/PCI	C218Turbo/PCI	CP-118U CP-118U-T	CP-138U CP-138U-T	CP-118U-I CP-118U-I-T	CP-138U-I CP-138U-I-T	CP-168U CP-168U-T	CP-114UL CP-114UL-T	CP-114UL-I CP-114UL-I-T	CP-104UL CP-104UL-T
Hardware										
Comm. Controller	MU860 (16C550C compatible)									
Bus	32-bit Universal PCI									
Connector	DB25 female	DB62 female			DB78 female		DB62 female	DB44 female		
Serial Interface										
RS-232 Ports	32	8	–	–	–	–	8	–	–	4
RS-422/485 Ports	–	–	–	8	–	8	–	–	–	–
RS-232/422/485 Ports	–	–	8	–	8	–	–	4	4	–
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark									
Flow Control	–	–	RTS/CTS, XON/XOFF				RTS/CTS, XON/XOFF			
Baudrate	50 bps - 460.8 kbps	50 bps - 921.6 kbps								
Electrical Isolation	–	–	–	–	2 kV	2 kV	–	–	2 kV	–
Driver Support										
Windows 95/98/ME/NT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 2000	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows XP/2003/Vista (x86/x64)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 2008 (x86/x64)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 7 (x86/x64)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 8/8.1 (x86/x64)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 10 (x86/x64)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 2008 R2/2012/2012 R2 (x64)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows CE 5.0	–	–	✓	✓	✓	✓	✓	✓	✓	✓
Windows CE 6.0	–	–	✓	✓	✓	✓	✓	✓	✓	✓
Windows XP Embedded	–	–	✓	✓	✓	✓	✓	✓	✓	✓
DOS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Linux 2.4.x, 2.6.x, 3.x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
FreeBSD 4/5	–	–	✓	✓	✓	✓	✓	✓	✓	✓
QNX 4.25	✓	✓	–	–	–	–	–	–	–	–
QNX 6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
SCO Open Server	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
UnixWare 7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Environmental Limits										
Dimensions	101.34 x 121.86 mm (3.99 x 4.80 in)	105 x 180 mm (4.13 x 7.09 in)	82 x 135 mm (3.22 x 5.31 in)	82 x 135 mm (3.22 x 5.31 in)	105 x 133 mm (4.13 x 5.23 in)	105 x 133 mm (4.13 x 5.23 in)	82 x 120 mm (3.22 x 4.72 in)	64.4 x 120 mm (2.53 x 4.72 in)	64.4 x 130 mm (2.53 x 5.12 in)	64.4 x 120 mm (2.53 x 4.72 in)
Operating Temperature – Standard Temperature	0 to 55°C (32 to 131°F)		0 to 55°C (32 to 131°F)							
Operating Temperature – Wide Temperature	–		-40 to 60°C (-40 to 140°F)							
Storage Temperature	-20 to 85°C (-4 to 185°F)		-40 to 60°C (-40 to 140°F)							
Ambient Relative Humidity	5 to 95% (non-condensing)		5 to 95% (non-condensing)							
Standards and Certifications										
EMC	EN 55022/24	EN 55022/24	EN 55022/24	EN 55022/24	EN 55022/24	EN 55022/24	EN 55022/24	EN 55022/24	EN 55022/24	EN 55022/24
EMI	CISPR 22, FCC Part 15B Class A	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B
EMS	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m			IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV		IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11	
Reliability										
MTBF	Time: 305,270 hrs Standard: MIL-HDBK-217F	Time: 303,325 hrs Standard: MIL-HDBK-217F	Time: 1,073,385 hrs Standard: Telcordia (Bellcore) SR-332	Time: 1,147,210 hrs Standard: Telcordia (Bellcore) SR-332	Time: 350,975 hrs Standard: Telcordia (Bellcore) SR-332	Time: 370,390 hrs Standard: Telcordia (Bellcore) SR-332	Time: 280,854 hrs Standard: Telcordia	Time: 114,223 hrs Standard: Telcordia (Bellcore) SR-332		Time: 558,961 hrs Standard: MIL-HDBK-217F
Warranty	5 years (see www.moxa.com/warranty)									
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Universal PCI Serial Boards

	CP-104JU CP-104JU-T	CP-134U CP-134U-T	CP-134U-I CP-134U-I-T	CP-112UL CP-112UL-T	CP-112UL-I CP-112UL-I-T	CP-102U CP-102U-T	CP-102UL CP-102UL-T	CP-132UL CP-132UL-T	CP-132UL-I CP-132UL-I-T	POS-104UL POS-104UL-T
Hardware										
Comm. Controller	MU860 (16C550C compatible)									
Bus	32-bit Universal PCI									
Connector	RJ45 x 4	DB44 female		DB25 female		DB9 male x 2	DB25 female			DB44 female
Serial Interface										
RS-232 Ports	4	–	–	–	–	2	2	–	–	4
RS-422/485 Ports	–	4	4	–	–	–	–	2	2	–
RS-232/422/485 Ports	–	–	–	2	2	–	–	–	–	–
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark									
Flow Control	RTS/CTS, XON/XOFF							XON/XOFF		RTS/CTS, XON/XOFF
Baudrate	50 bps to 921.6 kbps									
Electrical Isolation	–	–	2 kV	–	2 kV	–	–	–	2 kV	–
Driver Support										
Windows 95/98/ME/NT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 2000	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows XP/2003/Vista (x86/x64)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 2008 (x86/x64)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 7 (x86/x64)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 8/8.1(x86/x64)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 10 (x86/x64)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 2008 R2/2012/2012 R2 (x64)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows CE 5.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows CE 6.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows XP Embedded	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DOS	✓	✓	✓	–	–	✓	✓	✓	✓	✓
Linux 2.4.x, 2.6.x, 3.x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
FreeBSD 4/5	✓	✓	✓	–	–	✓	✓	✓	✓	✓
QNX 4.25	–	–	–	–	–	–	–	–	–	–
QNX 6	✓	✓	✓	–	–	✓	✓	✓	✓	✓
SCO Open Server	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
UnixWare 7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Environmental Limits										
Dimensions	83 x 120 mm (3.27 x 4.72 in)	82.5 x 120 mm (3.24 x 4.72 in)	115 x 120 mm (4.52 x 4.72 in)	64.4 x 120 mm (2.53 x 4.72 in)	64.4 x 120 mm (2.53 x 4.72 in)	80 x 120 mm (3.15 x 4.72 in)	64.5 x 120 mm (2.53 x 4.72 in)	64.4 x 120 mm (2.53 x 4.72 in)	64.4 x 120 mm (2.53 x 4.72 in)	64.4 x 120 mm (2.53 x 4.72 in)
Operating Temperature – Standard Temperature	0 to 55°C (32 to 131°F)									
Operating Temperature – Wide Temperature	-40 to 85°C (-40 to 185°F)									
Storage Temperature	-40 to 85°C (-40 to 185°F)									
Ambient Relative Humidity	5 to 95% (non-condensing)									
Standards and Certifications										
EMC	EN 55022/24	EN 55022/24	EN 55022/24	EN 55022/24	EN 55022/24	EN 55022/24	EN 55022/24	EN 55022/24	EN 55022/24	EN 55022/24, EN 61000-6-2/-6-4
EMI	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B
EMS	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m			IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11		IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11			IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m Signal: 10 V/m IEC 61000-4-8 PFMF IEC 61000-4-11
Reliability										
MTBF	Time: 571,627 hrs Standard: Telcordia (Bellcore) TR/SR	Time: 480,209 hrs Standard: Telcordia (Bellcore) TR/SR	Time: 360,732 hrs Standard: Telcordia (Bellcore) TR/SR	Time: 219,971 hrs Standard: Telcordia (Bellcore) SR-332		Time: 574,050 hrs Standard: MIL-HDBK-217F	Time: 576,401 hrs Standard: Telcordia (Bellcore) TR/SR	Time: 1,647,832 hrs Standard: Telcordia (Bellcore) SR-332		Time: 2,124,022 hrs Standard: Telcordia (Bellcore) TR/SR
Warranty	5 years (see www.moxa.com/warranty)									
Page	12-45	12-47	12-47	12-49	12-49	12-51	12-51	12-53	12-53	12-55

ISA Serial Boards

	C168H/C168HS	C104H/C104HS	CI-134/CI-134I/CI-134IS	CI-132/CI-132I/CI-132IS
Hardware				
Comm. Controller	16C550C compatible			
Bus	16-bit ISA			
Connector	DB62 female	DB37 female	DB37 female	DB9 male x 2
Serial Interface				
RS-232 Ports	8	4	–	–
RS-422/485 Ports	–	–	4	2
RS-232/422/485 Ports	–	–	–	–
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark			
Flow Control	–	–	–	–
Baudrate	50 bps to 921.6 kbps			
Electrical Isolation	–	–	– / 2 kV / 2 kV	– / 2 kV / 2 kV
Driver Support				
Windows 95/98/ME/NT	✓	✓	✓	✓
Windows 2000	✓	✓	✓	✓
Windows XP/2003/Vista (x86)	✓	✓	✓	✓
Windows 2008 (x86)	✓	✓	✓	✓
Windows 7 (x86)	✓	✓	✓	✓
Windows 8/8.1 (x86)	✓	✓	✓	✓
Windows 10 (x86)	✓	✓	✓	✓
Windows CE 5.0	–	–	–	–
Windows CE 6.0	–	–	–	–
Windows XP Embedded	✓	✓	✓	✓
DOS	✓	✓	✓	✓
Linux 2.4.x, 2.6.x, 3.x	✓	✓	✓	✓
FreeBSD 4/5	✓	✓	✓	✓
QNX 4.25	✓	✓	✓	✓
QNX 6	✓	✓	✓	✓
SCO Open Server	✓	✓	✓	✓
UnixWare 7	✓	✓	✓	✓
Environmental Limits				
Dimensions	93 x 157 mm (3.66 x 6.18 in)	83 x 157 mm (3.27 x 6.18 in)	CI-134: 85 x 160 mm (3.35 x 6.30 in) CI-134I/IS: 110 x 180 mm (4.33 x 7.09 in)	CI-132: 75 x 157 mm (2.95 x 6.18 in) CI-132I/IS: 105 x 157 mm (4.13 x 6.18 in)
Operating Temperature	0 to 55°C (32 to 131°F)			
Storage Temperature	-20 to 85°C (-4 to 185°F)			
Ambient Relative Humidity	5 to 95% (non-condensing)			
Standards and Certifications				
EMC	EN 55022/24	EN 55022/24	EN 55022/24	EN 55022/24
EMI	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B
EMS	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11		IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Signal: 2 kV	
Reliability				
MTBF	Time: 601,501 hrs Standard: MIL-HDBK-217F	Time: 629,545 hrs Standard: MIL-HDBK-217F	Time: 424,655 hrs Standard: Telcordia (Bellcore) TR/SR	Time: 441,015 hrs Standard: Telcordia (Bellcore) TR/SR
Warranty	5 years (see www.moxa.com/warranty)			
Page	12-57	12-58	12-59	12-60

CAN Interface Boards/Modules

	CP-602U-I CP-602U-I-T	CP-602E-I CP-602E-I-T	CB-602I CB-602I-T
Hardware			
CAN Controller	NXP SJA1000		
CAN Transceiver	PCA82C251		
Bus	32-bit Universal PCI	PCI Express x1	PC/104-Plus bus
Connector	DB9 male x 2	DB9 male x 2	20-pin
CAN Interface			
CAN Specification	CAN 2.0 A/B		
Signal Support	CAN _H, CAN_L, GND		
Ports	2		
Transfer Rate	1 Mbps		
Max Number of Boards per PC	4		
Electrical Isolation	2 kV		
Termination Resistors	120 ohm (selected by jumper)		
Driver Support			
Windows 2000	✓	✓	✓
Windows XP/2003/Vista (x86/x64)	✓	✓	✓
Windows 2008 (x86/x64)	✓	✓	✓
Windows 7 (x86/x64)	✓	✓	✓
Windows 8/8.1 (x86/x64)	✓	✓	✓
Windows 2008 R2/2012/2012 R2 (x64)	✓	✓	✓
Visual Basic Library	✓	✓	✓
C/C++ Library	✓	✓	✓
Environmental Limits			
Dimensions	80 x 120 mm (3.15 x 4.72 in)	85 x 100 mm (3.35 x 3.94 in)	90.2 x 95.9 mm (3.55 x 3.78 in)
Operating Temperature – Standard Temperature	0 to 55°C (32 to 131°F)		
Operating Temperature – Wide Temperature	-40 to 85°C (-40 to 185°F)		
Storage Temperature	-40 to 85°C (-40 to 185°F)		
Ambient Relative Humidity	5 to 95% (non-condensing)		
Standards and Certifications			
EMC	EN 55022/24	EN 55022/24	EN 55022/24
EMI	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B	CISPR 22, FCC Part 15B Class B
EMS	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m Signal: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11
Reliability			
MTBF	Time: 1,989,990 hrs Standard: Telcordia (Bellcore) SR-332	Time: 4,645,502 hrs Standard: Telcordia (Bellcore) SR-332	Time: 248,563 hrs Standard: Telcordia (Bellcore) SR-332
Warranty	5 years (see www.moxa.com/warranty)		
Page	12-63	12-62	12-64

The Basics of RS-232/422/485

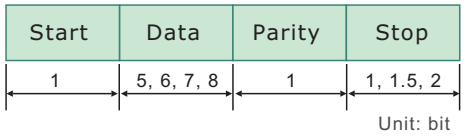
RS-232—the most common and easy-to-use communication interface

The RS-232 serial interface was developed to connect a computer to common peripherals such as modems, overhead projectors, and the sensors and actuators used for industrial automation applications. Despite its limited 15 m transmission distance, RS-232 is low cost and easy-to-wire, making it the first choice for many applications.

RS-232 establishes full-duplex (2-way) communication, with signals represented by voltage levels measured with respect to a system common ground (power or logic ground). The "idle" state (MARK) is negative with respect to the common ground, and the "active" state (SPACE) is positive with respect to the common ground.

RS-232 Data Format

Start bit: 1 bit
Data bits: 5, 6, 7, or 8 bits
Parity: None, Odd, Even, Space, Mark
Stop bits: 1, 1.5 (if data bits = 5), or 2 bits



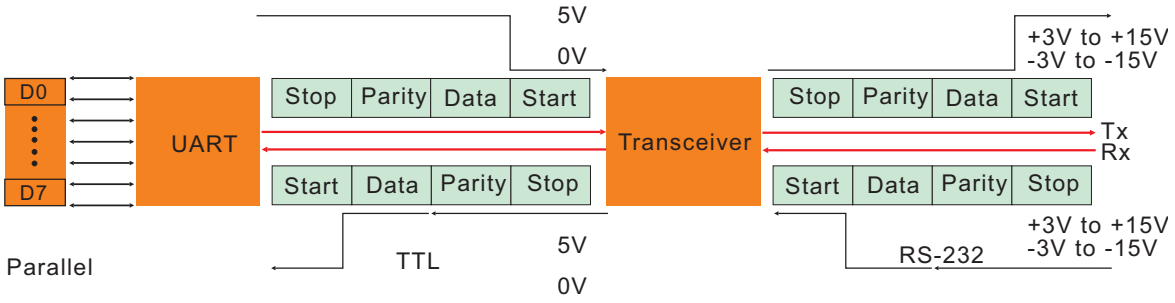
RS-232 Specifications

Standard	Connection Type	Operation Mode	Drivers per Line	Receivers per Line	Max. Cable Length	Max. Data Rate
EIA RS-232	Point-to-point	Single-ended	1	1	50 ft (15 m)	921.6 kbps

RS-232 Signal Definition

The general relationship between the UART, TTL signal, transceiver, and RS-232 signal is illustrated in the following figure. UART is short for "universal asynchronous receiver transmitter," and TTL stands for "transistor-to-transistor logic." The UART, which is located on the serial board and stands between the computer's CPU and the transceiver, transmits signals at 0 and 5 volts. The RS-232 transceiver converts the signal voltage to +3V to +15V, and -3V to -15V.

TxD	Transmit Data
RxD	Receive Data
RTS	Request to Send
CTS	Clear to Send
DTR	Data Terminal Ready
DSR	Data Set Ready
DCD	Data Carrier Detect
GND	Ground



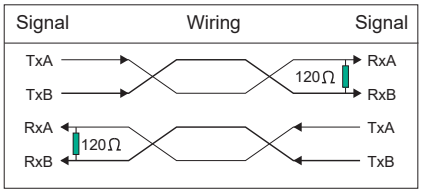
RS-422/485—tailor-made for industrial applications

Many of the devices used in today's industrial environments are designed for the RS-422 and RS-485 interfaces, both of which use "differential transmission" to "subtract out" external electronic and electromagnetic disturbances. For this reason, RS-422/485 can be used to transmit data up to 1.2 km. In addition to the need for long distance and multi-drop transmission, many industrial applications also require isolation, proper housing, heavy-duty wiring, a reliable power supply, and over-surge protection.

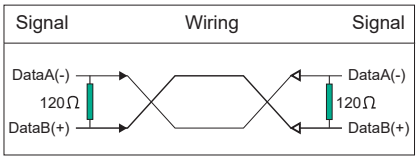
Differential Transmission

The RS-422 and RS-485 protocols use differential transmission to achieve high-speed data transmission (up to 10 Mbps) over distances up to 4,000 feet (1.22 km). Differential transmission works by splitting each signal into two separate wires with opposite voltage states. The signals are subtracted at the receiving end, making this type of wiring configuration well-suited for noisy environments.

RS-422 Wiring



RS-485 Wiring



RS-422 vs. RS-485

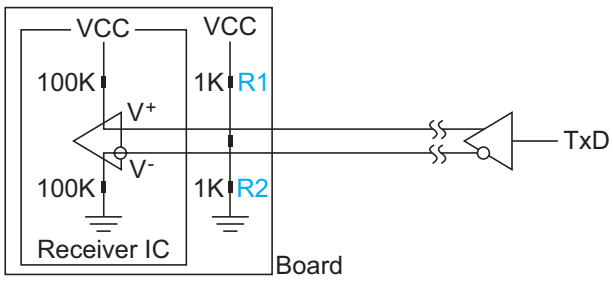
Standard	Connection Type	Operation Mode	Drivers per Line	Receivers per Line	Max. Cable Length	Max. Data Rate
EIA RS-422	Full-duplex, Point-to-point	Differential	1	10	4000 ft (1.22 km)	1 Mbps
EIA RS-485	Half-duplex, Multi-drop	Differential	32	31	4000 ft (1.22 km)	1 Mbps

Multi-drop Networks

RS-485 was designed for applications that require connecting multiple devices to a single data line. An RS-485 multi-drop network uses a balanced transmission system that can accept up to 32 devices on the same data line. This is achieved with tri-state drivers that are controlled by a programmable handshake line to ensure that only one device acts as a driver at any given time.

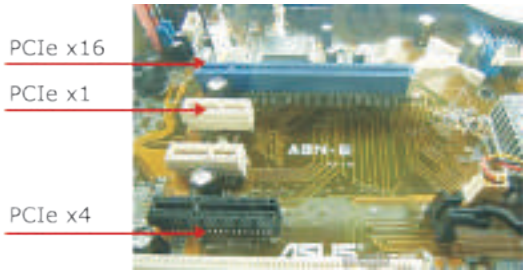
Termination

In order to prevent signal reflection, termination resistors are used to match the impedance of the receive and transmit nodes. The resistance needed to match the characteristic impedance is specified by the cable manufacturer. The most common value is 120 ohms.



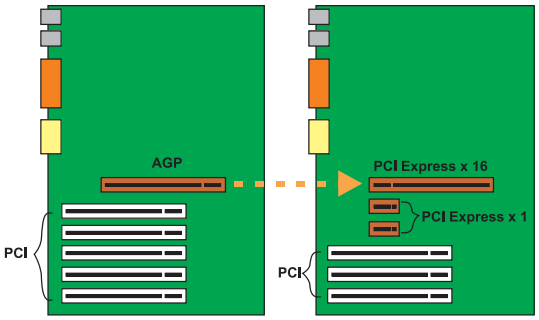
Introduction to PCI Express

The PCI Express serial interface is capable of transmitting data at 2.5 Gbps. This extremely high rate of data transmission is achieved by transmitting data bit-by-bit over "lanes" that consist of 2 pairs of wires (2 wires for transmitting and 2 wires for receiving). A single connection can achieve a burst mode transmission speed of 320 Mbps.



PCI Express to replace PCI, PCI-X, and AGP

The older PCI specification is based on a multi-drop parallel bus design. PCI Express, which will eventually replace PCI, PCI-X, and AGP, is a brand new I/O technology defined by the PCI-SIG. The PCI-SIG's stated goal is to create a unified standard that can handle a wide range of tasks.



Moxa's PCI Express Boards Fit Any PCI Express Slot

Multiple lanes are combined to create a PCI Express link, with the number of lanes used to label the connection by writing x1, x2, x4, x12, x16, or x32. Note that each lane uses 4 wires (e.g., a PCI Express x1 board uses 4 wires, and a PCI Express x16 board uses 64 wires). It should come as no surprise then that different-sized connections use different-sized slots. However, the beauty of the PCI Express design is that a PCI Express board can be installed in larger slots. This means that you can install Moxa's PCI Express x1 boards in any PCI Express slot.

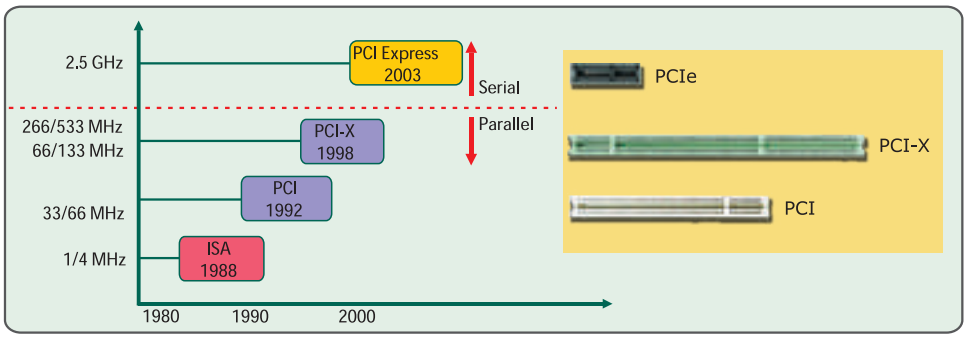
The difference between PCI and PCI Express

PCI Express is a serial interface that allows point-to-point connections between devices. This differs from the older PCI bus specification that uses a shared, parallel bus architecture.

Bus Trend

ISA → PCI → PCI-X → PCI Express (PCIe)

Bus Transmission Speeds

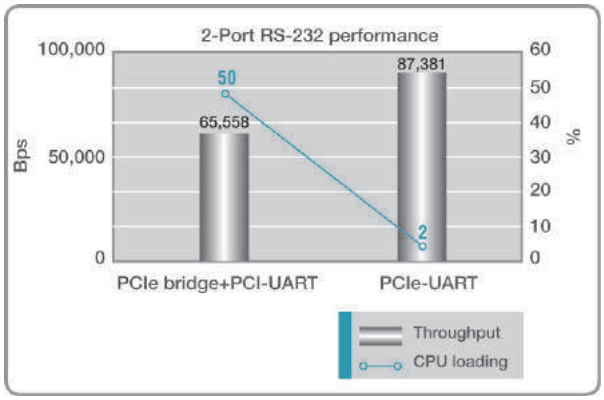


Another World First: Moxa Launches the "One-chip" PCI Express Board

For more than 25 years, Moxa has dedicated a large percentage of its R&D effort to the design of multiport serial boards, and this effort has paid off once again to the benefit of end-users around the world. Moxa's new "one-chip" PCI Express boards stand high above the crowd compared with other PCI Express boards on the market today. In fact, Moxa is the first manufacturer in the world to use an advanced one-chip PCIe-UART chip, which combines the PCIe bridge and UART on the same chip. The one-chip PCIe boards are designed for a longer MTBF and greater performance with baudrates up to 921.6 kbps. Moreover, instead of requiring users to open up the computer to set DIP switches and jumpers manually, one-chip PCIe provides a convenient software solution for configuring the serial interface and termination resistors, giving users the benefit of easy maintenance.

One-chip Solution Optimizes CPU Performance

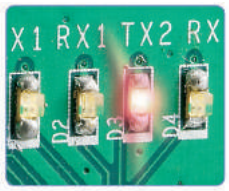
One-chip PCIe features a 33% higher throughput and decreases CPU load by 48%, outperforming traditional boards that use separate chips for the PCIe bridge and UART.



DIP Switchless and Jumperless Design

With this PCIe-UART, you can configure the serial interface and termination resistor by software instead of using a DIP switch and jumper. The absence of a DIP switch and jumper also makes these one-chip PCIe boards more user-friendly and easier to maintain since there is no need to open up the computer to adjust the settings manually. Furthermore, the one-chip design reduces manufacturing time and costs since fewer components are required.

Onboard LEDs for Easy Maintenance



Moxa's multiport serial boards have onboard LEDs to clearly indicate data transmit/receive status. This is very helpful for users, especially since troubleshooting can be done without opening up the computer.

Drivers Galore

Moxa's PCI Express boards support a wide range of drivers for desktop solutions (Windows 2000, XP/Vista/7/8/8.1/10 x86/x64) and server solutions (Windows 2003/2008/2012, with certification). Moreover, we also provide drivers for Linux, SCO Open Server 5/6, QNX 6, Windows XP Embedded, UnixWare 7.

CP-116E-A

16-port RS-232/422/485 PCI Express board with 4 kV surge protection

- PCI Express x1 compliant
- Serial communication speed up to 921.6 kbps
- 128-byte FIFO and on-chip H/W, S/W flow control
- Variety of connection cables and boxes available for RS-232/422/485
- Drivers provided for the latest versions of Windows, Linux, and Unix
- Easy maintenance with on-board LED display and management software

PComm Lite

Overview

The CP-116E-A is a smart PCI Express multiport serial board designed for POS and ATM applications, and for use by industrial automation system manufacturers and system integrators. The CP-116E-A is compatible with all popular operating systems, and each of its 8 serial ports supports data rates of up to 921.6 kbps and provides full modem control signals, ensuring compatibility with a wide range of serial peripherals. In addition, the CP-116E-A works with PCI Express x1, allowing the board to be installed in any PCI Express slot.

Intelligent RS-485 for Easy Installation and Troubleshooting (Patent Pending)

Setting up an RS-485 network is relatively straightforward. The challenge comes when the power is turned on and the devices connected to the network start transmitting and receiving data. In most cases, engineers will need to further tune the system by configuring pull high/low resistors and terminators at strategic points along the network. Moxa's new Intelligent RS-485 technology supports two essential features to make it easy: (1) One-Click Installation automatically analyzes the network topology and then adjusts terminators and pull high/low resistors. (2) One-Click Troubleshooting tells you what to change to make a deficient network viable.

Specifications

Hardware
Comm. Controller: 16C550C compatible
Bus: PCI Express x1
Connector: VHDCI 68

Serial Interface
Number of Ports: 16
Serial Standards: RS-232/422/485
Max. No. of Boards per PC: 4

Serial Line Protection
Surge Protection: 4 kV

Performance
Baudrate: 50 bps to 921.6 kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Physical Characteristics
Dimensions: 97.9 x 88.9 mm (3.86 x 3.50 in)

Driver Support
Windows: Windows 2000/XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64)
Linux: Linux 2.4.x, 2.6.x, 3.x
Unix-like Systems: QNX 6, SCO OpenServer, UnixWare 7, Solaris 10 (x86/x64)
Note: Please refer to Moxa's website for the latest driver support information.

Environmental Limits
Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 85°C (-4 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 4 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11

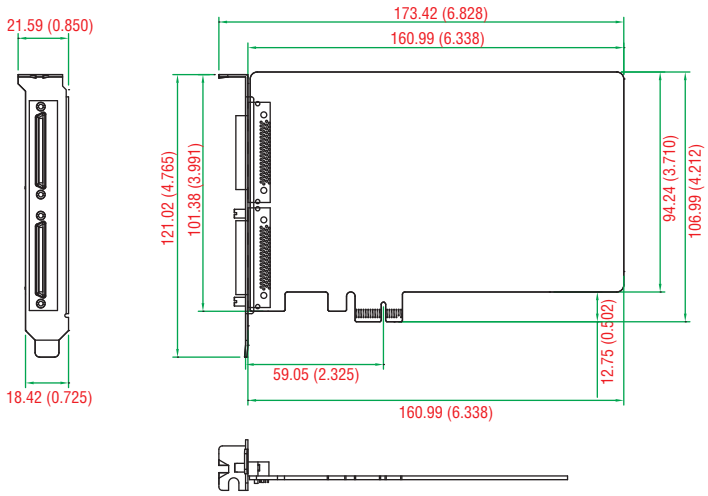
MTBF (mean time between failures)
Time: 310,993 hrs
Standard: Telcordia (Bellcore) TR/SR

Power Requirements
Input Current: 2,733 mA @ 3.3 VDC

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models
CP-116E-A: 16-port RS-232/422/485 PCI Express board w/ 4 kV surge protection

Connection Options (can be purchased separately)
CBL-M68M9x8-100: SCSI VHDCI 68 to 8 x DB9-M cable, 100 cm
CBL-M68M25x8-100: SCSI VHDCI 68 to 8 x DB25-M cable, 100 cm

Optional Connectors (choose one per board)
OPT8-M9+: VHDCI 68 to 8 x DB9-M connection box
OPT8B+: VHDCI 68 to 8 x DB25-M connection box
OPT8A+: VHDCI 68 to 8 x DB25-F connection box
OPT8-RJ45+: VHDCI 68 to 8 x RJ45 (8-pin) connection box
OPT8S+: VHDCI 68 to 8 x DB25-F connection box w/ surge protection

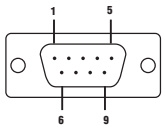
Package Checklist
- 1 CP-116E-A board
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

OPT8-M9+
DB9 male x 8 (150 cm cable)

CBL-M68M9x8-100
DB9 male x 8 (100 cm cable)

PIN	RS-232	RS-422/RS-485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

DB9 male

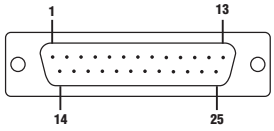


OPT8B+
DB25 male x 8 (150 cm cable)

CBL-M68M25x8-100
DB25 male x 8, (100 cm cable)

PIN	RS-232	RS-422/RS-485-4w	RS-485-2w
2	TxD	RxD+(B)	Data+(B)
3	RxD	TxD+(B)	–
4	RTS	–	–
5	CTS	–	–
6	DSR	–	–
7	GND	GND	GND
8	DCD	TxD-(A)	–
20	DTR	RxD-(A)	Data-(A)

DB25 male

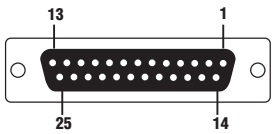


OPT8A+
DB25 female x 8 (150 cm cable)

OPT8S+
DB25 female x 8 (150 cm cable)

PIN	RS-232	RS-422/RS-485-4w	RS-485-2w
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	CTS	–	–
5	RTS	–	–
6	DTR	RxD-(A)	Data-(A)
7	GND	GND	GND
8	DCD	TxD-(A)	–
20	DSR	–	–

DB25 female



C320Turbo (PCI Express)

8 to 32-port intelligent PCI Express serial board

- PCI Express x 1 compliant
- Low profile form factor fits small-sized PCs
- Supports 128 high-performance serial ports per system
- Dramatically decreases host CPU load
- Modular design makes port expansion easy
- Monitor transmission status with LEDs on the module and two 7-segment displays
- Drivers provided for a broad selection of operating systems
- 460.8 kbps maximum baudrate

PComm Lite

Overview

The intelligent C320Turbo PCI Express serial board is an expandable and versatile COM/TTY solution for RS-232/RS-422 applications that require connecting up to 128 serial devices to one computer. The C320Turbo's on-board CPU and large dual-port memory alleviate the load of host system resources when performance and scalability are critical for large-scale systems.

Specifications

Hardware

Comm. Controller: 16C550C or compatible x 8
Bus: PCI Express x 1
Connector: DB25 female
Processor: TI DSP TMS320BC52PJ
Memory: 512 KB

Serial Interface

Number of Ports: 32 per control board (max.)
Serial Standards: RS-232 (RS-422 available with desktop option)
Max. No. of Boards per PC: 4

Performance

Baudrate: 50 bps to 460.8 kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+/-, RxD+/-, RTS+/-, CTS+/-, GND

Physical Characteristics

Dimensions: 135 x 67 mm (5.32 x 2.64 in)

Driver Support

Windows: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), DOS
Linux: Linux 2.4.x, 2.6.x, 3.x
Unix-like Systems: QNX 6, SCO OpenServer, UnixWare 7, Solaris 10
Note: Please refer to Moxa's website for the latest driver support information.

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 55°C (-4 to 131°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11

MTBF (mean time between failures)

Time: 2,937,578 hrs
Standard: Telcordia (Bellcore) TR/SR

Power Requirements

Input Current: 1,160 mA @ 3.3 VDC

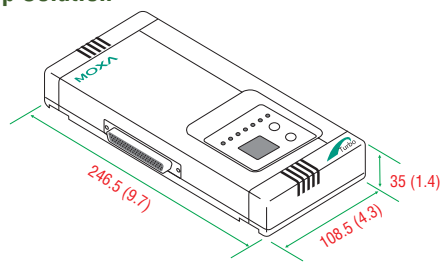
Warranty

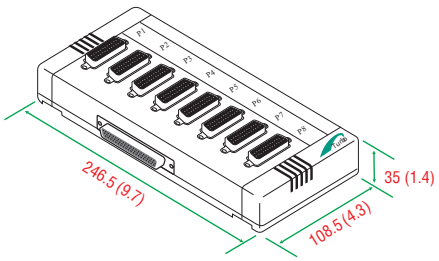
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

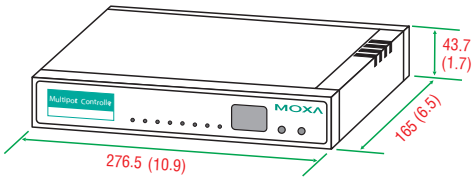
Unit: mm (inch)

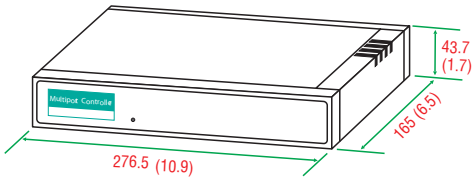
Desktop Solution





Rackmount Solution





	C32010T/PCIEL	C32030T	C32045T	C32047T	C32061T
Dimensions	67 x 135 mm (2.64 x 5.32 in)	247 x 108 x 35 mm (9.73 x 4.25 x 1.38 in)	247 x 108 x 35 mm (9.73 x 4.25 x 1.38 in)	247 x 108 x 35 mm (9.73 x 4.25 x 1.38 in)	247 x 108 x 35 mm (9.73 x 4.25 x 1.38 in)
Weight	80 g (0.18 lb)	425 g (0.94 lb)	500 g (1.11 lb)	485 g (1.07 lb)	488 g (1.08 lb)
Input Current	1.16 A @ 3.3 VDC	0.59 A @ +5 VDC	0.28 A @ +5 VDC 0.095 A @ +12 VDC 0.06 A @ -12 VDC	0.28 A @ +5 VDC 0.095 A @ +12 VDC 0.06 A @ -12 VDC	0.485 A @ +5 VDC

	C32065T	C32071T	C32080T	C32081T	C32082T	C32083T
Dimensions	247 x 108 x 35 mm (9.73 x 4.25 x 1.38 in)	247 x 108 x 35 mm (9.73 x 4.25 x 1.38 in)	277 x 165 x 44 mm (10.91 x 6.51 x 1.74 in)	277 x 165 x 44 mm (10.91 x 6.51 x 1.74 in)	277 x 165 x 44 mm (10.91 x 6.51 x 1.74 in)	277 x 165 x 44 mm (10.91 x 6.51 x 1.74 in)
Weight	525 g (1.16 lb)	525 g (1.16 lb)	1,020 g (2.25 lb)	1,120 g (2.47 lb)	920 g (2.03 lb)	1,000 g (2.21 lb)
Input Current	1.32 A @ +5 VDC	0.28 A @ +5 VDC 0.095 A @ +12 VDC 0.06 A @ -12 VDC	0.88 A @ +5 VDC 0.095 A @ +12 VDC 0.06 A @ -12 VDC	1.22 A @ +5 VDC 0.19 A @ +12 VDC 0.12 A @ -12 VDC	0.34 A @ +5 VDC 0.095 A @ +12 VDC 0.06 A @ -12 VDC	0.67 A @ +5 VDC 0.19 A @ +12 VDC

Ordering Information

Available Models

Control Boards (must choose one)
C32010T/PCIEL: PCI Express board

External Modules
Rackmount Option
Basic Modules (must choose one)
C32080T: 8 RS-232 ports, 10-pin RJ45 connectors
C32081T: 16-port, RS-232, 10-pin RJ45

Expansion Modules (optional)
C32082T: 8 RS-232 ports, 10-pin RJ45 connectors
C32083T: 16 RS-232 ports, 10-pin RJ45 connectors
• Long-range Extension Kit (optional)
C32050T: Includes the following items
• 2-meter DB25-M to DB25-F 10-wire cable (generally used for set-up)
• 90 to 240 VAC switching power adapter (0 to 30°C operating temperature)
NOTE: Build your own DB25-M to DB25-F 10-wire cable for connecting up to 100 meters.

Desktop Option
• CPU module
• One or more UART modules (32 ports maximum per board)
Rackmount Option
• Basic module
• Zero or more expansion modules (32 ports maximum per board)

Connection Cable (required)
C32020T: 2 meter DB25-M to DB25-F cable with 25 pins for short-range usage

Desktop Option
CPU Module (required)
C32030T: Connects directly to one UART module
8-port UART Modules (choose at least one)
C32045T: RS-232, DB25-F connectors
C32047T: RS-232, DB25-M connectors
C32071T: RS-232, DB25-F connectors
C32061T: RS-422, DB25-F connectors
C32065T: RS-422, DB25-F connectors (2 kV electrical isolation)

Package Checklist

- 1 C320Turbo/PCI board
- Power cable
- SATA to 4-pin IDE power cable
- Low-profile braket
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

CP-118EL-A

8-port RS-232/422/485 PCI Express serial board

PComm Lite

- PCI Express x1 compliant
- 921.6 kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Choose from a wide range of connection cables and boxes
- Low profile form factor fits small-sized PCs
- Drivers provided for a broad selection of operating systems, including the latest Windows and Linux

Overview

The CP-118EL-A is a smart, 8-port PCI Express board designed for POS and ATM applications. It is a top choice of industrial automation engineers and system integrators, and supports many different operating systems, including Windows, Linux, and even Unix. In addition, each of the board's 8 serial ports can be configured independently for RS-232, RS-422, or RS-485 (either 2-wire or 4-wire), and the ports supports a superfast 921.6 kbps baudrate. The CP-118EL-A provides full modem control signals to ensure compatibility with a wide range of serial peripherals, and its PCI Express "x1" classification allows it to be installed in any PCI Express slot.

Smaller Form Factor

The CP-118EL-A is a low-profile board that is compatible with any PCI Express slot. The board requires only a 3.3 VDC power supply, which means that the board fits any host computer, ranging from shoebox to standard-sized PCs.

Drivers Provided for Windows, Linux, and Unix

Moxa continues to support a wide variety of operating systems, and the CP-118EL-A board is no exception. Reliable Windows and Linux/Unix drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware

Comm. Controller: 16C550C compatible
Bus: PCI Express x1
Connector: VHDCI 68

Serial Interface

Number of Ports: 8
Serial Standards: RS-232/422/485
Max. No. of Boards per PC: 4

Performance

Baudrate: 50 bps to 921.6 kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Physical Characteristics

Dimensions: 68.9 x 88 mm (2.71 x 3.46 in)

Driver Support

Windows: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), DOS
Linux: Linux 2.4.x, 2.6.x, 3.x
Unix-like Systems: QNX 6, SCO OpenServer, UnixWare 7, Solaris 10
Note: Please refer to Moxa's website for the latest driver support information.

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 85°C (-4 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11

MTBF (mean time between failures)

Time: 1,359,482 hrs
Standard: Telcordia (Bellcore) TR/SR

Power Requirements

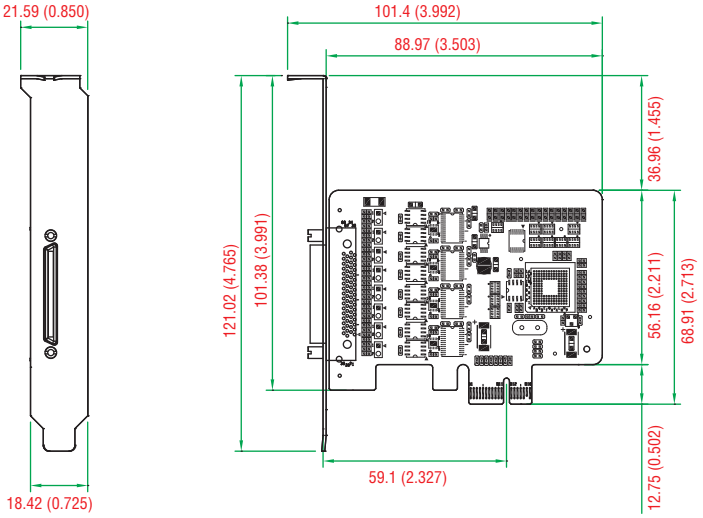
Input Current: 1,285 mA @ 3.3 VDC

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

CP-118EL-A: 8-port RS-232/422/485 low profile PCI Express x1 serial board

Connection Options (can be purchased separately)

Low Profile Bracket: Bracket for VHDCI connector (1490000008000)
CBL-M68M9x8-100: SCSI VHDCI 68 to 8 x DB9-M cable, 100 cm
CBL-M68M25x8-100: SCSI VHDCI 68 to 8 x DB25-M cable, 100 cm

Optional Connectors (choose one per board)

OPT8-M9+: VHDCI 68 to 8 x DB9-M connection box
OPT8B+: VHDCI 68 to 8 x DB25-M connection box
OPT8A+: VHDCI 68 to 8 x DB25-F connection box
OPT8-RJ45+: VHDCI 68 to 8 x RJ45 (8-pin) connection box
OPT8S+: VHDCI 68 to 8 x DB25-F connection box w/ surge protection

Package Checklist

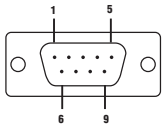
- 1 CP-118EL-A board
- Low profile bracket
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

OPT8-M9+
DB9 male x 8 (150 cm cable)

CBL-M68M9x8-100
DB9 male x 8 (100 cm cable)

PIN	RS-232	RS-422/RS-485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

DB9 male

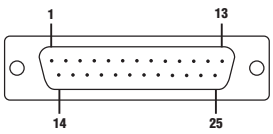


OPT8B+
DB25 male x 8 (150 cm cable)

CBL-M68M25x8-100
DB25 male x 8, (100 cm cable)

PIN	RS-232	RS-422/RS-485-4w	RS-485-2w
2	TxD	RxD+(B)	Data+(B)
3	RxD	TxD+(B)	–
4	RTS	–	–
5	CTS	–	–
6	DSR	–	–
7	GND	GND	GND
8	DCD	TxD-(A)	–
20	DTR	RxD-(A)	Data-(A)

DB25 male

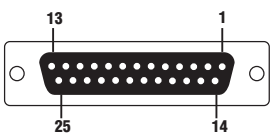


OPT8A+
DB25 female x 8 (150 cm cable)

OPT8S+
DB25 female x 8 (150 cm cable)

PIN	RS-232	RS-422/RS-485-4w	RS-485-2w
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	CTS	–	–
5	RTS	–	–
6	DTR	RxD-(A)	Data-(A)
7	GND	GND	GND
8	DCD	TxD-(A)	–
20	DSR	–	–

DB25 female



CP-118E-A-I/138E-A-I

8-port 3-in-1, RS-422/485 PCI Express board with 4 kV surge protection and 2 kV electrical isolation

CP-118E-A-I

CP-138E-A-I

- PCI Express x1 compliant
- Serial communication speed up to 921.6 kbps
- 128-byte FIFO and on-chip S/W flow control
- Variety of connection cables and boxes available for RS-232/422/485
- Drivers provided for the latest versions of Windows, Linux, and Unix
- Easy maintenance with on-board LED display and management software

Overview

The CP-118E-A-I and CP-138E-A-I are smart PCI Express multiport serial boards designed for POS and ATM applications, and for use by industrial automation system manufacturers and system integrators. The CP-118E-A-I and CP-138E-A-I are compatible with all popular operating systems, and each of their 8 serial ports supports data rates of up to 921.6 kbps and provide full modem control signals, ensuring compatibility with a wide range of serial peripherals. In addition, the CP-118E-A-I and CP-138E-A-I work with PCI Express x1, allowing the boards to be installed in any PCI Express slot.

Intelligent RS-485 for Easy Installation and Troubleshooting (Patent Pending)

Setting up an RS-485 network is relatively straightforward. The challenge comes when the power is turned on and the devices connected to the network start transmitting and receiving data. In most cases, engineers will need to further tune the system by configuring pull high/low resistors and terminators at strategic points along the network. Moxa's new Intelligent RS-485 technology supports two essential features to make it easy: (1) One-Click Installation automatically analyzes the network topology and then adjusts terminators and pull high/low resistors. (2) One-Click Troubleshooting tells you what to change to make a deficient network viable.

Specifications

Hardware

Comm. Controller: 16C550C compatible
Bus: PCI Express x1
Connector: DB78 female

Serial Interface

Number of Ports: 8
Serial Standards:
CP-118E-A-I: RS-232/422/485
CP-138E-A-I: RS-422/485
Max. No. of Boards per PC: 4

Serial Line Protection

Surge Protection: 4 kV
Electrical Isolation: 2 kV

Performance

Baudrate: 50 bps to 921.6 kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Physical Characteristics

Dimensions: 109.5 x 130 mm (4.31 x 5.11 in)

Driver Support

Windows: Windows 2000/XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64)
Linux: Linux 2.4.x, 2.6.x, 3.x
Unix-like Systems: QNX 6, SCO OpenServer, UnixWare 7, Solaris 10 (x86/x64)
Note: Please refer to Moxa's website for the latest driver support information.

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 85°C (-4 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 4 kV
IEC 61000-4-6 CS: 150 kHz to; 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11

MTBF (mean time between failures)

Time:
CP-118E-A-I: 390,883 hrs
CP-138E-A-I: 221,331 hrs
Standard: Telcordia (Bellcore) TR/SR

Power Requirements

Input Current:
CP-118E-A-I: 2,356 mA @ 3.3 VDC
CP-138E-A-I: 2,356 mA @ 3.3 VDC

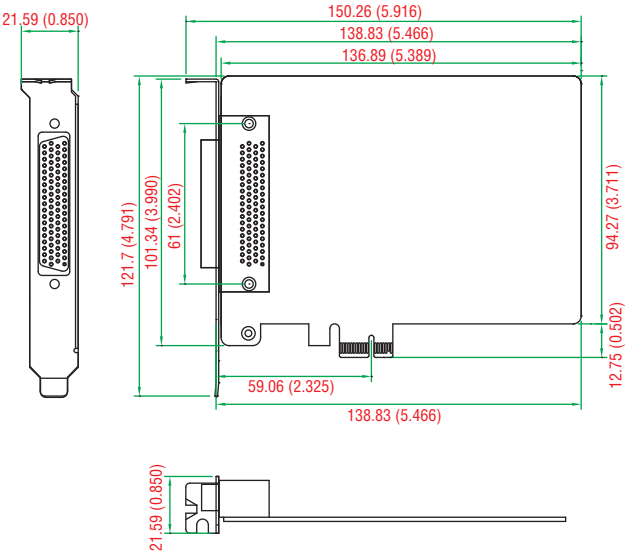
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

CP-118E-A-I/CP-138E-A-I



Ordering Information

Available Models

CP-118E-A-I: 8-port RS-232/422/485 PCI Express x1 serial board w/ surge protection and electrical isolation
CP-138E-A-I: 8-port RS-422/485 PCI Express Smart x1 serial board w/ surge protection and electrical isolation

Connection Options (can be purchased separately)

CBL-M68M9x8-100: SCSI VHDCI 68 to 8 x DB9-M cable, 100 cm
CBL-M68M25x8-100: SCSI VHDCI 68 to 8 x DB25-M cable, 100 cm

Optional Connectors (choose one per board)

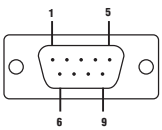
OPT8-M9+: VHDCI 68 to 8 x DB9-M connection box
OPT8B+: VHDCI 68 to 8 x DB25-M connection box
OPT8A+: VHDCI 68 to 8 x DB25-F connection box
OPT8-RJ45+: VHDCI 68 to 8 x RJ45 (8-pin) connection box
OPT8S+: VHDCI 68 to 8 x DB25-F connection box w/ surge protection

Package Checklist

- 1 CP-118E-A-I or CP-138E-A-I board
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

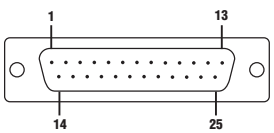
CBL-M78M9x8-100

DB9 male



CBL-M78M25x8-100

DB25 male



CP-168EL-A

8-port RS-232 PCI Express serial board

PComm Lite

- PCI Express x1 compliant
- 921.6 kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Choose from a wide range of connection cables and boxes
- Low profile form factor fits small-sized PCs
- Drivers provided for a broad selection of operating systems, including the latest Windows and Linux

Overview

The CP-168EL-A is a smart, 8-port PCI Express board designed for POS and ATM applications. It is a top choice of industrial automation engineers and system integrators, and supports many different operating systems, including Windows, Linux, and even Unix. In addition, each of the board's 8 RS-232 serial ports supports a super fast 921.6 kbps baudrate. The CP-168EL-A provides full modem control signals to ensure compatibility with a wide range of serial peripherals, and its PCI Express "x1" classification allows it to be installed in any PCI Express slot.

Smaller Form Factor

The CP-168EL-A is a low-profile board that is compatible with any PCI Express slot. The board requires only a 3.3 VDC power supply, which means that the board fits any host computer, ranging from shoebox to standard-sized PCs.

Drivers Provided for Windows, Linux, and Unix

Moxa continues to support a wide variety of operating systems, and the CP-168EL-A board is no exception. Reliable Windows and Linux/Unix drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware
Comm. Controller: 16C550C compatible
Bus: PCI Express x1
Connector: VHDCI 68

Serial Interface
Number of Ports: 8
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Performance
Baudrate: 50 bps to 921.6 kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Physical Characteristics
Dimensions: 64.42 x 102 mm (2.54 x 4.02 in)

Driver Support
Windows: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), DOS
Linux: Linux 2.4.x, 2.6.x, 3.x
Unix-like Systems: QNX 6, SCO OpenServer, UnixWare 7, Solaris 10
Note: Please refer to Moxa's website for the latest driver support information.

Environmental Limits
Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 85°C (-4 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11

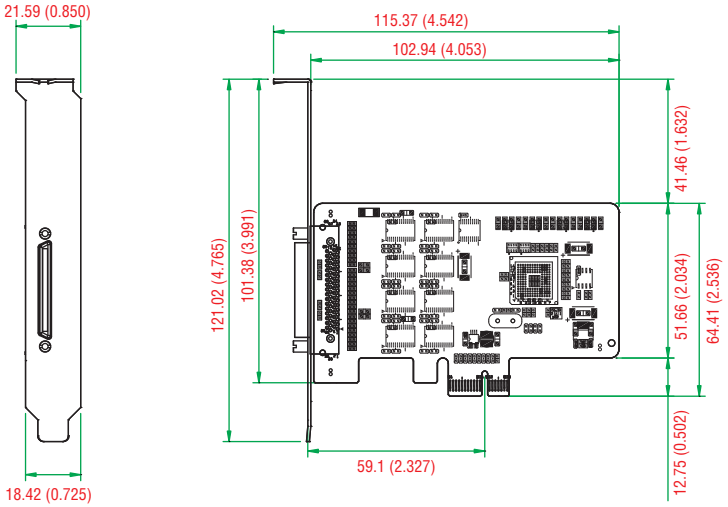
MTBF (mean time between failures)
Time: 2,351,336 hrs
Standard: Telcordia (Bellcore) TR/SR

Power Requirements
Input Current: 1,225 mA @ 3.3 VDC

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

CP-168EL-A: 8-port RS-232 low profile PCI Express x1 serial board

Connection Options (can be purchased separately)

Low Profile Bracket: Bracket for VHDCI connector (1490000008000)
CBL-M68M9x8-100: SCSI VHDCI 68 to 8 x DB9-M cable, 100 cm
CBL-M68M25x8-100: SCSI VHDCI 68 to 8 x DB25-M cable, 100 cm

Optional Connectors (choose one per board)

OPT8-M9+: VHDCI 68 to 8 x DB9-M connection box
OPT8B+: VHDCI 68 to 8 x DB25-M connection box
OPT8A+: VHDCI 68 to 8 x DB25-F connection box
OPT8-RJ45+: VHDCI 68 to 8 x RJ45 (8-pin) connection box
OPT8S+: VHDCI 68 to 8 x DB25-F connection box w/ surge protection

Package Checklist

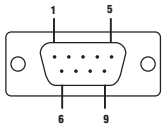
- 1 CP-168EL-A board
- Low profile bracket
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

OPT8-M9+
DB9 male x 8 (150 cm cable)

CBL-M68M9x8-100
DB9 male x 8 (100 cm cable)

PIN	RS-232	PIN	RS-232
1	DCD	5	GND
2	RxD	6	DSR
3	TxD	7	RTS
4	DTR	8	CTS

DB9 male

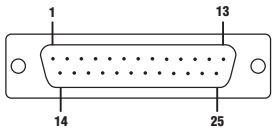


OPT8B+
DB25 male x 8 (150 cm cable)

CBL-M68M25x8-100
DB25 male x 8 (100 cm cable)

PIN	RS-232	PIN	RS-232
2	TxD	6	DSR
3	RxD	7	GND
4	RTS	8	DCD
5	CTS	20	DTR

DB25 male

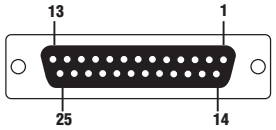


OPT8A+
DB25 female x 8, 150 cm cable

OPT8S+
DB25 female x 8 (150 cm cable)

PIN	RS-232	PIN	RS-232
2	RxD	6	DTR
3	TxD	7	GND
4	CTS	8	DCD
5	RTS	20	DSR

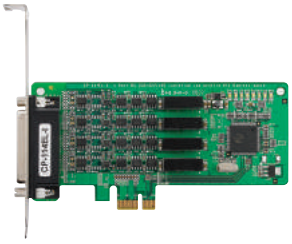
DB25 female



CP-114EL/EL-I

4-port RS-232/422/485 PCI Express boards with optional 2 kV isolation

CP-114EL-I



PComm Lite

- PCI Express x1 compliant
- 921.6 kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Low profile form factor fits small-sized PCs
- Drivers provided for a broad selection of operating systems, including the latest Windows and Linux

Overview

The CP-114EL and CP-114EL-I are smart, 4-port PCI Express boards designed for POS and ATM applications. The boards are a top choice of industrial automation engineers and system integrators, and support many different operating systems, including Windows and Linux. In addition, each of the boards' 4 RS-232/422/485 serial ports supports a super fast 921.6 kbps baudrate. The CP-114EL and CP-114EL-I provide full modem control signals to ensure compatibility with a wide range of serial peripherals, and their PCI Express "x1" classification allows the boards to be installed in any PCI Express slot.

Smaller Form Factor

The CP-114EL and CP-114EL-I are low profile boards that are compatible with any PCI Express slot. The boards require only a 3.3 VDC power supply, which means that the boards fit any host computer, ranging from shoebox to standard-sized PCs.

Drivers Provided for Windows, Linux, and Unix

Moxa continues to support a wide variety of operating systems, and the CP-114EL/EL-I boards are no exception. Reliable Windows and Linux drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware

Comm. Controller: 16C550C compatible
Bus: PCI Express x1
Connector: DB44 female

Serial Interface

Number of Ports: 4
Serial Standards: RS-232/422/485
Max. No. of Boards per PC: 4

Serial Line Protection

Electrical Isolation: 2 kV (CP-114EL-I only)

Performance

Baudrate: 50 bps to 921.6 kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Physical Characteristics

Dimensions:
CP-114EL: 67.21 x 103 mm (2.65 x 4.06 in)
CP-114EL-I: 67.21 x 135 mm (2.65 x 5.31 in)

Driver Support

Windows: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), DOS
Linux: Linux 2.4.x, 2.6.x, 3.x
Unix-like Systems: QNX 6, SCO OpenServer, UnixWare 7, Solaris 10
Note: Please refer to Moxa's website for the latest driver support information.

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 85°C (-4 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV

IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11

MTBF (mean time between failures)

Time:
CP-114EL: 2,347,197 hrs
CP-114EL-I: 603,671 hrs
Standard: Telcordia (Bellcore) TR/SR

Power Requirements

Input Current:
CP-114EL: 835 mA @ 3.3 VDC
CP-114EL-I: 1,170 mA @ 3.3 VDC

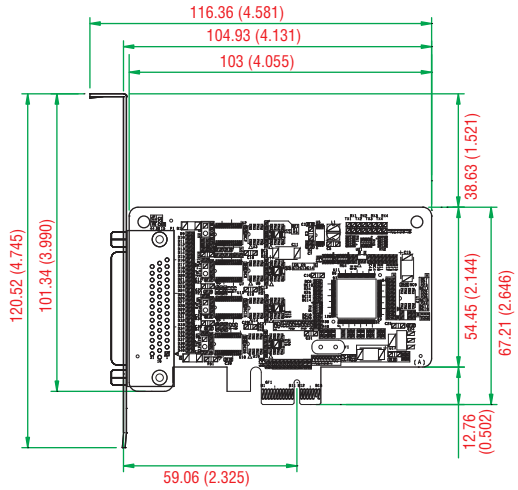
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

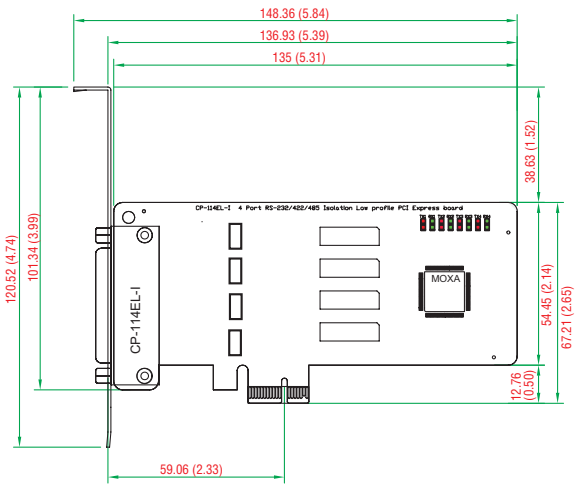
Dimensions

Unit: mm (inch)

CP-114EL



CP-114EL-I



Ordering Information

Available Models

CP-114EL: 4-port RS-232/422/485 low profile PCI Express x1 serial board
CP-114EL-I: 4-port RS-232/422/485 low profile PCI Express x1 serial board with electrical isolation
CP-114EL-DB9M: 4-port RS-232/422/485 low profile PCI Express x1 serial board (CBL-M44M9x4-50 cable included)
CP-114EL-DB25M: 4-port RS-232/422/485 low profile PCI Express x1 serial board (CBL-M44M25x4-50 cable included)
CP-114EL-I-DB9M: 4-port RS-232/422/485 low profile PCI Express x1 serial board with electrical isolation (CBL-M44M9x4-50 cable included)
CP-114EL-I-DB25M: 4-port RS-232/422/485 low profile PCI Express x1 serial board with electrical isolation (CBL-M44M25x4-50 cable included)

Package Checklist

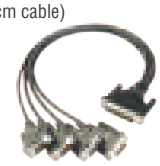
- 1 CP-114EL or CP-114EL-I board
- Low profile bracket
- 1 connection cable (optional)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Connection Options (can be purchased separately)

Low Profile Bracket: Bracket for DB44 connector (1490000001000)
CBL-M44M9x4-50: M44 to 4 x DB9-M cable, 50 cm
CBL-M44M25x4-50: M44 to 4 x DB25-M cable, 50 cm

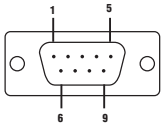
CBL-M44M9x4-50

DB44 male to DB9 male x 4 (50 cm cable)



PIN	RS-232	RS-422	RS-485-4w	RS-485-2w
1	DCD	TxD–(A)	TxD–(A)	–
2	RxD	TxD+(B)	TxD+(B)	–
3	TxD	RxD+(B)	RxD+(B)	Data+(B)
4	DTR	RxD–(A)	RxD–(A)	Data–(A)
5	GND	GND	GND	GND
6	DSR	–	–	–
7	RTS	–	–	–
8	CTS	–	–	–
9	–	–	–	–

DB9 male

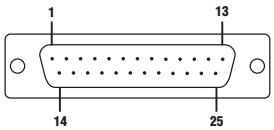


CBL-M44M25x4-50

DB44 male to DB25 male x 4 (50 cm cable)

PIN	RS-232	RS-422	RS-485-4w	RS-485-2w
2	TxD	RxD+(B)	RxD+(B)	Data+(B)
3	RxD	TxD+(B)	TxD+(B)	–
4	RTS	–	–	–
5	CTS	–	–	–
6	DSR	–	–	–
7	GND	GND	GND	GND
8	DCD	TxD–(A)	TxD–(A)	–
20	DTR	RxD–(A)	RxD–(A)	Data–(A)
22	–	–	–	–

DB25 male



CP-134EL-A-I

4-port RS-422/485 PCI Express board with 4 kV surge and 2 kV electrical isolation

- PCI Express x1 compliant
- Serial communication speed up to 921.6 kbps
- 128-byte FIFO and on-chip S/W flow control
- Variety of connection cables and boxes available for RS-232/422/485
- Drivers provided for the latest versions of Windows, Linux, and Unix
- Easy maintenance with on-board LED display and management software

PComm Lite

Overview

The CP-134EL-A-I is a smart PCI Express multiport serial board designed for POS and ATM applications, and for use by industrial automation system manufacturers and system integrators. The CP-134EL-A-I is compatible with all popular operating systems, and each of its 8 serial ports supports data rates of up to 921.6 kbps and provides full modem control signals, ensuring compatibility with a wide range of serial peripherals. In addition, the CP-134EL-A-I works with PCI Express x1, allowing the board to be installed in any PCI Express slot.

Intelligent RS-485 for Easy Installation and Troubleshooting (Patent Pending)

Setting up an RS-485 network is relatively straightforward. The challenge comes when the power is turned on and the devices connected to the network start transmitting and receiving data. In most cases, engineers will need to further tune the system by configuring pull high/low resistors and terminators at strategic points along the network. Moxa's new Intelligent RS-485 technology supports two essential features to make it easy: (1) One-Click Installation automatically analyzes the network topology and then adjusts terminators and pull high/low resistors. (2) One-Click Troubleshooting tells you what to change to make a deficient network viable.

Specifications

Hardware

Comm. Controller: 16C550C compatible
Bus: PCI Express x1
Connector: DB44 female

Serial Interface

Number of Ports: 4
Serial Standards: RS-422/485
Max. No. of Boards per PC: 4

Serial Line Protection

Surge Protection: 4 kV
Electrical Isolation: 2 kV

Performance

Baudrate: 50 bps to 921.6 kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF

Serial Signals

RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Physical Characteristics

Dimensions: 67.21 x 103 mm (2.65 x 4.06 in)

Driver Support

Windows: Windows 2000/XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64)
Linux: Linux 2.4.x, 2.6.x, 3.x
Unix-like Systems: QNX 6, SCO OpenServer, UnixWare 7, Solaris 10 (x86/x64)
Note: Please refer to Moxa's website for the latest driver support information.

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 85°C (-4 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 4 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11

MTBF (mean time between failures)

Time: 433,077 hrs
Standard: Telcordia (Bellcore) TR/SR

Power Requirements

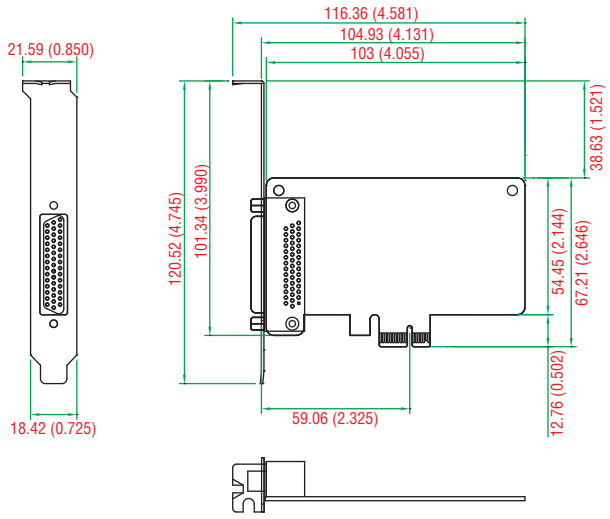
Input Current: 3,414 mA @ 3.3 VDC

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

CP-134EL-A-I: 4-port RS-422/485 low profile PCI Express x1 serial board w/ surge protection and electrical isolation
CP-134EL-A-I-DB9M: 4-port RS-422/485 low profile PCI Express x1 serial board w/ surge protection and electrical isolation, CBL-M44M9x4-50 cable included
CP-134EL-A-I-DB25M: 4-port RS-422/485 low profile PCI Express x1 serial board w/ surge protection and electrical isolation, CBL-M44M25x4-50 cable included

Connection Options (can be purchased separately)

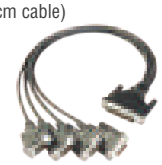
Low Profile Bracket: Bracket for DB44 connector (1490000001000)
CBL-M44M9x4-50: M44 to 4 x DB9-M cable, 50 cm
CBL-M44M25x4-50: M44 to 4 x DB25-M cable, 50 cm

Package Checklist

- 1 CP-134EL-A-I board
- Low profile bracket
- 1 connection cable (optional)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

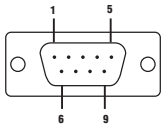
CBL-M44M9x4-50

DB44 male to DB9 male x 4 (50 cm cable)



PIN	RS-232	RS-422	RS-485-4w	RS-485-2w
1	DCD	TxD–(A)	TxD–(A)	–
2	RxD	TxD+(B)	TxD+(B)	–
3	TxD	RxD+(B)	RxD+(B)	Data+(B)
4	DTR	RxD–(A)	RxD–(A)	Data–(A)
5	GND	GND	GND	GND
6	DSR	–	–	–
7	RTS	–	–	–
8	CTS	–	–	–
9	–	–	–	–

DB9 male

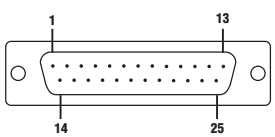


CBL-M44M25x4-50

DB44 male to DB25 male x 4 (50 cm cable)

PIN	RS-232	RS-422	RS-485-4w	RS-485-2w
2	TxD	RxD+(B)	RxD+(B)	Data+(B)
3	RxD	TxD+(B)	TxD+(B)	–
4	RTS	–	–	–
5	CTS	–	–	–
6	DSR	–	–	–
7	GND	GND	GND	GND
8	DCD	TxD–(A)	TxD–(A)	–
20	DTR	RxD–(A)	RxD–(A)	Data–(A)
22	–	–	–	–

DB25 male



CP-104EL-A

4-port RS-232 PCI Express serial board

- PCI Express x1 compliant
- 921.6 kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Low profile form factor fits small-sized PCs
- Drivers provided for a broad selection of operating systems, including the latest Windows and Linux
- Easy maintenance with on-board LEDs and management software

PComm Lite

Overview

The CP-104EL-A is a smart, 4-port PCI Express board designed for POS and ATM applications. It is a top choice of industrial automation engineers and system integrators, and supports many different operating systems, including Windows, Linux, and even Unix. In addition, each of the board's 4 RS-232 serial ports supports a super fast 921.6 kbps baudrate. The CP-104EL-A provides full modem control signals to ensure compatibility with a wide range of serial peripherals, and its PCI Express "x1" classification allows it to be installed in any PCI Express slot.

Smaller Form Factor

The CP-104EL-A is a low-profile board that is compatible with any PCI Express slot. The board requires only a 3.3 VDC power supply, which means that the board fits any host computer, ranging from shoebox to standard-sized PCs.

Drivers Provided for Windows, Linux, and Unix

Moxa continues to support a wide variety of operating systems, and the CP-104EL-A board is no exception. Reliable Windows and Linux/Unix drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware
Comm. Controller: 16C550C compatible
Bus: PCI Express x1
Connector: DB44 female

Serial Interface
Number of Ports: 4
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Performance
Baudrate: 50 bps to 921.6 kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Physical Characteristics
Dimensions: 67.21 x 103 mm (2.65 x 4.06 in)

Driver Support
Windows: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), DOS
Linux: Linux 2.4.x, 2.6.x, 3.x
Unix-like Systems: QNX 6, SCO OpenServer, UnixWare 7, Solaris 10
Note: Please refer to Moxa's website for the latest driver support information.

Environmental Limits
Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 85°C (-4 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B

EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11

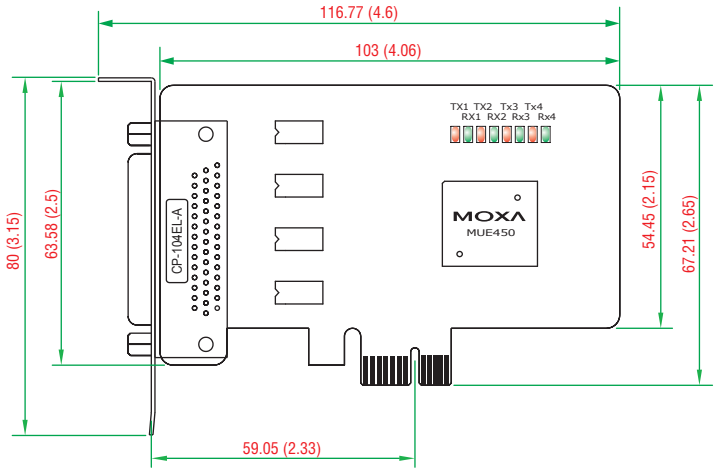
MTBF (mean time between failures)
Time: 3,601,447 hrs
Standard: Telcordia (Bellcore) TR/SR

Power Requirements
Input Current: 805 mA @ 3.3 VDC

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models
CP-104EL-A-DB9M: 4-port RS-232 PCI low profile Express x1 serial board (CBL-M44M9x4-50 cable included)
CP-104EL-A-DB25M: 4-port RS-232 low profile PCI Express x1 serial board (CBL-M44M25x4-50 cable included)

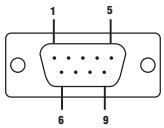
Connection Options (can be purchased separately)
Low Profile Bracket: Bracket for DB44 connector (1490000001000)
CBL-M44M9x4-50: M44 to 4 x DB9-M cable, 50 cm
CBL-M44M25x4-50: M44 to 4 x DB25-M cable, 50 cm

Package Checklist
- 1 CP-104EL-A board
- Low profile bracket
- 1 connection cable
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

CBL-M44M9x4-50
DB44 male to DB9 male x 4 (50 cm cable)

PIN	RS-232	PIN	RS-232
1	DCD	5	GND
2	RxD	6	DSR
3	TxD	7	RTS
4	DTR	8	CTS

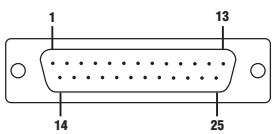
DB9 male



CBL-M44M25x4-50
DB44 male to DB25 male x 4 (50 cm cable)

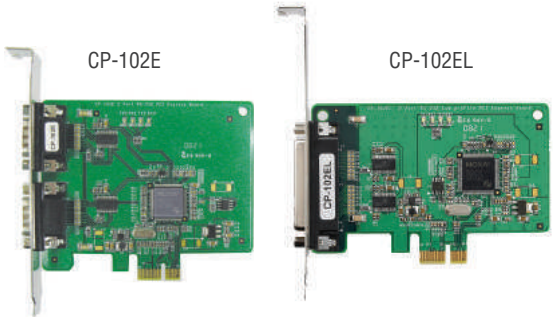
PIN	RS-232	PIN	RS-232
2	TxD	6	DSR
3	RxD	7	GND
4	RTS	8	DCD
5	CTS	20	DTR

DB25 male



CP-102E/EL

2-port RS-232 PCI Express boards



- PCI Express x1 compliant
- 921.6 kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Low profile form factor fits small-sized PCs
- Drivers provided for a broad selection of operating systems, including the latest Windows and Linux

PComm Lite

Overview

The CP-102E and low-profile CP-102EL are 2-port PCI Express boards designed for POS and ATM applications. Moxa's PCI Express boards are a top choice of industrial automation engineers and system integrators, particularly since the boards support many different operating systems, including Windows and Linux. The CP-102E/EL's 2 RS-232 serial ports support a superfast 921.6 kbps baudrate and provide full modem control signals to ensure compatibility with a wide range of serial peripherals. In addition, the boards' x1 classification allows them to be installed in any PCI Express slot.

Smaller Form Factor

The CP-102EL is a low-profile board that is compatible with any PCI Express slot. The CP-102EL board only requires a 3.3 VDC power supply, which means that the board fits any host computer, ranging from shoebox to standard-sized PCs.

Drivers Provided for Windows, Linux, and Unix

Moxa continues to support a wide variety of operating systems, and the CP-102E/EL boards are no exception. Reliable Windows and Linux drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration applications.

Specifications

Hardware

Comm. Controller: 16C550C compatible
Bus: PCI Express x 1
Connector: CP-102E: DB9 male x 2
CP-102EL: DB25 female

Serial Interface

Number of Ports: 2
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Performance

Baudrate: 50 bps to 921.6 kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Physical Characteristics

Dimensions:
CP-102E: 85.04 x 100 mm (3.35 x 3.94 in)
CP-102EL: 67.21 x 100 mm (2.65 x 3.94 in)

Driver Support

Windows: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), DOS
Linux: Linux 2.4.x, 2.6.x, 3.x
Unix-like Systems: QNX 6, SCO OpenServer, UnixWare 7, Solaris 10
Note: Please refer to Moxa's website for the latest driver support information.

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 85°C (-4 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: EN 55022/24
EMI: CP-102E: CISPR 22, FCC Part 15B Class A
CP-102EL: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11

MTBF (mean time between failures)

Time: 4,947,552 hrs
Standard: Telcordia (Bellcore) TR/SR

Power Requirements

Input Current:
CP-102E: 520 mA @ 3.3 VDC
CP-102EL: 552 mA @ 3.3 VDC

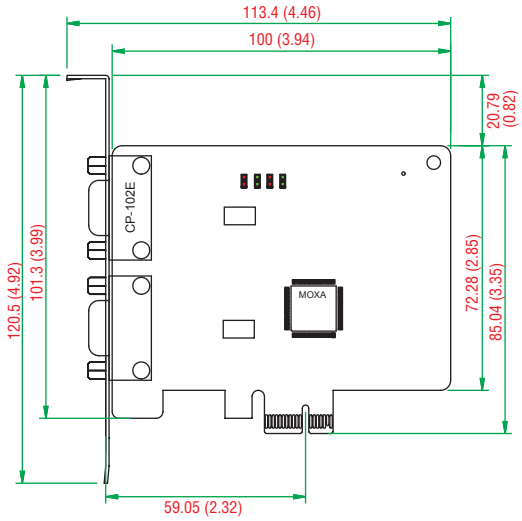
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

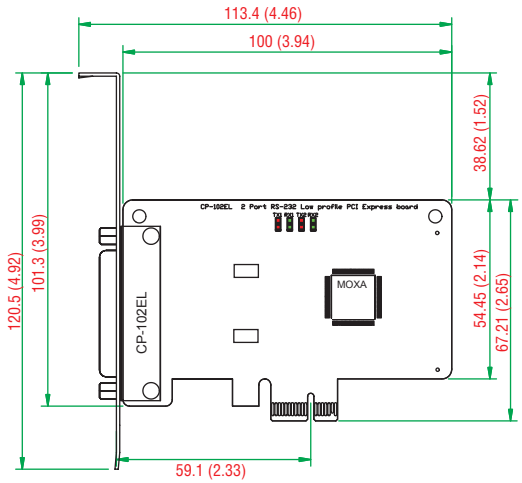
Dimensions

Unit: mm (inch)

CP-102E



CP-102EL



Ordering Information

Available Models

CP-102E: 2-port RS-232 PCI Express x1 serial board
CP-102EL-DB9M: 2-port RS-232 low profile PCI Express serial board (CBL-M25M9x2-50 cable included)

Connection Options (can be purchased separately)

Low Profile Bracket: Bracket for DB44 connector (1490000001000)
CBL-M25M9x2-50: M25 to 2 x DB9-M cable, 50 cm

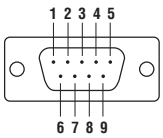
Package Checklist

- 1 CP-102E or CP-102EL board
- Low profile bracket (CP-102EL only)
- 1 connection cable (optional)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

CBL-M25M9x2-50
DB25 male to DB9 male x 2 (50 cm cable)

PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

DB9 male



CP-132EL/EL-I

2-port RS-422/485 PCI Express boards with optional 2 kV isolation

CP-132EL

CP-132EL-I

- PCI Express x1 compliant
- 921.6 kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip S/W flow control
- Low profile form factor fits small-sized PCs
- Drivers provided for a broad selection of operating systems, including the latest Windows and Linux

PComm Lite

Overview

The CP-132EL and CP-132EL-I are 2-port PCI Express boards designed for industrial automation applications that require a long distance, multipoint, PC-based data acquisition solution.

RS-485 multidrop for up to 31 devices within 1.2 km

The CP-132EL/EL-I boards have 2 RS-422/485 serial ports, each of which can achieve data rates up to 921.6 kbps. In RS-485 mode, the boards can connect up to 31 daisy-chained RS-485 devices within a range of 1.2 km. For long distance RS-485 communication, choose the CP-132EL-I model, which comes with 2 kV electrical isolation protection to prevent equipment damage.

Drivers Provided for Windows, Linux, and Unix

Moxa continues to support a wide variety of operating systems, and the CP-132EL/EL-I boards are no exception. Reliable Windows and Linux drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware

Comm. Controller: 16C550C compatible
Bus: PCI Express x1
Connector: DB25 female

Serial Interface

Number of Ports: 2
Serial Standards: RS-422/485
Max. No. of Boards per PC: 4

Serial Line Protection

Electrical Isolation: 2 kV (CP-132EL-I only)

Performance

Baudrate: 50 bps to 921.6 kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: XON/XOFF

Serial Signals

RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Physical Characteristics

Dimensions:
CP-132EL: 67.21 x 101.97 mm (2.65 x 4.08 in)
CP-132EL-I: 67.21 x 103.97 mm (2.65 x 4.16 in)

Driver Support

Windows: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), DOS
Linux: Linux 2.4.x, 2.6.x, 3.x
Unix-like Systems: QNX 6, SCO OpenServer, UnixWare 7, Solaris 10
Note: Please refer to Moxa's website for the latest driver support information.

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 85°C (-4 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11

MTBF (mean time between failures)

Time:
CP-132EL: 4,147,133 hrs
CP-132EL-I: 1,681,099 hrs
Standard: Telcordia (Bellcore) TR/SR

Power Requirements

Input Current:
CP-132EL: 548 mA @ 3.3 VDC
CP-132EL-I: 636 mA @ 3.3 VDC

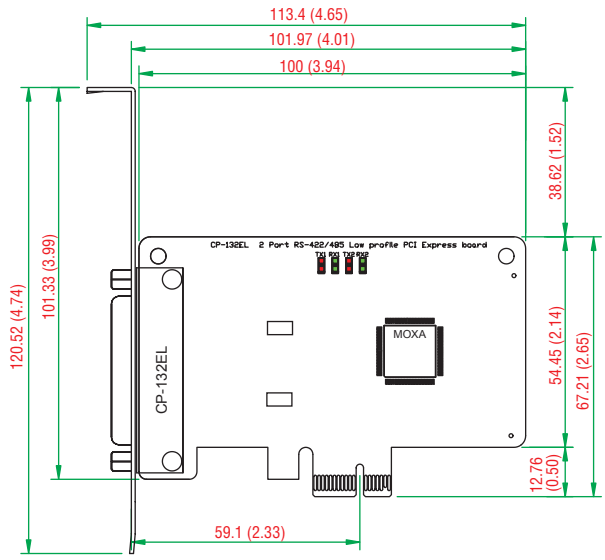
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

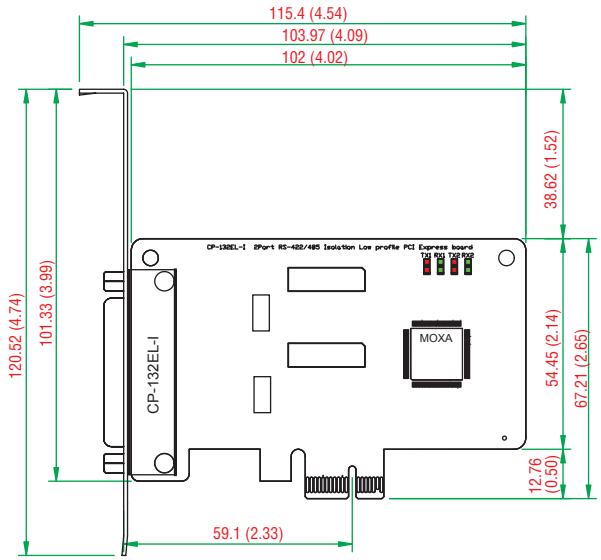
Dimensions

Unit: mm (inch)

CP-132EL



CP-132EL-I



Ordering Information

Available Models

CP-132EL-DB9M: 2-port RS-422/485 low profile PCI Express x1 serial board (CBL-M25M9x2-50 cable included)
CP-132EL-I-DB9M: 2-port RS-422/485 low profile PCI Express x1 serial board with electrical isolation (CBL-M25M9x2-50 cable included)

Connection Options (can be purchased separately)

Low Profile Bracket: Bracket for DB44 connector (3095010000007)
CBL-M25M9x2-50: M25 to 2 x DB9-M cable, 50 cm

Package Checklist

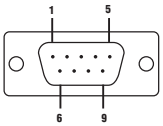
- 1 CP-132EL or CP-132EL-I board
- Low profile bracket
- 1 connection cable (optional)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

CBL-M25M9x2-50

DB25 male to DB9 male x 2 (50 cm cable)

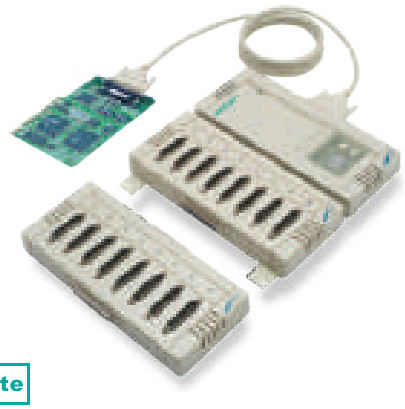
PIN	RS-422/RS-485-4w	RS-485-2w
1	TxD–(A)	–
2	TxD+(B)	–
3	RxD+(B)	Data+(B)
4	RxD–(A)	Data–(A)
5	GND	GND
6	–	–
7	–	–
8	–	–

DB9 male



C320Turbo Series

8 to 32-port intelligent RS-232 Universal PCI serial boards



PComm Lite

- Supports 128 high-performance serial ports per system
- Dramatically decreases host CPU load
- Modular design makes port expansion easy
- Monitor transmission status with LEDs on the module and two 7-segment displays
- Drivers provided for a broad selection of operating systems
- 460.8 kbps maximum baudrate

Overview

The intelligent C320Turbo serial boards are expandable and flexible COM/TTY solutions for RS-232 applications that require connecting up to 128 serial devices to one computer. The C320Turbo's on-board CPU and large dual-port memory take the load off host systems whose performance and scalability are critical for large-scale systems.

Specifications

Hardware
Comm. Controller: 16C550C or compatible x 8
Bus: 32-bit Universal PCI
Connector: DB25 female
Processor: TMS320BC52-40 RISC CPU
Memory: 512 KB

Serial Interface
Number of Ports: 32 per control board (max.)
Serial Standards: RS-232 (RS-422 available with desktop option)
Max. No. of Boards per PC: 4

Performance
Baudrate: 50 bps to 460.8 kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+/-, RxD+/-, RTS+/-, CTS+/-, GND

Physical Characteristics
Dimensions: 90 x 120 mm (3.54 x 4.72 in)

Driver Support
Windows: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), DOS, Windows Embedded CE 5.0/6.0, Windows XP Embedded
Linux: Linux 2.4.x, 2.6.x, 3.x
Unix-like Systems: QNX 6, SCO OpenServer, UnixWare 7, Solaris 10, FreeBSD
Note: Please refer to Moxa's website for the latest driver support information.

Environmental Limits
Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 55°C (-4 to 131°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11

MTBF (mean time between failures)
Time: 305,270 hrs
Standard: MIL-HDBK-217F

Power Requirements
Input Current: 500 mA @ 5 VDC

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

	C32010T/ PCI	C32030T	C32045T	C32047T	C32061T
Dimensions	120 x 90 x 15 mm (4.73 x 3.55 x 0.59 in)	247 x 108 x 35 mm (9.73 x 4.25 x 1.38 in)	247 x 108 x 35 mm (9.73 x 4.25 x 1.38 in)	247 x 108 x 35 mm (9.73 x 4.25 x 1.38 in)	247 x 108 x 35 mm (9.73 x 4.25 x 1.38 in)
Weight	90 g (0.21 lb)	425 g (0.94 lb)	500 g (1.11 lb)	485 g (1.07 lb)	488 g (1.08 lb)
Input Current	0.5 A @ +5 VDC	0.59 A @ +5 VDC	0.28 A @ +5 VDC 0.095 A @ +12 VDC 0.06 A @ -12 VDC	0.28 A @ +5 VDC 0.095 A @ +12 VDC 0.06 A @ -12 VDC	0.485 A @ +5 VDC

	C32065T	C32071T	C32080T	C32081T	C32082T	C32083T
Dimensions	247 x 108 x 35 mm (9.73 x 4.25 x 1.38 in)	247 x 108 x 35 mm (9.73 x 4.25 x 1.38 in)	277 x 165 x 44 mm (10.91 x 6.51 x 1.74 in)	277 x 165 x 44 mm (10.91 x 6.51 x 1.74 in)	277 x 165 x 44 mm (10.91 x 6.51 x 1.74 in)	277 x 165 x 44 mm (10.91 x 6.51 x 1.74 in)
Weight	525 g (1.16 lb)	525 g (1.16 lb)	1,020 g (2.25 lb)	1,120 g (2.47 lb)	920 g (2.03 lb)	1,000 g (2.21 lb)
Input Current	1.32 A @ +5 VDC	0.28 A @ +5 VDC 0.095 A @ +12 VDC 0.06 A @ -12 VDC	0.88 A @ +5 VDC 0.095 A @ +12 VDC 0.06 A @ -12 VDC	1.22 A @ +5 VDC 0.19 A @ +12 VDC 0.12 A @ -12 VDC	0.34 A @ +5 VDC 0.095 A @ +12 VDC 0.06 A @ -12 VDC	0.67 A @ +5 VDC 0.19 A @ +12 VDC 0.12 A @ -12 VDC

Ordering Information

Package Checklist

- 1 C320Turbo/PCI board
- Long-range extension kit (optional)
- Documentation and software CD
- Quick installation guide (printed)
- Quick installation guide (printed)
- Warranty card

Available Models

Control Boards (must choose one)

C32010T/PCI: Universal PCI board

External Modules

Rackmount Option

Basic Modules (must choose one)

C32080T: 8 RS-232 ports, 10-pin RJ45 connectors
C32081T: 16-port, RS-232, 10-pin RJ45

Expansion Modules (optional)

C32082T: 8 RS-232 ports, 10-pin RJ45 connectors
C32083T: 16 RS-232 ports, 10-pin RJ45 connectors

Long-range Extension Kit (optional)

C32050T: Includes the following items

- 2-meter DB25-M to DB25-F 10-wire cable (generally used for set-up)
- 90 to 240 VAC switching power adaptor (0 to 30°C operating temperature)

NOTE: Build your own DB25-M to DB25-F 10-wire cable for connecting up to 100 meters.

Desktop Option

- CPU module
- One or more UART modules (32 ports maximum per board)

Rackmount Option

- Basic module
- Zero or more expansion modules (32 ports maximum per board)

Connection Cable (required)

C32020T: 2-meter DB25-M to DB25-F cable with 25 pins for short-range usage

Desktop Option

CPU Module (required)

C32030T: Connects directly to one UART module

8-port UART Modules (choose at least one)

C32045T: RS-232, DB25-F connectors
C32047T: RS-232, DB25-M connectors
C32071T: RS-232, DB25-F connectors
C32061T: RS-422, DB25-F connectors
C32065T: RS-422, DB25-F connectors (2 kV electrical isolation)

Ordering Examples

Rackmount Ordering Examples

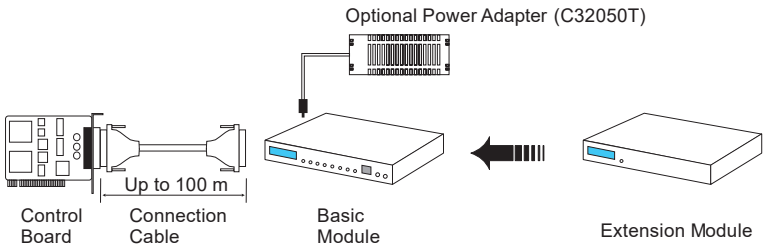
16 RS-232 ports

Control Board: C32010T/PCI
Connection Cable: C32020T
Basic Module: C32081T

32 RS-232 ports

Control Board: C32010T/PCI
Connection Cable: C32020T
Basic Module: C32081T x 1
Expansion Module: C32083T x 1

Rackmount Setup Diagram



Desktop Ordering Examples

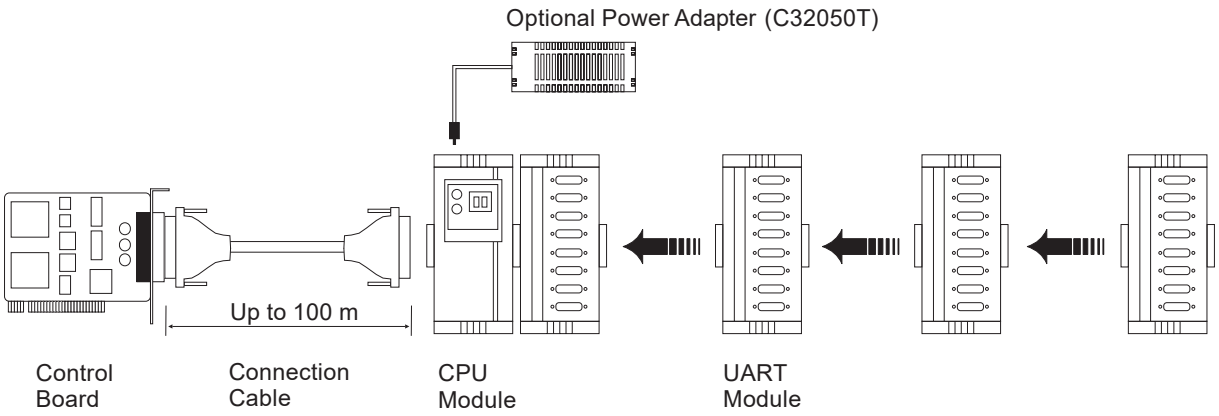
8 RS-232 ports

Control Board: C32010T/PCI
Connection Cable: C32020T
CPU Module: C32030T
UART Module: C32045T x 1

8 RS-232 ports + 16 RS-422 ports

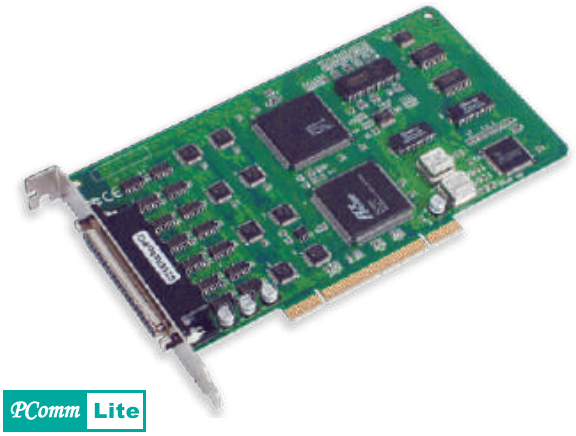
Control Board: C32010T/PCI
Connection Cable: C32020T
CPU Module: C32030T
UART Module: C32045T x 1 + C32061T x 2

Desktop Setup Diagram



C218Turbo Series

8-port RS-232 intelligent Universal PCI serial boards



PComm Lite

- Effectively reduces CPU loading
- Drivers provided for a variety of operating systems (Windows, Linux, and Unix)
- Choose from a wide range of connection cables and boxes
- 921.6 kbps maximum baudrate for super fast data transmission
- Provides up to 512 KB of embedded memory
- High data throughput for great performance

Introduction

The 8-port C218Turbo RS-232 universal PCI board comes with an ASIC, RISC processor, and large I/O buffer to provide a sustained high throughput on all 8 ports simultaneously. Drivers are available for Windows, Linux, and Unix, making the boards suitable for a wide range of applications. Models are available for PCI and PCI-X buses to provide reliable, high-performance solutions for multiport serial communications.

Specifications

Hardware

Comm. Controller: 16C550C or compatible x 8
Bus: 32-bit Universal PCI
Connector: DB62 female
Processor: TMS320BC203-57 RISC CPU
Memory: 512 KB

Serial Interface

Number of Ports: 8
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Serial Line Protection

Optical Isolation: 500 V with connection box Opt8F (must be purchased separately)

Performance

Baudrate: 50 bps to 921.6 kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Physical Characteristics

Dimensions: 105 x 180 mm (4.13 x 7.09 in)

Driver Support

Windows: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), DOS, Windows Embedded CE 5.0/6.0, Windows XP Embedded
Linux: Linux 2.4.x, 2.6.x, 3.x
Unix-like Systems: QNX 6, SCO OpenServer, UnixWare 7, Solaris 10, FreeBSD
Note: Please refer to Moxa's website for the latest driver support information.

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 85°C (-4 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11

MTBF (mean time between failures)

Time: 303,325 hrs
Standard: MIL-HDBK-217F

Power Requirements

Input Current:
530 mA @ +5 VDC
110 mA @ +12 VDC
35 mA @ -12 VDC

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models

C218Turbo/PCI: 8-port RS-232 intelligent Universal PCI serial board

Connection Options (can be purchased separately)

CBL-M62M9x8-100: M62 to 8 x DB9-M cable, 100 cm
CBL-M62M25x8-100: M62 to 8 x DB25-M cable, 100 cm

Optional Connectors (choose one per board)

OPT8A: M62 to 8 x DB25-F connection box w/ 150 cm DB62-M to DB62-F cable
OPT8B: M62 to 8 x DB25-M connection box w/ 150 cm DB62-M to DB62-F cable
OPT8S: M62 to 8 x DB25-F connection box w/ surge protection, and 150 cm DB62-M to DB62-F cable
OPT8-M9: M62 to 8 x DB9-M connection box w/ 150 cm DB62-M to DB62-F cable
OPT8-RJ45: M62 to 8 x RJ45 (8-pin) connection box w/ 30 cm cable

Package Checklist

- 1 C218Turbo/PCI board
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

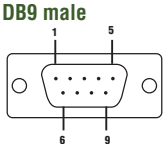
OPT8-M9
DB9 male x 8 (150 cm cable)

CBL-M62M9x8-100
DB9 male x 8 (100 cm cable)

PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR

PIN	RS-232
5	GND
6	DSR
7	RTS
8	CTS

DB9 male



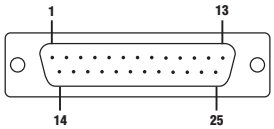
OPT8B
DB25 male x 8 (150 cm cable)

CBL-M62M25x8-100
DB25 male x 8 (100 cm cable)

PIN	RS-232
2	TxD
3	RxD
4	RTS
5	CTS

PIN	RS-232
6	DSR
7	GND
8	DCD
20	DTR

DB25 male



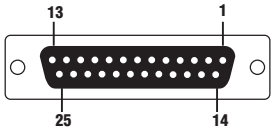
OPT8A
DB25 female x 8 (150 cm cable)

OPT8S
DB25 female x 8 (150 cm cable)

PIN	RS-232
2	RxD
3	TxD
4	CTS
5	RTS

PIN	RS-232
6	DTR
7	GND
8	DCD
20	DSR

DB25 female

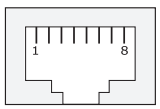


OPT8-RJ45
8-pin RJ45 x 8 (30 cm cable)

PIN	RS-232
1	DSR
2	RTS
3	GND
4	TxD

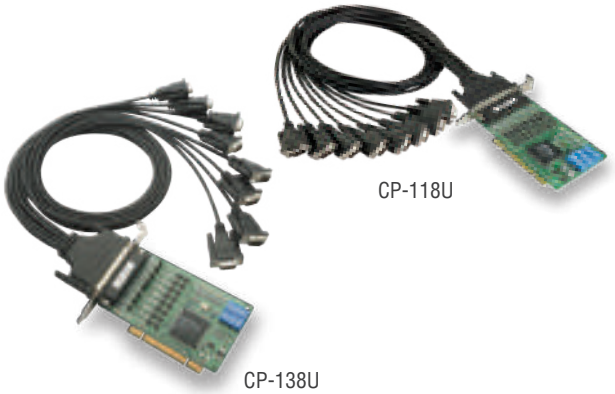
PIN	RS-232
5	RxD
6	DCD
7	CTS
8	DTR

8-pin RJ45



CP-118U/138U

8-port RS-232/422/485 Universal PCI serial boards



- Over 700 kbps data throughput for top performance
- 921.6 kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Compatible with 3.3/5 V PCI and PCI-X
- Drivers provided for a broad selection of operating systems, including the latest Windows and Linux
- Easy maintenance with on-board LED display, and management software
- Wide temperature model available for -40 to 85°C environments

PComm Lite

Overview

The CP-118U and CP-138U are smart, 8-port Universal PCI serial boards designed for POS and ATM applications and for use by industrial automation system manufacturers and system integrators. Both boards are compatible with all major operating systems. In addition, the CP-118U's 8 RS-232/422/485 ports and the CP-138U's 8 RS-422/485 ports support data rates up to 921.6 kbps and provide full modem control signals to ensure compatibility with a wide range of serial peripherals. The CP-118U and CP-138U support both 3.3 V and 5 V PCI buses, making them suitable for installation in most PC servers.

Drivers Provided for Windows and Linux

One of Moxa's highest priorities is to provide drivers for all mainstream operating systems. Reliable, well-tested Windows and Linux/Unix drivers are available for use with the CP-118U and CP-138U serial boards. Other operating systems, such as Windows XP embedded and WEPOS, are also supported to accommodate embedded integration applications.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connector: DB62 female

Serial Interface

Number of Ports: 8
Serial Standards:
CP-118U: RS-232/422/485
CP-138U: RS-422/485
Max. No. of Boards per PC: 4

Performance

Baudrate: 50 bps to 921.6 kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Physical Characteristics

Dimensions: 82 x 135 mm (3.22 x 5.31 in)

Driver Support

Windows: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), DOS, Windows Embedded CE 5.0/6.0, Windows XP Embedded
Linux: Linux 2.4.x, 2.6.x, 3.x
Unix-like Systems: QNX 6, SCO OpenServer, UnixWare 7, Solaris 10, FreeBSD
Note: Please refer to Moxa's website for the latest driver support information.

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m

MTBF (mean time between failures)

Time:
CP-118U: 1,073,385 hrs
CP-138U: 1,147,210 hrs
Standard: Telcordia (Bellcore) SR-332

Power Requirements

Input Current:
CP-118U: 240 mA @ 5 VDC (RS-232); 300 mA @ 5 VDC (RS-422)
CP-138U: 135 mA @ 5 VDC (RS-422)

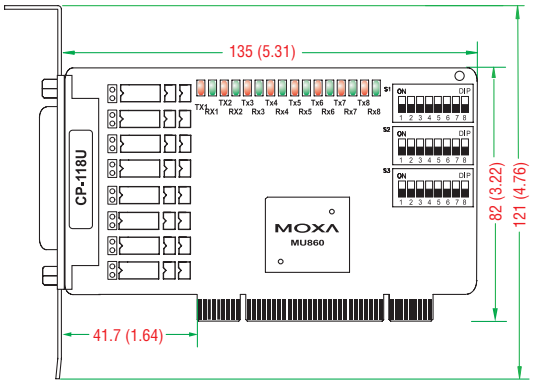
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

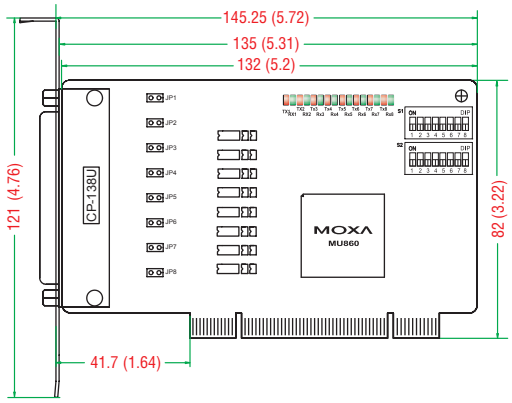
Dimensions

Unit: mm (inch)

CP-118U



CP-138U



Ordering Information

Available Models

CP-118U: 8-port RS-232/422/485 Universal PCI serial board, 0 to 55°C operating temperature
CP-138U: 8-port RS-422/485 Universal PCI serial board, 0 to 55°C operating temperature
CP-118U-T: 8-port RS-232/422/485 Universal PCI serial board, -40 to 85°C operating temperature
CP-138U-T: 8-port RS-422/485 Universal PCI serial board, -40 to 85°C operating temperature

Connection Options (can be purchased separately)

CBL-M68M9x8-100: SCSI VHDCI 68 to 8 x DB9-M cable, 100 cm
CBL-M68M25x8-100: SCSI VHDCI 68 to 8 x DB25-M cable, 100 cm

Optional Connectors (choose one per board)

OPT8-M9+: VHDCI 68 to 8 x DB9-M connection box
OPT8B+: VHDCI 68 to 8 x DB25-M connection box
OPT8A+: VHDCI 68 to 8 x DB25-F connection box
OPT8-RJ45+: VHDCI 68 to 8 x RJ45 (8-pin) connection box
OPT8S+: VHDCI 68 to 8 x DB25-F connection box w/ surge protection

Package Checklist

- 1 CP-118U or CP-138U board
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

OPT8-M9

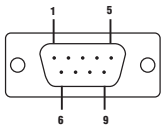
DB9 male x 8 (150 cm cable)

CBL-M62M9x8-100 (OPT8D)

DB9 male x 8 (100 cm cable)

PIN	RS-232	PIN	RS-232
1	DCD	5	GND
2	RxD	6	DSR
3	TxD	7	RTS
4	DTR	8	CTS

DB9 male



OPT8B

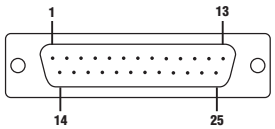
DB25 male x 8 (150 cm cable)

CBL-M62M25x8-100 (OPT8C)

DB25 male x 8 (100 cm cable)

PIN	RS-232	PIN	RS-232
2	TxD	6	DSR
3	RxD	7	GND
4	RTS	8	DCD
5	CTS	20	DTR

DB25 male



OPT8A

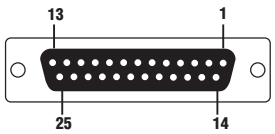
DB25 female x 8 (150 cm cable)

OPT8S

DB25 female x 8 (150 cm cable)

PIN	RS-232	PIN	RS-232
2	RxD	6	DTR
3	TxD	7	GND
4	CTS	8	DCD
5	RTS	20	DSR

DB25 female

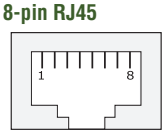


OPT8-RJ45

8-pin RJ45 x 8 (30 cm cable)

PIN	RS-232	PIN	RS-232
1	DSR	5	RxD
2	RTS	6	DCD
3	GND	7	CTS
4	TxD	8	DTR

8-pin RJ45



CP-118U-I/138U-I

8-port RS-232/422/485 Universal PCI serial boards with 2 kV isolation

- Over 700 kbps data throughput for top performance
- 921.6 kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Compatible with 3.3/5 V PCI and PCI-X
- Drivers provided for a broad selection of operating systems, including the latest Windows and Linux
- Easy maintenance with on-board LED display, and management software
- Wide temperature model available for -40 to 85°C environments

Overview

The CP-118U-I and CP-138U-I are 8-port serial boards designed for long distance, multipoint, PC-based data acquisition applications. Industrial automation system integrators will be eager to use these boards for many of their industrial automation projects.

On-chip ADDC® for precise RS-485 communication

RS-485 communication requires precise timing control to enable and disable the line driver, and the Moxa Turbo Serial Engine™ chip that powers the CP-118U-I and CP-138U-I boards come with on-chip ADDC® (automatic data direction control) to make RS-485 as easy to use as RS-232.

RS-485 multidrop for up to 31 devices within 1.2 km

The CP-118U-I's 8 RS-232/422/485 ports and the CP-138U-I's 8 RS-422/485 ports can achieve data rates up to 921.6 kbps, and in RS-485 mode, one serial port can connect up to 31 daisy-chained RS-485 devices within a range of 1.2 km. In addition, the 2 kV electrical isolation protection on the CP-118U-I and CP-138U-I boards helps prevent equipment damage for long distance RS-485 communication.

Top Serial Performance

With 20-plus years of experience in serial board design, Moxa is now concentrating on a new high-performance serial data transmission chip. The Turbo Serial Engine™ chip provides serial boards with a 128-byte FIFO, on-chip hardware and software flow control, and burst data mode. Thanks to the Turbo Serial Engine™, Moxa is able to offer the world's best performing smart serial boards.

Drivers Provided for Windows, Linux, and Unix

Moxa continues to support a wide variety of operating systems, and the CP-118U-I and CP-138U-I boards are no exception. Reliable Windows and Linux/Unix drivers are provided for most Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connector: DB78 female

Serial Interface

Number of Ports: 8
Serial Standards:
CP-118U-I: RS-232/422/485
CP-138U-I: RS-422/485
Max. No. of Boards per PC: 4

Serial Line Protection

Electrical Isolation: 2 kV

Performance

Baudrate: 50 bps to 921.6 kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Physical Characteristics

Dimensions: 105 x 133 mm (4.13 x 5.23 in)

Driver Support

Windows: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), DOS, Windows Embedded CE 5.0/6.0, Windows XP Embedded
Linux: Linux 2.4.x, 2.6.x, 3.x

Unix-like Systems: QNX 6, SCO OpenServer, UnixWare 7, Solaris 10, FreeBSD

Note: Please refer to Moxa's website for the latest driver support information.

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
CP-118U-I:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
CP-138U-I:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power 1 kV

MTBF (mean time between failures)

Time:
CP-118U-I: 350,975 hrs
CP-138U-I: 370,390 hrs
Standard: Telcordia (Bellcore) SR-332

Power Requirements

Input Current:
CP-118U-I: 860 mA @ 5 VDC
CP-138U-I: 330 mA @ 5 VDC

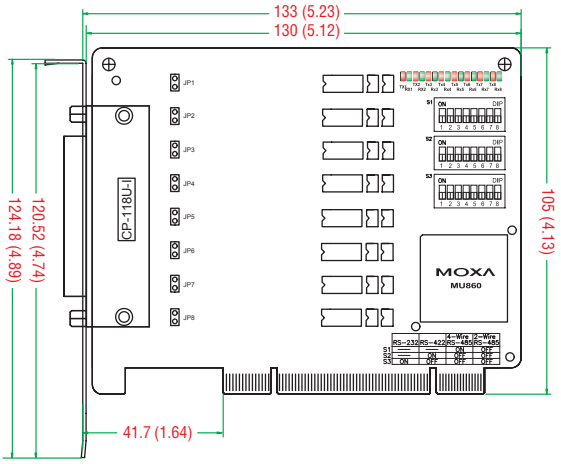
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

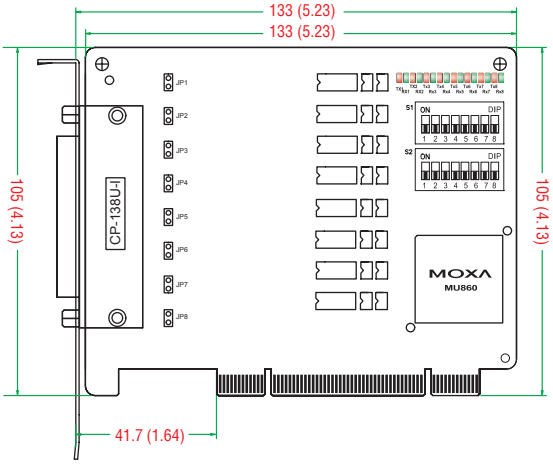
Dimensions

Unit: mm (inch)

CP-118U-I



CP-138U-I



Ordering Information

Available Models

CP-118U-I: 8-port RS-232/422/485 Universal PCI serial board with electrical isolation, 0 to 55°C operating temperature
CP-138U-I: 8-port RS-422/485 Universal PCI serial board with electrical isolation, 0 to 55°C operating temperature
CP-118U-I-T: 8-port RS-232/422/485 Universal PCI serial board with electrical isolation, -40 to 85°C operating temperature
CP-138U-I-T: 8-port RS-422/485 Universal PCI serial board with electrical isolation, -40 to 85°C operating temperature

Package Checklist

- 1 CP-118U-I or CP-138U-I board
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Connection Options (can be purchased separately)

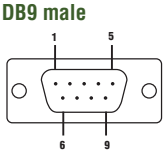
CBL-M68M9x8-100: SCSI VHDCI 68 to 8 x DB9-M cable, 100 cm
CBL-M68M25x8-100: SCSI VHDCI 68 to 8 x DB25-M cable, 100 cm

Optional Connectors (choose one per board)

OPT8-M9+: VHDCI 68 to 8 x DB9-M connection box
OPT8B+: VHDCI 68 to 8 x DB25-M connection box
OPT8A+: VHDCI 68 to 8 x DB25-F connection box
OPT8-RJ45+: VHDCI 68 to 8 x RJ45 (8-pin) connection box
OPT8S+: VHDCI 68 to 8 x DB25-F connection box w/ surge protection

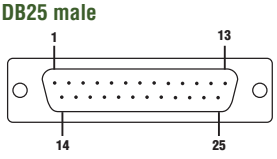
CBL-M78M9x8-100

DB9 male



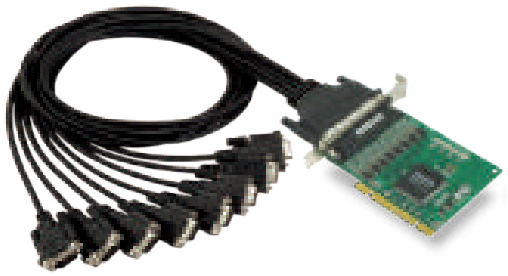
CBL-M78M25x8-100

DB25 male



CP-168U

8-port RS-232 Universal PCI serial board



- Over 700 kbps data throughput for top performance
- 921.6 kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Choose from a wide range of connection cables and boxes
- Compatible with 3.3/5 V PCI and PCI-X
- Drivers provided for a broad selection of operating systems, including the latest Windows and Linux
- Wide temperature model available for -40 to 85°C environments

Introduction

The CP-168U is a smart, 8-port universal PCI board designed for POS and ATM applications. It is a top choice of industrial automation engineers and system integrators, and supports many different operating systems, including Windows, Linux, and even Unix. In addition, each of the board's 8 RS-232 serial ports supports a superfast 921.6 kbps baudrate. The CP-168U provides full modem control signals to ensure compatibility with a wide range of serial peripherals, and it works with both 3.3 V and 5 V PCI buses, allowing the board to be installed in virtually any available PC server.

Specifications

Hardware
Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connector: DB62 female

Serial Interface
Number of Ports: 8
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Serial Line Protection
Electrical Isolation: 500 V with connection box Opt8F (must be purchased separately)

Performance
Baudrate: 50 bps to 921.6 kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Physical Characteristics
Dimensions: 82 x 120 mm (3.22 x 4.72 in)

Driver Support
Windows: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), DOS, Windows Embedded CE 5.0/6.0, Windows XP Embedded
Linux: Linux 2.4.x, 2.6.x, 3.x
Unix-like Systems: QNX 6, SCO OpenServer, UnixWare 7, Solaris 10, FreeBSD
Note: Please refer to Moxa's website for the latest driver support information.

Environmental Limits
Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV

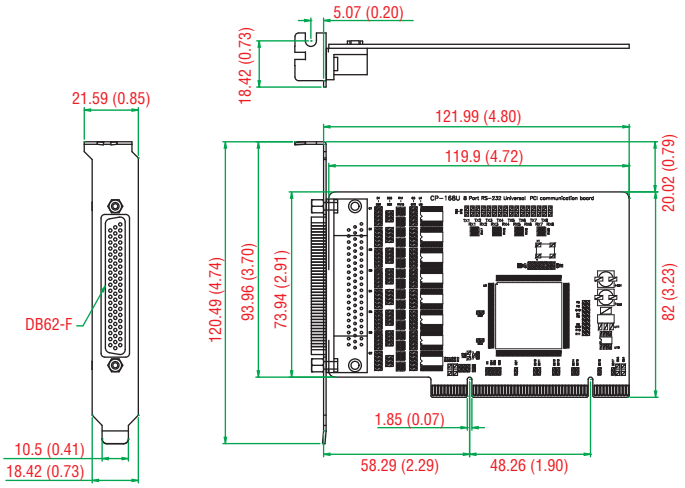
MTBF (mean time between failures)
Time: 280,854 hrs
Standard: Telcordia (Bellcore) TR/SR

Power Requirements
Input Current: 180 mA @ 5 VDC

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

CP-168U: 8-port RS-232 Universal PCI serial board, 0 to 55°C operating temperature
CP-168U-T: 8-port RS-232 Universal PCI serial board, -40 to 85°C operating temperature

Connection Options (can be purchased separately)

CBL-M62M9x8-100: M62 to 8 x DB9-M cable, 100 cm
CBL-M62M25x8-100: M62 to 8 x DB25-M cable, 100 cm

Optional Connectors (choose one per board)

OPT8A: M62 to 8 x DB25-F connection box w/ 150 cm DB62-M to DB62-F cable
OPT8B: M62 to 8 x DB25-M connection box w/ 150 cm DB62-M to DB62-F cable
OPT8S: M62 to 8 x DB25-F connection box w/ surge protection, and 150 cm DB62-M to DB62-F cable
OPT8-M9: M62 to 8 x DB9-M connection box w/ 150 cm DB62-M to DB62-F cable
OPT8-RJ45: M62 to 8 x RJ45 (8-pin) connection box w/ 30 cm cable

Package Checklist

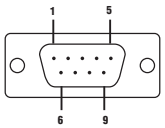
- 1 CP-168U board
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

OPT8-M9
DB9 male x 8 (150 cm cable)

CBL-M62M9x8-100 (OPT8D)
DB9 male x 8 (100 cm cable)

PIN	RS-232	PIN	RS-232
1	DCD	5	GND
2	RxD	6	DSR
3	TxD	7	RTS
4	DTR	8	CTS

DB9 male

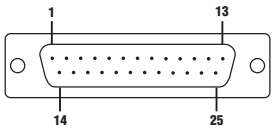


OPT8B
DB25 male x 8 (150 cm cable)

CBL-M62M25x8-100 (OPT8C)
DB25 male x 8 (100 cm cable)

PIN	RS-232	PIN	RS-232
2	TxD	6	DSR
3	RxD	7	GND
4	RTS	8	DCD
5	CTS	20	DTR

DB25 male

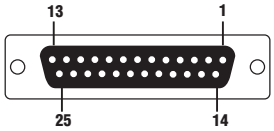


OPT8A
DB25 female x 8 (150 cm cable)

OPT8S
DB25 female x 8 (150 cm cable)

PIN	RS-232	PIN	RS-232
2	RxD	6	DTR
3	TxD	7	GND
4	CTS	8	DCD
5	RTS	20	DSR

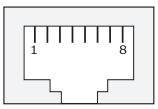
DB25 female



OPT8-RJ45
8-pin RJ45 x 8 (30 cm cable)

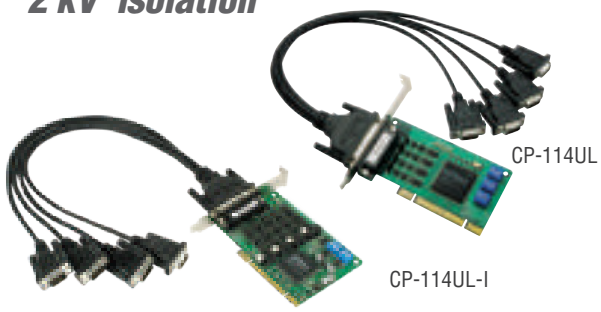
PIN	RS-232	PIN	RS-232
1	DSR	5	RxD
2	RTS	6	DCD
3	GND	7	CTS
4	TxD	8	DTR

8-pin RJ45



CP-114UL/UL-I

4-port RS-232/422/485 Universal PCI serial boards with optional 2 kV isolation



- Over 700 kbps data throughput for top performance
- 128-byte FIFO and on-chip H/W, S/W flow control
- Universal PCI compatible with 3.3/5 V PCI and PCI-X
- Serial communication speed up to 921.6 kbps
- Drivers provided for a broad selection of operating systems, including the latest Windows and Linux
- Easy maintenance with on-board LED display
- Wide temperature model available for -40 to 85°C environments

PComm Lite

Overview

Moxa's CP-114UL/UL-I series of multiport serial boards are designed to be used by industrial automation system integrators for long distance, multipoint, PC-based data acquisition applications. On-chip Automatic Data Direction Control for precision RS-485 communication requires precise timing control to enable and disable the line driver. The Moxa Turbo Serial Engine™ chip that powers the CP-114UL/UL-I boards come with on-chip ADDC®, which makes RS-485 as easy to use as RS-232. In RS-485 mode, the serial port can connect up to 31 daisy-chained RS-485 devices within a range of 1.2 km. For long distance RS-485 communication, 2 kV electrical isolation protections are available to prevent equipment damage.

Drives Provided for Windows, Linux, and Unix

Moxa continues to support a wide variety of operating systems, and the CP-114UL/UL-I boards are no exception. Reliable Windows and Linux/Unix drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connector: DB44 female

Serial Interface

Number of Ports: 4
Serial Standards: RS-232/422/485
Max. No. of Boards per PC: 4
Electrical Isolation: 2 kV (CP-114UL-I only)

Performance

Baudrate: 50 bps to 921.6 kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Physical Characteristics

Dimensions:
CP-114UL: 64.4 x 120 mm (2.53 x 4.72 in)
CP-114UL-I: 64.4 x 130 mm (2.53 x 5.12 in)

Driver Support

Windows: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), DOS, Windows Embedded CE 5.0/6.0, Windows XP Embedded
Linux: Linux 2.4.x, 2.6.x, 3.x
Unix-like Systems: QNX 6, SCO OpenServer, UnixWare 7, Solaris 10, FreeBSD
Note: Please refer to Moxa's website for the latest driver support information.

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
CP-114UL:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
CP-114UL-I:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11

MTBF (mean time between failures)

Time: 114,223 hrs
Standard: Telcordia (Bellcore) SR-332

Power Requirements

Input Current:
CP-114UL: 320 mA @ 5 VDC
CP-114UL-I: 465 mA @ 5 VDC

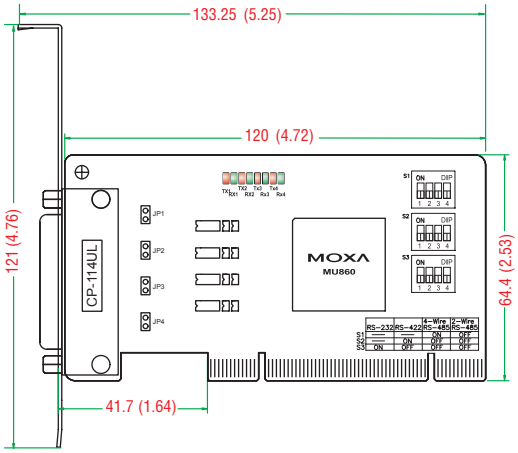
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

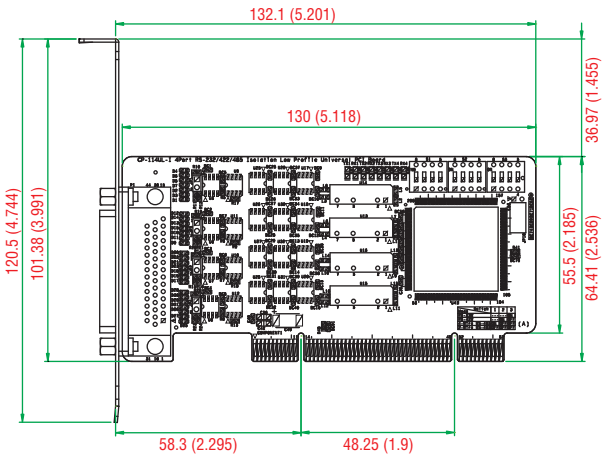
Dimensions

Unit: mm (inch)

CP-114UL



CP-114UL-I



Ordering Information

Available Models

CP-114UL: 4-port RS-232/422/485 low profile Universal PCI board, 0 to 55°C operating temperature
CP-114UL-DB9M: 4-port RS-232/422/485 low profile Universal PCI serial board, 0 to 55°C operating temperature (CBL-M44M9x4-50 cable included)
CP-114UL-DB25M: 4-port RS-232/422/485 low profile Universal PCI serial board, 0 to 55°C operating temperature (CBL-M44M25x4-50 cable included)
CP-114UL-I: 4-port RS-232/422/485 low profile Universal PCI serial board with electrical isolation, 0 to 55°C operating temperature
CP-114UL-I-DB9M: 4-port RS-232/422/485 low profile Universal PCI serial board with electrical isolation, 0 to 55°C operating temperature (CBL-M44M9x4-50 cable included)
CP-114UL-I-DB25M: 4-port RS-232/422/485 low profile Universal PCI serial board with electrical isolation, 0 to 55°C operating temperature (CBL-M44M25x4-50 cable included)
CP-114UL-T: 4-port RS-232/422/485 low profile Universal PCI serial board, -40 to 85°C operating temperature
CP-114UL-I-T: 4-port RS-232/422/485 low profile Universal PCI serial board with electrical isolation, -40 to 85°C operating temperature

Package Checklist

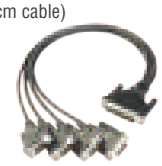
- 1 CP-114UL or CP-114UL-I board
- Low profile bracket
- 1 connection cable (optional)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Connection Options (can be purchased separately)

Low Profile Bracket: Bracket for DB44 connector (1490000001000)
CBL-M44M9x4-50: M44 to 4 x DB9-M cable, 50 cm
CBL-M44M25x4-50: M44 to 4 x DB25-M cable, 50 cm

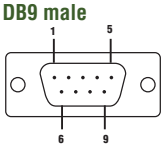
CBL-M44M9x4-50

DB44 male to DB9 male x 4 (50 cm cable)



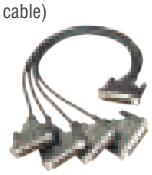
PIN	RS-232	RS-422	RS-485-4w	RS-485-2w
1	DCD	TxD-(A)	TxD-(A)	–
2	RxD	TxD+(B)	TxD+(B)	–
3	TxD	RxD+(B)	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	RxD-(A)	Data-(A)
5	GND	GND	GND	GND
6	DSR	–	–	–
7	RTS	–	–	–
8	CTS	–	–	–
9	–	–	–	–

DB9 male



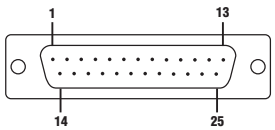
CBL-M44M25x4-50

DB44 male to DB25 male x 4 (50 cm cable)



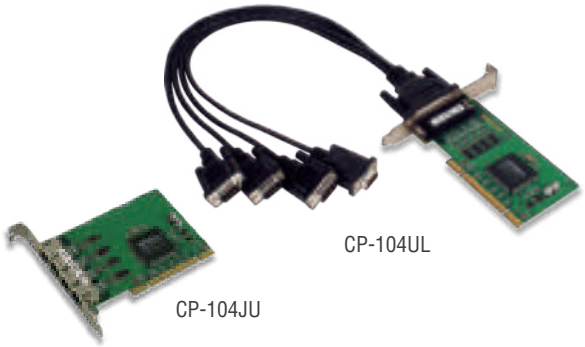
PIN	RS-232	RS-422	RS-485-4w	RS-485-2w
2	TxD	RxD+(B)	RxD+(B)	Data+(B)
3	RxD	TxD+(B)	TxD+(B)	–
4	RTS	–	–	–
5	CTS	–	–	–
6	DSR	–	–	–
7	GND	GND	GND	GND
8	DCD	TxD-(A)	TxD-(A)	–
20	DTR	RxD-(A)	RxD-(A)	Data-(A)
22	–	–	–	–

DB25 male



CP-104UL/JU

4-port RS-232 smart Universal PCI serial boards



- Over 800 kbps data throughput for top performance
- 921.6 kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Compatible with 3.3/5 V PCI and PCI-X
- Drivers provided for a broad selection of operating systems, including the latest Windows and Linux
- Wide temperature model available for -40 to 85°C environments

PComm Lite

Introduction

The CP-104UL and CP-104JU 4-port universal PCI boards are designed for POS and ATM applications. They are a top choice of industrial automation engineers and system integrators, and support many different operating systems, including Windows, Linux, and even Unix. In addition, each of the boards' RS-232 serial ports supports a super fast 921.6 kbps baudrate. The CP-104UL and CP-104JU provide full modem control signals to ensure compatibility with a wide range of serial peripherals, and they work with both 3.3 V and 5 V PCI buses, allowing the boards to be installed in virtually any available PC server.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connector:
CP-104UL: DB44 female
CP-104JU: RJ45 x 4

Serial Interface

Number of Ports: 4
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Performance

Baudrate: 50 bps to 921.6 kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Physical Characteristics

Dimensions:
CP-104UL: 64.4 x 120 mm (2.53 x 4.72 in)
CP-104JU: 83 x 120 mm (3.27 x 4.72 in)

Driver Support

Windows: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), DOS, Windows Embedded CE 5.0/6.0, Windows XP Embedded
Linux: Linux 2.4.x, 2.6.x, 3.x
Unix-like Systems: QNX 6, SCO OpenServer, UnixWare 7, Solaris 10, FreeBSD
Note: Please refer to Moxa's website for the latest driver support information.

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
CP-104UL:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11
CP-104JU:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m

MTBF (mean time between failures)

Time:
CP-104UL: 558,961 hrs
CP-104JU: 571,627 hrs
Standard:
CP-104UL: MIL-HDBK-217F
CP-104JU: Telcordia (Bellcore) TR/SR

Power Requirements

Input Current:
CP-104UL: 120 mA @ 5 VDC
CP-104JU: 135 mA @ 5 VDC

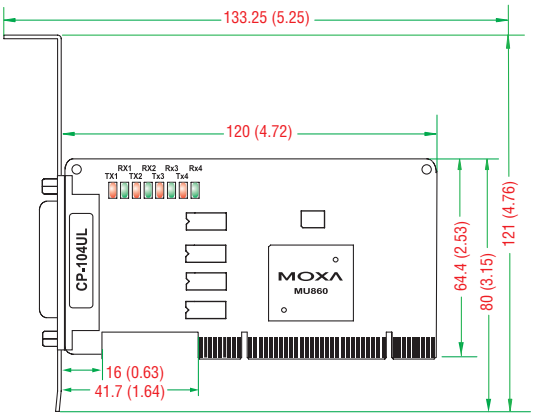
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

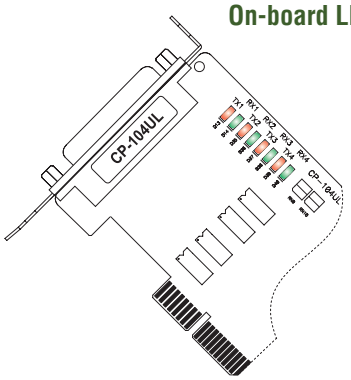
Dimensions

CP-104UL

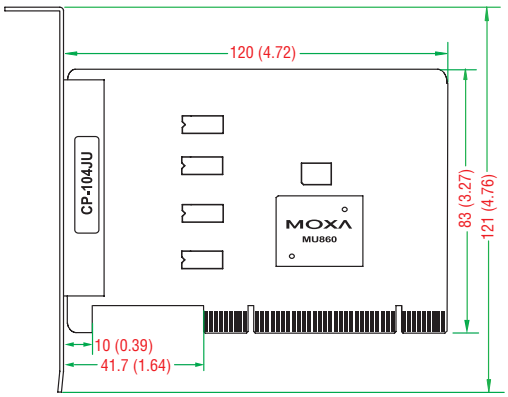
Unit: mm (inch)

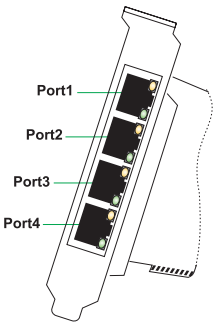


On-board LEDs



CP-104JU





Ordering Information

Available Models

CP-104UL-DB9M: 4-port RS-232 low profile Universal PCI serial board, 0 to 55°C operating temperature (CBL-M44M9x4-50 cable included)
CP-104UL-DB25M: 4-port RS-232 low profile Universal PCI serial board, 0 to 55°C operating temperature (CBL-M44M25x4-50 cable included)
CP-104JU: 4-port RS-232 Universal PCI serial board with RJ45 ports on the board, 0 to 55°C operating temperature
CP-104UL-T: 4-port RS-232 low profile Universal PCI serial board, -40 to 85°C operating temperature
CP-104JU-T: 4-port RS-232 Universal PCI serial board with RJ45 ports on the board, -40 to 85°C operating temperature

Package Checklist

- 1 CP-104UL or CP-104JU board
- Low profile bracket (CP-104UL only)
- 1 connection cable (optional)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Connection Options (can be purchased separately)

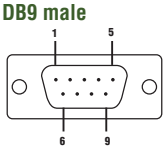
Low Profile Bracket: Bracket for DB44 connector (1490000001000)
CBL-M44M9x4-50: M44 to 4 x DB9-M cable, 50 cm
CBL-M44M25x4-50: M44 to 4 x DB25-M cable, 50 cm

CBL-M44M9x4-50
DB44 male to DB9 male x 4 (50 cm cable)

CBL-RJ45M9-150
8-pin RJ45 to DB9 male (150 cm cable)

PIN	RS-232	PIN	RS-232
1	DCD	5	GND
2	RxD	6	DSR
3	TxD	7	RTS
4	DTR	8	CTS

DB9 male

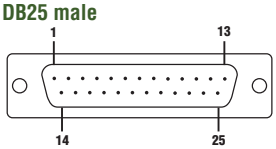


CBL-M44M25x4-50
DB44 male to DB25 male x 4 (50 cm cable)

CBL-RJ45M25-150
8-pin RJ45 to DB25 male (150 cm cable)

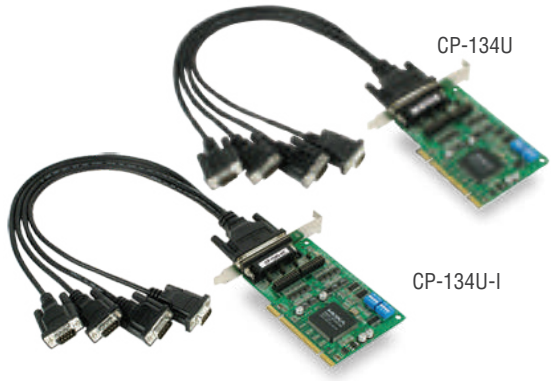
PIN	RS-232	PIN	RS-232
2	TxD	6	DSR
3	RxD	7	GND
4	RTS	8	DCD
5	CTS	20	DTR

DB25 male



CP-134U/U-I

4-port RS-422/485 Universal PCI serial boards with optional 2 kV isolation



- Over 700 kbps data throughput for top performance
- 921.6 kbps maximum baudrate for super fast data transmission
- ADDC® provides automatic data direction control for RS-485 signals
- 128-byte FIFO and on-chip H/W, S/W flow control
- Compatible with 3.3/5 V PCI and PCI-X
- Drivers provided for a broad selection of operating systems, including the latest Windows and Linux
- Added bonus! Ports 1 and 2 support RS-232 and RS-422/485
- Wide temperature model available for -40 to 85°C environments

Overview

The CP-134U and CP-134U-I 4-port universal PCI boards are designed for industrial automation applications that require a long distance, multipoint, PC-based data acquisition solution.

On-chip Automatic Data Direction Control for precise RS-485 communication

RS-485 communication requires precise timing control to enable and disable the line driver. The Moxa Turbo Serial Engine™ chip that powers the CP-134U board comes with on-chip ADDC®, which makes RS-485 as easy to use as RS-232.

RS-485 multidrop for up to 31 devices within 1.2 km

The CP-134U universal PCI board has 4 RS-422/485 serial ports, each of which can achieve data rates up to 921.6 kbps. In RS-485 mode, the board can connect up to 31 daisy-chained RS-485 devices within a range of 1.2 km. For long distance RS-485 communication, choose the CP-134U-I, which comes with 2 kV electrical isolation protection to prevent equipment damage.

Drivers Provided for Windows, Linux, and Unix

Moxa continues to support a wide variety of operating systems, and the CP-134U and CP-134U-I boards are no exception. Reliable Windows and Linux/Unix drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connector: DB44 female

Serial Interface

Number of Ports: 4
Serial Standards: 2 x RS-232/422/485, 2 x RS-422/485
Max. No. of Boards per PC: 4

Serial Line Protection

Electrical Isolation: 2 kV (CP-134U-I configured for RS-422/485 only)

Performance

Baudrate: 50 bps to 921.6 kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), RTS+(B), RTS-(A), CTS+(B), CTS-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Physical Characteristics

Dimensions:
CP-134U: 82.5 x 120 mm (3.24 x 4.72 in)
CP-134U-I: 115 x 120 mm (4.52 x 4.72 in)

Driver Support

Windows: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), DOS, Windows Embedded CE 5.0/6.0, Windows XP Embedded
Linux: Linux 2.4.x, 2.6.x, 3.x
Unix-like Systems: QNX 6, SCO OpenServer, UnixWare 7, Solaris 10, FreeBSD
Note: Please refer to Moxa's website for the latest driver support information.

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m

MTBF (mean time between failures)

Time: 480,209 hrs
Standard: Telcordia (Bellcore) TR/SR

Power Requirements

Input Current:
CP-134U: 180 mA @ 5 VDC
CP-134U-I: 850 mA @ 5 VDC

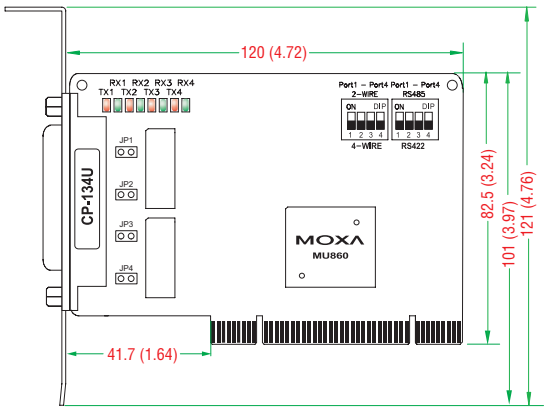
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

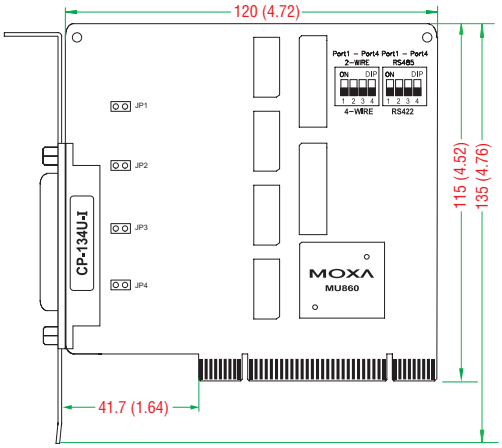
Dimensions

Unit: mm (inch)

CP-134U



CP-134U-I



Ordering Information

Available Models

CP-134U: 4-port RS-422/485 Universal PCI serial board, 0 to 55°C operating temperature
CP-134U-DB9M: 4-port RS-422/485 Universal PCI serial board, 0 to 55°C operating temperature (CBL-M44M9x4-50 cable included)
CP-134U-DB25M: 4-port RS-422/485 Universal PCI serial board, 0 to 55°C operating temperature (CBL-M44M25x4-50 cable included)
CP-134U-I: 4-port RS-422/485 Universal PCI serial board with electrical isolation, 0 to 55°C operating temperature
CP-134U-I-DB9M: 4-port RS-422/485 Universal PCI serial board with electrical isolation, 0 to 55°C operating temperature (CBL-M44M9x4-50 cable included)
CP-134U-I-DB25M: 4-port RS-422/485 Universal PCI serial board with electrical isolation, 0 to 55°C operating temperature (CBL-M44M25x4-50 cable included)
CP-134U-T: 4-port RS-422/485 Universal PCI serial board, -40 to 85°C operating temperature
CP-134U-I-T: 4-port RS-422/485 Universal PCI serial board with electrical isolation, -40 to 85°C operating temperature

Package Checklist

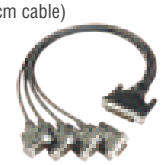
- 1 CP-134U or CP-134U-I board
- 1 connection cable (optional)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Connection Options (can be purchased separately)

Low Profile Bracket: Bracket for DB44 connector (1490000001000)
CBL-M44M9x4-50: M44 to 4 x DB9-M cable, 50 cm
CBL-M44M25x4-50: M44 to 4 x DB25-M cable, 50 cm

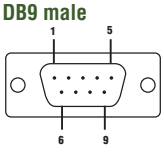
CBL-M44M9x4-50

DB44 male to DB9 male x 4 (50 cm cable)



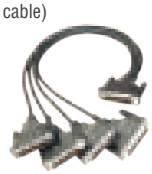
PIN	RS-232	RS-422	RS-485-4w	RS-485-2w
1	DCD	TxD-(A)	TxD-(A)	–
2	RxD	TxD+(B)	TxD+(B)	–
3	TxD	RxD+(B)	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	RxD-(A)	Data-(A)
5	GND	GND	GND	GND
6	DSR	RTS-(A)	–	–
7	RTS	RTS+(B)	–	–
8	CTS	CTS+(B)	–	–
9	–	CTS-(A)	–	–

DB9 male



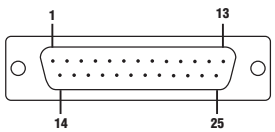
CBL-M44M25x4-50

DB44 male to DB25 male x 4 (50 cm cable)



PIN	RS-232	RS-422	RS-485-4w	RS-485-2w
2	TxD	RxD+(B)	RxD+(B)	Data+(B)
3	RxD	TxD+(B)	TxD+(B)	–
4	RTS	RTS+(B)	–	–
5	CTS	CTS+(B)	–	–
6	DSR	RTS-(A)	–	–
7	GND	GND	GND	GND
8	DCD	TxD-(A)	TxD-(A)	–
20	DTR	RxD-(A)	RxD-(A)	Data-(A)
22	–	CTS-(A)	–	–

DB25 male



CP-112UL/UL-I Series

2-port RS-232/422/485 Universal PCI serial boards with optional 2 kV isolation

CP-112UL

CP-112UL-I

- Over 700 kbps data throughput for top performance
- 128-byte FIFO and on-chip H/W, S/W flow control
- Universal PCI compatible with 3.3/5 V PCI and PCI-X
- Serial communication speed up to 921.6 kbps
- Drivers provided for a broad selection of operating systems, including the latest Windows and Linux
- Easy maintenance with on-board LED display
- Wide temperature model available for -40 to 85°C environments

PComm Lite

Overview

Moxa's CP-112UL/UL-I series of multiport serial boards are designed to be used by industrial automation system integrators for long distance, multipoint, PC-based data acquisition applications. On-chip Automatic Data Direction Control for precision RS-485 communication requires precise timing control for enabling and disabling the line driver. Moxa's Turbo Serial Engine™ chip that powers the CP-112UL/UL-I boards comes with on-chip ADDC®, which makes RS-485 as easy to use as RS-232. The boards come with 2 RS-422/485 serial ports, both of which can achieve data rates up to 921.6 kbps. In RS-485 mode, the serial port can connect up to 31 daisy-chained RS-485 devices within a range of 1.2 km. For long distance RS-485 communication, 2 kV electrical isolation protection is available to prevent equipment damage.

Drivers Provided for Windows, Linux, and Unix

Moxa continues to support a wide variety of operating systems, and the CP-112UL/UL-I boards are no exception. Reliable Windows and Linux/Unix drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connector: DB25 female

Serial Interface

Number of Ports: 2
Serial Standards: RS-232/422/485
Max. No. of Boards per PC: 4
Electrical Isolation: 2 kV (CP-112UL-I only)

Performance

Baudrate: 50 bps to 921.6 kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Physical Characteristics

Dimensions: 64.4 x 120 mm (2.53 x 4.72 in)

Driver Support

Windows: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), DOS, Windows Embedded CE 5.0/6.0, Windows XP Embedded
Linux: Linux 2.4.x, 2.6.x, 3.x
Unix-like Systems: QNX 6, SCO OpenServer, UnixWare 7, Solaris 10, FreeBSD
Note: Please refer to Moxa's website for the latest driver support information.

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11

MTBF (mean time between failures)

Time: 219,971 hrs
Standard: Telcordia (Bellcore) TR/SR

Power Requirements

Input Current:
CP-112UL: 175 mA @ 5 VDC
CP-112UL-I: 290 mA @ 5 VDC

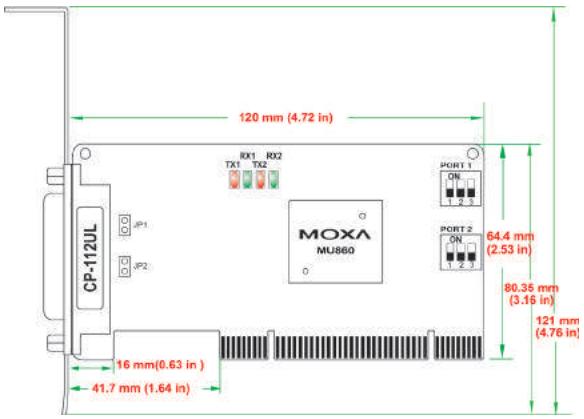
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

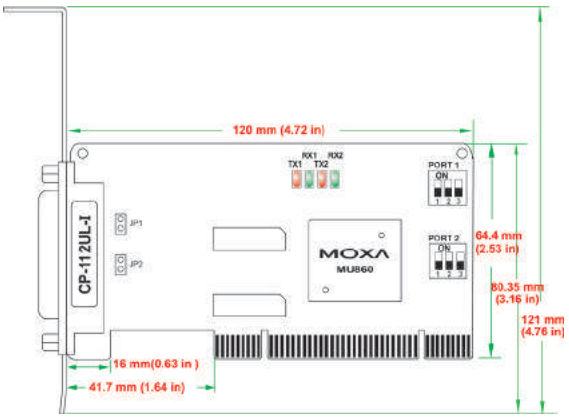
Dimensions

Unit: mm (inch)

CP-112UL



CP-112UL-I



Ordering Information

Available Models

CP-112UL-DB9M: 2-port RS-232/422/485 low profile Universal PCI board, 0 to 55°C operating temperature (CBL-M25M9x2-50 cable included)
CP-112UL-I-DB9M: 2-port RS-232/422/485 low profile Universal PCI board with electrical isolation, 0 to 55°C operating temperature (CBL-M25M9x2-50 cable included)
CP-112UL-T: 2-port RS-232/422/485 low profile Universal PCI board, -40 to 85°C operating temperature
CP-112UL-I-T: 2-port RS-232/422/485 low profile Universal PCI board with electrical isolation, -40 to 85°C operating temperature

Package Checklist

- 1 CP-112UL or CP-112UL-I board
- Low profile bracket
- 1 connection cable (optional)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Connection Options (can be purchased separately)

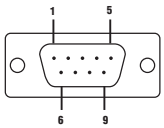
Low Profile Bracket: Bracket for DB44 connector (1490000001000)
CBL-M25M9x2-50: M25 to 2 x DB9-M cable, 50 cm

CBL-M25M9x2-50

DB25 male to DB9 male x 2 (50 cm cable)

PIN	RS-232	RS-422	RS-485-4W	RS-485-2W
1	DCD	TxD-(A)	TxD-(A)	–
2	RxD	TxD+(B)	TxD+(B)	–
3	TxD	RxD+(B)	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	RxD-(A)	Data+(A)
5	GND	GND	GND	GND
6	DSR	–	–	–
7	RTS	–	–	–
8	CTS	–	–	–
9	–	–	–	–

DB9 male



CP-102U/UL

2-port RS-232 Universal PCI serial boards

- Excellent data throughput at over 800 kbps
- 921.6 kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Compatible with 3.3/5 V PCI and PCI-X
- Drivers provided for a broad selection of operating systems, including the latest Windows and Linux
- MD1 low profile form factor (CP-102UL) fits compact PCs
- Wide temperature model available for -40 to 85°C environments

Overview

The CP-102U and CP-102UL are 2-port universal PCI boards designed for POS and ATM applications. They are designed especially for industrial automation engineers and system integrators to support many different operating systems, including Windows, Linux, and even Unix. In addition, each RS-232 serial port supports up to 921.6 kbps baudrate. The CP-102U and CP-102UL implements full modem control signals to ensure compatibility with a wide range of serial peripherals, and they work with both 3.3 V and 5 V PCI buses, allowing the boards to be installed in virtually any PC.

Designed for Standard and Compact PCs

The CP-102UL is a low-profile board requiring a 5 VDC power supply. It is compatible with both a 3.3 V and 5 V PCI bus, allowing the CP-102UL to be tucked inside compact PCs.

Top Serial Performance

With 20-plus years of experience in serial board design, Moxa is now concentrating on a new high-performance serial data transmission chip. The Turbo Serial Engine™ chip provides serial boards with a 128-byte FIFO, on-chip hardware and software flow control, and burst data mode. With Turbo Serial Engine™, Moxa is able to offer advanced smart serial boards with unbeatable transmission performance.

Drivers Provided for Windows, Linux, and Unix

Moxa continues to support a wide variety of operating systems, and the CP-102U/UL boards are no exception. Reliable Windows and Linux/Unix drivers are provided for all Moxa boards, with support for many operating systems, including WEPOS, for embedded integration.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connector:
CP-102U: DB9 male x 2
CP-102UL: DB25 female

Serial Interface

Number of Ports: 2 (only one IRQ required)
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Performance

Baudrate: 50 bps to 921.6 kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Physical Characteristics

Dimensions:
CP-102U: 80 x 120 mm (3.15 x 4.72 in)
CP-102UL: 64.5 x 120 mm (2.53 x 4.72 in)

Driver Support

Windows: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), DOS, Windows Embedded CE 5.0/6.0, Windows XP Embedded
Linux: Linux 2.4.x, 2.6.x, 3.x
Unix-like Systems: QNX 6, SCO OpenServer, UnixWare 7, Solaris 10, FreeBSD
Note: Please refer to Moxa's website for the latest driver support information.

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
CP-102U:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
CP-102UL:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11

MTBF (mean time between failures)

Time:
CP-102U: 574,050 hrs
CP-102UL: 576,401 hrs
Standard:
CP-102U: MIL-HDBK-217F
CP-102UL: Telcordia (Bellcore) TR/SR

Power Requirements

Input Current: 93 mA @ 5 VDC

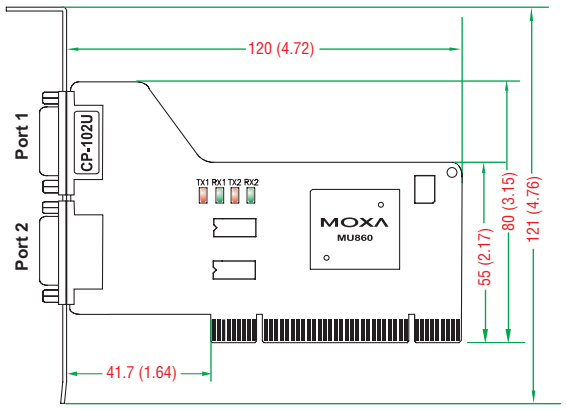
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

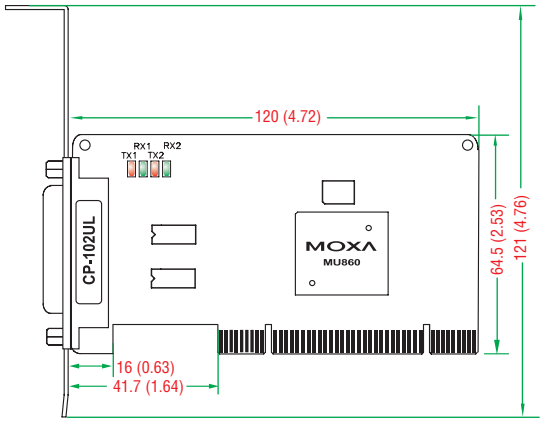
Dimensions

Unit: mm (inch)

CP-102U



CP-102UL



Ordering Information

Available Models

CP-102U: 2-port RS-232 Universal PCI serial board, 0 to 55°C operating temperature
CP-102UL-DB9M: 2-port RS-232 low profile Universal PCI serial board, 0 to 55°C operating temperature (CBL-M25M9x2-50 cable included)
CP-102U-T: 2-port RS-232 Universal PCI serial board, -40 to 85°C operating temperature
CP-102UL-T: 2-port RS-232 low profile Universal PCI serial board, -40 to 85°C operating temperature

Connection Options (can be purchased separately)

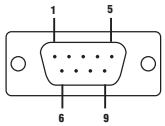
Low Profile Bracket: Bracket for DB44 connector (1490000001000)
CBL-M25M9x2-50: M25 to 2 x DB9-M cable, 50 cm

CBL-M25M9x2-50

DB25 male to DB9 male x 2 (50 cm cable)

PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

DB9 male

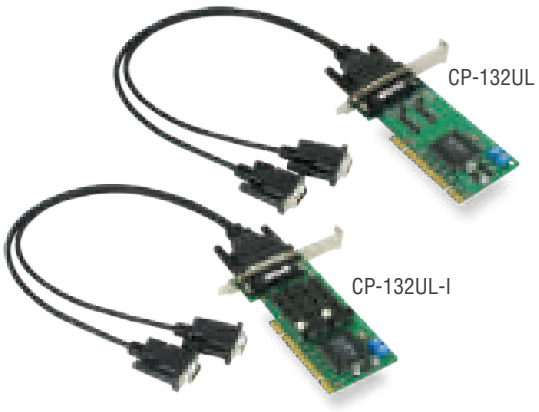


Package Checklist

- 1 CP-102U or CP-102UL board
- Low profile bracket (CP-102UL only)
- 1 connection cable (optional)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

CP-132UL/UL-I

2-port RS-422/485 Universal PCI serial boards with optional 2 kV isolation



- Over 800 kbps data throughput for top performance
- 921.6 kbps maximum baudrate for super fast data transmission
- ADDC® provides automatic data direction control for RS-485 signals
- Transmit data up to 1.2 km with RS-422/485
- 128-byte FIFO and on-chip S/W flow control
- Compatible with 3.3/5 V PCI and PCI-X
- Drivers provided for a broad selection of operating systems, including the latest Windows and Linux
- MD1 low profile form factor fits small-sized PCs
- Wide temperature model available for -40 to 85°C environments

Overview

The CP-132UL and CP-132UL-I are 2-port Universal PCI boards designed for industrial automation applications that require a long distance, multipoint, PC-based data acquisition solution.

On-chip Automatic Data Direction Control for precise RS-485 communication

RS-485 communication requires precise timing control to enable and disable the line driver. Moxa's Turbo Serial Engine™ chip that powers the CP-132UL/UL-I boards comes with on-chip ADDC®, which makes RS-485 as easy to use as RS-232.

RS-485 multidrop for up to 31 devices within 1.2 km

The CP-132UL/UL-I Universal PCI boards have two RS-422/485 serial ports, both of which can achieve data rates up to 921.6 kbps. In RS-485 mode, the boards can connect up to 31 daisy-chained RS-485 devices within a range of 1.2 km. For long distance RS-485 communication, choose the CP-132UL-I model, which comes with 2 kV electrical isolation protection to prevent equipment damage.

Top Serial Performance

With 20-plus years of experience in serial board design, Moxa is now concentrating on a new high performance serial data transmission chip. The Turbo Serial Engine™ chip provides serial boards with a 128-byte FIFO, on-chip software flow control, and burst data mode. Thanks to the Turbo Serial Engine™, Moxa is able to offer the world's best performing smart serial boards.

Drivers Provided for Windows, Linux, and Unix

Moxa continues to support a wide variety of operating systems, and the CP-132UL/UL-I boards are no exception. Reliable Windows and Linux/Unix drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connector: DB25 female

Serial Interface

Number of Ports: 2
Serial Standards: RS-422/485
Max. No. of Boards per PC: 4

Serial Line Protection

Electrical Isolation: 2 kV (CP-132UL-I only)

Performance

Baudrate: 50 bps to 921.6 kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: XON/XOFF

Serial Signals

RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), RTS+(B), RTS-(A), CTS+(B), CTS-(A), GND

RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Physical Characteristics

Dimensions:
CP-132UL: 64.4 x 120 mm (2.53 x 4.72 in)
CP-132UL-I: 64.4 x 120 mm (2.53 x 4.72 in)

Driver Support

Windows: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), DOS, Windows Embedded CE 5.0/6.0, Windows XP Embedded
Linux: Linux 2.4.x, 2.6.x, 3.x
Unix-like Systems: QNX 6, SCO OpenServer, UnixWare 7, Solaris 10, FreeBSD
Note: Please refer to Moxa's website for the latest driver support information.

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m

MTBF (mean time between failures)

Time: 1,647,832 hrs
Standard: Telcordia (Bellcore) TR/SR

Power Requirements

Input Current:
CP-132UL: 120 mA @ 5 VDC
CP-132UL-I: 490 mA @ 5 VDC

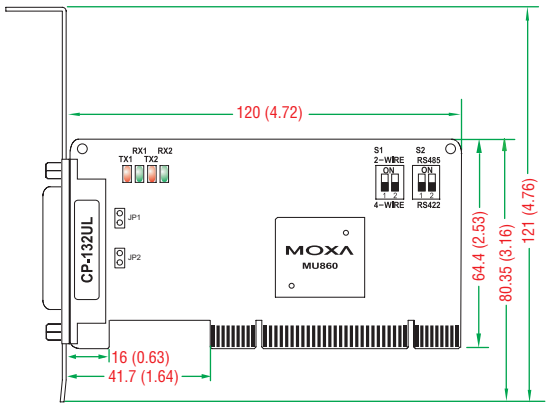
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

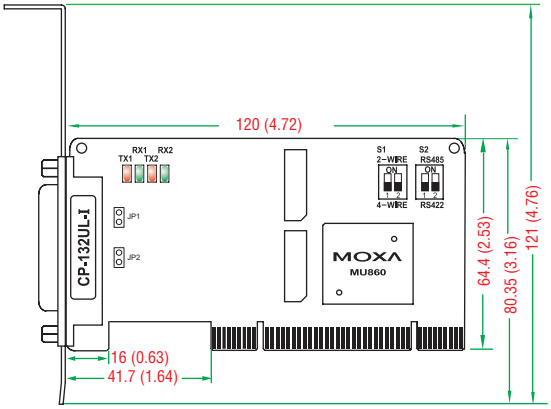
Dimensions

Unit: mm (inch)

CP-132UL



CP-132UL-I



Ordering Information

Available Models

CP-132UL-DB9M: 2-port RS-422/485 low profile Universal PCI serial board, 0 to 55°C operating temperature (CBL-M25M9x2-50 cable included)
CP-132UL-I-DB9M: 2-port RS-422/485 low profile Universal PCI serial board with electrical isolation, 0 to 55°C operating temperature (CBL-M25M9x2-50 cable included)
CP-132UL-T: 2-port RS-422/485 low profile Universal PCI serial board, -40°C to 85 operating temperature
CP-132UL-I-T: 2-port RS-422/485 low profile Universal PCI serial board with electrical isolation, -40°C to 85 operating temperature

Package Checklist

- 1 CP-132UL or CP-132UL-I board
- Low profile bracket
- 1 connection cable (optional)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Connection Options (can be purchased separately)

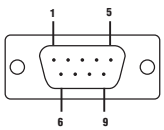
Low Profile Bracket: Bracket for DB44 connector (3095010000007)
CBL-M25M9x2-50: M25 to 2 x DB9-M cable, 50 cm

CBL-M25M9x2-50

DB25 male to DB9 male x 2 (50 cm cable)

PIN	RS-422	RS-485-4w	RS-485-2w
1	TxD-(A)	TxD-(A)	–
2	TxD+(B)	TxD+(B)	–
3	RxD+(B)	RxD+(B)	Data+(B)
4	RxD-(A)	RxD-(A)	Data-(A)
5	GND	GND	GND
6	RTS-(A)	–	–
7	RTS+(B)	–	–
8	CTS+(B)	–	–
9	CTS-(A)	–	–

DB9 male



POS-104UL

4-port RS-232 Universal PCI boards with power over serial

- Over 800 kbps data throughput, for top performance
- Power options for each port: 5 V (output), 12 V (output), and RI (input)
- Serial port power from bus or power supply
- 921.6 kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Compatible with 3.3/5 V PCI and PCI-X
- Low profile board, suitable for compact-sized PCs
- Drivers provided for a broad selection of operating systems, including the latest Windows and Linux
- Wide temperature model available for -40 to 85°C environments

Introduction

The POS-104UL is a smart, 4-port Universal PCI serial board designed for POS and ATM applications and for use by industrial automation system manufacturers and system integrators. The POS-104UL is compatible with all major operating systems. In addition, each of the 4 RS-232 serial ports supports data rates up to 921.6 kbps and provides full modem control signals to ensure compatibility with a wide range of serial peripherals. The POS-104UL supplies 5 or 12 volts of power to each serial port, and it works with both 3.3 V and 5 V PCI buses, making it suitable for installation in most PC servers.

Specifications

Hardware
Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connector: DB44 female

Serial Interface
Number of Ports: 4
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Performance
Baudrate: 50 bps to 921.6 kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND, RI (optional)

Physical Characteristics
Dimensions: 64.4 x 120 mm (2.53 x 4.72 in)

Driver Support
Windows: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), DOS, Windows Embedded CE 5.0/6.0, Windows XP Embedded
Linux: Linux 2.4.x, 2.6.x, 3.x
Unix-like Systems: QNX 6, SCO OpenServer, UnixWare 7, Solaris 10, FreeBSD
Note: Please refer to Moxa's website for the latest driver support information.

Environmental Limits
Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m; Signal: 10 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11

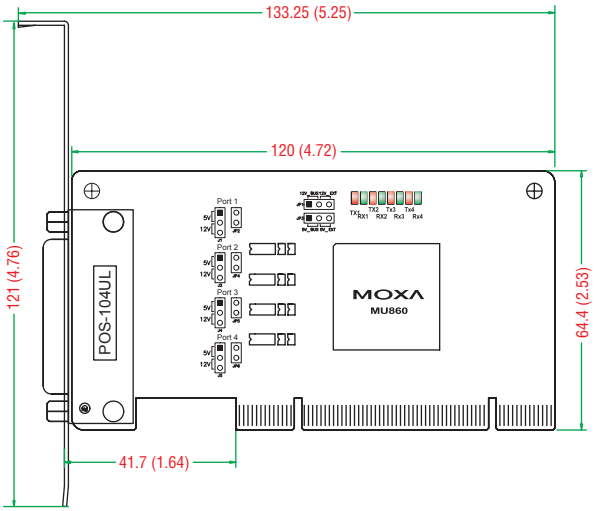
MTBF (mean time between failures)
Time: 2,124,022 hrs
Standard: Telcordia (Bellcore) TR/SR

Power Requirements
Input Current: 145 mA @ 5 VDC

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

POS-104UL-DB9M: 4-port RS-232 low profile Universal PCI board with serial port power, 0 to 55°C operating temperature (CBL-M44M9x4-50 (POS) cable included)
POS-104UL-T: 4-port RS-232 low profile Universal PCI board with serial port power, -40 to 85°C operating temperature

Connection Options (can be purchased separately)

CBL-M44M9x4-50 (POS): M44 to 4 x DB9-M cable, 50 cm
Low Profile Bracket: Bracket for DB44 connector (1490000001000)

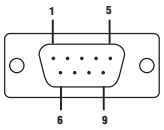
Package Checklist

- 1 POS-104UL board
- Low profile bracket
- 1 connection cable (optional)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

CBL-M44M9x4-50 (POS)

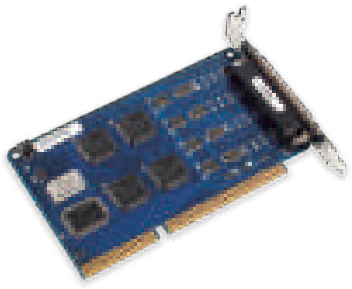
PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	5V/12V/RI

DB9 male



C168H/HS

8-port RS-232 ISA serial boards



- Compact ISA boards with 8 RS-232 ports
- 921.6 kbps maximum baudrate for super fast data transmission
- 16-byte FIFO and on-chip H/W flow control
- Choose from a wide range of connection cables and boxes
- Drivers provided for Windows, Windows XP Embedded, DOS, Linux 2.4, 2.6, 3, QNX 4/6, FreeBSD, SCO OpenServer UnixWare 7, Solaris 10
- Easy configuration, without switches or jumpers

PComm Lite

Overview

The 8-port C168H/HS ISA boards offer users a basic, high-performance multiport serial communication solution for connecting terminals, modems, printers, data acquisition equipment, and other serial devices to a PC. The boards are a top choice of industrial automation engineers and system integrators, and they support many different operating systems, including Windows, Linux, and even Unix. In addition, each of the 8 RS-232 ports supports a superfast 921.6 kbps baudrate.

Specifications

Hardware
Comm. Controller: 16C550C or compatible x 8
Bus: 16-bit ISA
Connector: DB62 female

Serial Interface
Number of Ports: 8
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Serial Line Protection
Electrical Isolation: 500 V with connector Opt8F (must be purchased separately)

Performance
Baudrate: 50 bps to 921.6 kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
I/O Address: 0x0000-0xFFFF (default = 0x180)
IRQ: 2 (9), 3, 4, 5, 7, 10 (default), 11, 12, 15

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Physical Characteristics
Dimensions: 93 x 157 mm (3.66 x 6.18 in)

Driver Support
Windows: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), DOS, Windows Embedded CE 5.0/6.0, Windows XP Embedded
Linux: Linux 2.4.x, 2.6.x, 3.x
Unix-like Systems: QNX 6, SCO OpenServer, UnixWare 7, Solaris 10, FreeBSD
Note: Please refer to Moxa's website for the latest driver support information.

Environmental Limits
Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 85°C (-4 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11

MTBF (mean time between failures)
Time: 601,501 hrs
Standard: MIL-HDBK-217F

Power Requirements
Input Current: 170 mA @ +5 VDC; 100 mA @ +12 VDC; 160 mA @ -12 VDC

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models
C168H: 8-port RS-232 ISA serial board
C168HS: 8-port RS-232 ISA serial board with surge protection

Connection Options (can be purchased separately)
CBL-M62M9x8-100: M62 to 8 x DB9-M cable, 100 cm
CBL-M62M25x8-100: M62 to 8 x DB25-M cable, 100 cm

Optional Connectors (choose one per board)
OPT8A: M62 to 8 x DB25-F connection box w/ 150 cm DB62-M to DB62-F cable
OPT8B: M62 to 8 x DB25-M connection box w/ 150 cm DB62-M to DB62-F cable
OPT8S: M62 to 8 x DB25-F connection box w/ surge protection, and 150 cm DB62-M to DB62-F cable
OPT8-M9: M62 to 8 x DB9-M connection box w/ 150 cm DB62-M to DB62-F cable
OPT8-RJ45: M62 to 8 x RJ45 (8-pin) connection box w/ 30 cm cable

Package Checklist
- 1 C168H or C168HS board
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

C104H/HS

4-port RS-232 ISA serial boards

- Cost-effective, compact ISA boards with 4 RS-232 ports
- 921.6 kbps maximum baudrate for super fast data transmission
- 16-byte FIFO and on-chip H/W, S/W flow control
- Drivers provided for Windows, Windows XP Embedded, DOS, Linux 2.4, 2.6, 3, QNX 4/6, FreeBSD, SCO OpenServer, UnixWare 7, Solaris 10
- Easy configuration, without switches or jumpers

PComm Lite

Overview

The 4-port C104H/HS ISA boards offer users an economical, high-performance multiport serial communication solution for connecting terminals, modems, printers, data acquisition equipment, and other serial devices to a PC. The boards are a top choice of industrial automation engineers and system integrators, and they support many different operating systems, including Windows, Linux, and even Unix. In addition, each of the 4 RS-232 ports supports a superfast 921.6 kbps baudrate.

Specifications

Hardware

Comm. Controller: 16C550C or compatible x 4
Bus: 16-bit ISA
Connector: DB37 female

Serial Interface

Number of Ports: 4
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Performance

Baudrate: 50 bps to 921.6 kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
I/O Address: 0x0000-0xFFFF (default = 0x180)
IRQ: 2 (9), 3, 4, 5, 7, 10 (default), 11, 12, 15

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Physical Characteristics

Dimensions: 83 x 157 mm (3.27 x 6.18 in)

Driver Support

Windows: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows 3.x, DOS, Windows Embedded CE 5.0/6.0, Windows XP Embedded
Linux: Linux 2.4.x, 2.6.x, 3.x
Unix-like Systems: QNX 6, SCO OpenServer, UnixWare 7, Solaris 10, FreeBSD
Note: Please refer to Moxa's website for the latest driver support information.

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 85°C (-4 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11

MTBF (mean time between failures)

Time: 629,545 hrs
Standard: MIL-HDBK-217F

Power Requirements

Input Current: 100 mA @ +5 VDC; 100 mA @ +12 VDC; 60 mA @ -12 VDC

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models

C104H: 4-port RS-232 ISA serial board
C104H-DB9M: 4-port RS-232 ISA serial board (CBL-M37M9x4-30 cable included)
C104H-DB25M: 4-port RS-232 ISA serial board (CBL-M37M25x4-30 cable included)
C104HS: 4-port RS-232 ISA serial board with surge protection
C104HS-DB9M: 4-port RS-232 ISA serial board with surge protection (CBL-M37M9x4-30 cable included)
C104HS-DB25M: 4-port RS-232 ISA serial board with surge protection (CBL-M37M25x4-30 cable included)

Connection Options (one cable is included with each board)

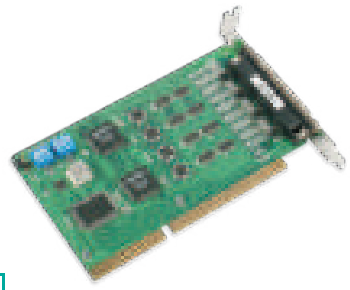
CBL-M37M9x4-30: M37 to 4 x DB9-M cable, 30 cm
CBL-M37M25x4-30: M37 to 4 x DB25-M cable, 30 cm

Package Checklist

- 1 C104H or C104HS board
- 1 connection cable (optional)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

CI-134 Series

4-port RS-422/485 ISA serial boards



PComm Lite

- Cost-effective ISA boards with 4 RS-422/485 ports
- RS-485 data direction control with ADDC® or by RTS
- 921.6 kbps maximum baudrate for super fast data transmission
- 16-byte FIFO and on-chip hardware flow control
- Surge protection and electrical isolation available
- Built-in termination resistors

RoHS CE FC

Overview

The CI-134 series ISA boards come with 4 independent RS-422/485 serial ports for connecting data acquisition equipment and other serial devices to a PC. Connect your devices over longer distances—up to 1.2 km (4000 ft)—and ensure greater reliability in industrial environments with on-board surge protection and electrical isolation (available with some models). Enjoy greater versatility by using point-to-point full duplex connections, or set up a half duplex RS-485 multi-drop network.

Specifications

Hardware

Comm. Controller: 16C550C or compatible x 4
Bus: 16-bit ISA
Connector: DB37 female

Serial Interface

Number of Ports: 4
Serial Standards: RS-422/485
Max. No. of Boards per PC: 4

Serial Line Protection

Electrical Isolation: 2 kV (CI-134I/IS only)

Performance

Baudrate: 50 bps to 921.6 kbps
Built-in Termination Resistor: 120 ohm (enabled by jumper for RS-485-2w)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
I/O Address: 0x0000-0xFFFF (default = 0x180)
IRQ: 2 (9), 3, 4, 5, 7, 10 (default), 11, 12, 15

Serial Signals

RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), RTS+(B), RTS-(A), CTS+(B), CTS-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Physical Characteristics

Dimensions:
CI-134: 85 x 160 mm (3.35 x 6.30 in)
CI-134I/IS: 110 x 180 mm (4.33 x 7.09 in)

Driver Support

Windows: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), Windows 3.x, DOS, Windows Embedded CE 5.0/6.0, Windows XP Embedded
Linux: Linux 2.4.x, 2.6.x, 3.x
Unix-like Systems: QNX 6, SCO OpenServer, UnixWare 7, Solaris 10, FreeBSD
Note: Please refer to Moxa's website for the latest driver support information.

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 85°C (-4 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Signal: 2 kV

MTBF (mean time between failures)

Time: 424,655 hrs
Standard: Telcordia (Bellcore) TR/SR

Power Requirements

Input Current:
CI-134: 450 mA @ 5 VDC
CI-134I: 610 mA @ 5 VDC
CI-134IS: 620 mA @ 5 VDC

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models

CI-134-DB9M: 4-port RS-422/485 ISA serial board (CBL-M37M9x4-30 cable included)
CI-134I-DB9M: 4-port RS-422/485 ISA serial board with electrical isolation (CBL-M37M9x4-30 cable included)
CI-134IS-DB9M: 4-port RS-422/485 ISA serial board with electrical isolation and surge protection (CBL-M37M9x4-30 cable included)
CI-134 w/o Cable: 4-port RS-422/485 ISA serial board (CBL-M37M25x4-30 cable included)
CI-134I w/o Cable: 4-port RS-422/485 ISA serial board with electrical isolation (CBL-M37M25x4-30 cable included)
CI-134IS w/o Cable: 4-port RS-422/485 ISA serial board with electrical isolation and surge protection (CBL-M37M25x4-30 cable included)

Connection Options (one cable is included with each board)

CBL-M37M9x4-30: M37 to 4 x DB9-M cable, 30 cm
CBL-M37M25x4-30: M37 to 4 x DB25-M cable, 30 cm

Package Checklist

- 1 CI-134 board
- 1 connection cable
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

CI-132 Series

2-port RS-422/485 ISA serial boards

- Economical RS-422/485 ISA boards with two DB9 male connectors on the board for easy wiring
- RS-485 data direction control with ADDC® or by RTS
- 921.6 kbps maximum baudrate for super fast data transmission
- 16-byte FIFO and on-chip hardware flow control
- Surge protection and electrical isolation available
- Built-in termination resistors

PComm Lite

Overview

The CI-132 series ISA boards come with 2 independent RS-422/485 serial ports for connecting data acquisition equipment and other serial devices to a PC. Connect your devices over longer distances—up to 1.2 km (4000 ft)—and ensure greater reliability in industrial environments with on-board surge protection and electrical isolation (available with some models). Enjoy greater versatility by using point-to-point full-duplex connections, or set up a half-duplex RS-485 multidrop network.

Specifications

Hardware

Comm. Controller: 16C550C or compatible x 2
Bus: 16-bit ISA
Connectors: DB9 male x 2

Serial Interface

Number of Ports: 2
Serial Standards: RS-422/485
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 25 kV on the board (CI-132IS only)
Electrical Isolation: 2 kV (CI-132I/IS only)

Performance

Baudrate: 50 bps to 921.6 kbps
Built-in Termination Resistor: 120 ohm (enabled by jumper for RS-485-2w)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
I/O Address: 0x0000-0xFFFF (default = 0x180)
IRQ: 2 (9), 3, 4, 5, 7, 10 (default), 11, 12, 15

Serial Signals

RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), RTS+(B), RTS-(A), CTS+(B), CTS-(A), GND
RS-485-2w: Data+(B), Data-(A), GND
RS-485 Data Control: ADDC® (automatic data direction control), or by RTS

Physical Characteristics

Dimensions:
CI-132: 75 x 157 mm (2.95 x 6.18 in)
CI-132I/IS: 105 x 157 mm (4.13 x 6.18 in)

Driver Support

Windows: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1 (x86/x64), Windows 2008 R2/2012/2012 R2 (x64), DOS, Windows Embedded CE 5.0/6.0, Windows XP Embedded
Linux: Linux 2.4.x, 2.6.x, 3.x
Unix-like Systems: QNX 6, SCO OpenServer, UnixWare 7, Solaris 10, FreeBSD
Note: Please refer to Moxa's website for the latest driver support information.

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 85°C (-4 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Signal: 2 kV

MTBF (mean time between failures)

Time: 441,015 hrs
Standard: Telcordia (Bellcore) TR/SR

Power Requirements

Input Current:
CI-132: 240 mA @ 5 VDC
CI-132I/IS: 620 mA @ 5 VDC

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models

CI-132: 2-port RS-422/485 ISA serial board
CI-132I: 2-port RS-422/485 ISA serial board with electrical isolation
CI-132IS: 2-port RS-422/485 ISA serial board with electrical isolation and surge protection

Connection Options (can be purchased separately)

CBL-F9M9-150: DB9-F to DB9-M serial cable, 150 cm
CBL-F9M9-20: DB9-F to DB9-M serial cable, 20 cm

Package Checklist

- 1 CI-132 board
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Introduction to CAN

The CAN serial bus, which was developed for the automotive industry, was introduced in 1986 as the "Automotive Serial Controller Area Network." It was soon discovered that CAN worked extremely well in other embedded systems applications, and consequently its popularity increased. The list of applications that use CAN includes weaving machines, elevator systems in large buildings, all kinds of ships, trains, aircraft, x-ray machines and other medical equipment, logging equipment, tractors and combines, coffee makers, and major appliances.

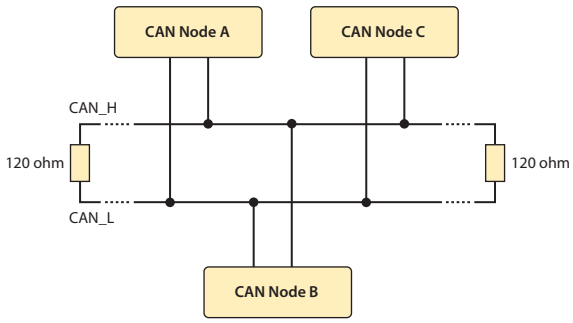
The Controller Area Network (CAN) is a serial protocol that allows multiple processors in a system to communicate with each other in an efficient manner. CAN is now the standard for high-speed, mission-critical, real-time control networks for different types of machines, due to the fact that the networks are reliable, relatively simple, and inexpensive.

CAN systems are quite versatile, and mechanics and technicians find it easy to repair or replace computer hardware in a CAN system, without affecting the rest of the network in any way. In addition, design engineers can easily modify existing CAN systems for other uses by adding or removing network nodes.

The CAN Physical Layer

The CAN serial protocol covers applications that range from high-speed networks to low-cost multiplex wiring. Automotive electronics, engine control units, sensors, and anti-skid-systems, for example, are connected using CAN with bitrates up to 1 Mbps.

CAN signals are typically transmitted differentially through a pair of wires, since doing so greatly improves the reliability of signal transmissions even when the network is subject to low signal levels or common mode errors. The two wires are called CAN_H and CAN_L and use 120-ohm termination resistors. Many CAN systems also use twisted pair wires to reduce the effects of electromagnetic interference. CAN systems are popular since they use an inexpensive bus topology, make it easy to connect additional nodes, and are less prone to network failures.



Layered Structure of a CAN Node

The specifications are designed to achieve compatibility between any two CAN implementations, where compatibility can refer to either electrical features or how transmitted data is interpreted. CAN is subdivided into different layers, as indicated in the accompanying table.

Application Layer
Object Layer
-Message Filtering
-Message and Status Handling
Transfer Layer
-Fault Confinement
-Error Detection and Signaling
-Message Validation
-Acknowledgement
-Arbitration
-Message Framing
-Transfer Rate and Timing
Physical Layer
-Signal Level and Bit Representation
-Transmission Medium

The object layer and the transfer layer comprise all services and functions of the data link layer defined by the ISO/OSI model

The physical layer specifies the physical properties for transferring bits between different nodes and must be the same for all nodes belonging to the same network. The physical layer defines how signals are actually transmitted, but it is not defined to allow transmission medium and signal level implementations to be optimized for their applications.

CP-602E-I Series

2-port CAN interface PCI Express boards with 2 kV isolation

- CAN 2.0A and CAN 2.0B supported
- Two independent CAN communication ports
- CAN transfer rate up to 1 Mbps
- 2 kV electrical isolation
- LED for transmit/receive status on each port
- Optional 120 ohm terminal resistor for CAN bus network
- DLL library and examples included
- Windows driver provided

Overview

Moxa's new CP-602E-I CAN (Controller Area Network) interface board supports the PCI Express interface. As a stand-alone CAN controller, the CP-602E-I is a cost-effective solution that provides two active CAN controllers with a DB9 connector on the same board. The CP-602E-I CAN interface board uses the NXP SJA1000 and transceiver PCA82C251, which provide the bus arbitration and error detection. The -40 to 85°C wide operating temperature (CP-602E-I-T only) and 2 kV isolation make the boards suitable for use in harsh industrial environments.

Specifications

Hardware

Connectors: DB9 male x 2
CAN Controller: NXP SJA1000
CAN Transceiver: PCA82C251
CAN Specification: CAN 2.0 A/B
Signal Support: CAN_H, CAN_L, GND
Transfer Rate: 1 Mbps
Max. Number of Boards per PC: 4
Electrical Isolation: 2 kV
Termination Resistor: 120 ohm (selected by jumper)

Driver Support

Windows: Windows 2000, Windows XP/2003/Vista/2008 (x86/x64)

Software

Libraries: Visual C/C++, Borland C/C++

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11

MTBF (mean time between failures)

Time: 4,645,502 hrs
Standard: Telcordia (Bellcore) SR-332

Power Requirements

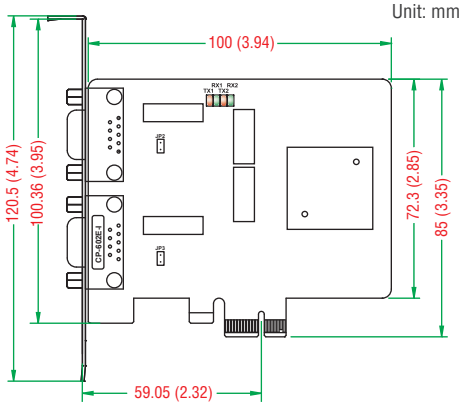
Input Current: 780 mA @ 5 VDC

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

CP-602E-I: 2-port CAN interface PCI Express board, with 2 kV electrical isolation, 0 to 55°C operating temperature
CP-602E-I-T: 2-port CAN interface PCI Express board with 2 kV electrical isolation, -40 to 85°C operating temperature

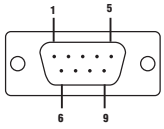
Connection Options (can be purchased separately)

CBL-F9M9-150: DB9-F to DB9-M serial cable, 150 cm
CBL-F9M9-20: DB9-F to DB9-M serial cable, 20 cm

Pin Assignment

PIN	Signal
2	CAN L
3	CAN GND
5	Shield
7	CAN H

DB9 male



Package Checklist

- 1 PCI Express board with standard bracket
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

CP-602U-I Series

2-port CAN Interface Universal PCI boards with 2 kV isolation

- CAN 2.0A and CAN 2.0B supported
- Two independent CAN communication ports
- CAN transfer rate up to 1 Mbps
- 2 kV electrical isolation
- LED for transmit/receive status on each port
- Optional 120 ohm terminal resistor for CAN bus network
- DLL library and examples included
- Windows driver provided

Overview

Moxa's new CP-602U-I CAN (Controller Area Network) interface board supports the Universal PCI interface. As a stand-alone CAN controller, the CP-602U-I is a cost-effective solution that provides two active CAN controllers with a DB9 connector on the same board. The CP-602U-I CAN interface board uses the NXP SJA1000 and transceiver PCA82C251, which provide the bus arbitration and error detection. The -40 to 85°C wide operating temperature (CP-602U-I-T only) and 2 kV isolation make the boards suitable for use in harsh industrial environments.

Specifications

Hardware

Connectors: DB9 male x 2
CAN Controller: NXP SJA1000
CAN Transceiver: PCA82C251
CAN Specification: CAN 2.0 A/B
Signal Support: CAN_H, CAN_L, GND
Transfer Rate: 1 Mbps
Max. Number of Boards per PC: 4
Electrical Isolation: 2 kV
Termination Resistor: 120 ohm (selected by jumper)
Card Interface: Universal PCI

Driver Support

Windows: Windows 2000, Windows XP/2003/Vista/2008 (x86/x64)

Software

Libraries: Visual C/C++, Borland C/C++

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11

MTBF (mean time between failures)

Time: 1,989,990 hrs
Standard: Telcordia (Bellcore) SR-332

Power Requirements

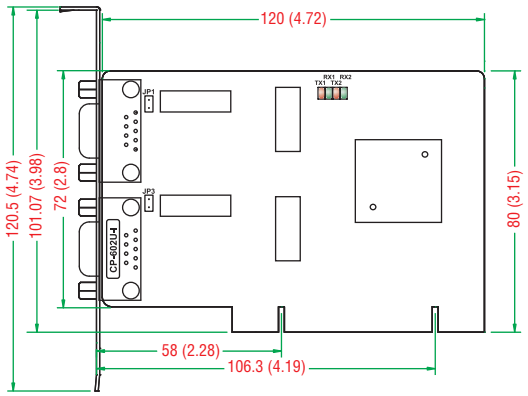
Input Current: 365 mA @ 5 VDC

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

CP-602U-I: 2-port CAN interface Universal PCI board, with 2 kV electrical isolation, 0 to 55°C operating temperature
CP-602U-I-T: 2-port CAN interface Universal PCI board with 2 kV electrical isolation, -40 to 85°C operating temperature

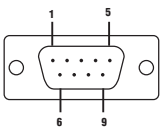
Connection Options (can be purchased separately)

CBL-F9M9-150: DB9-F to DB9-M serial cable, 150 cm
CBL-F9M9-20: DB9-F to DB9-M serial cable, 20 cm

Pin Assignment

PIN	Signal
2	CAN L
3	CAN GND
5	Shield
7	CAN H

DB9 male



Package Checklist

- 1 Universal PCI board with standard bracket
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

CB-602I Series

2-port CAN interface PC/104-Plus modules with 2 kV isolation

- CAN 2.0A and CAN 2.0B supported
- Two independent CAN communication ports
- CAN transfer rate up to 1 Mbps
- 2 kV electrical isolation
- LED for transmit/receive status on each port
- Optional 120 ohm terminal resistor for CAN bus network
- DLL library and examples included
- Windows drivers provided

Overview

Moxa's new CB-602I CAN (Controller Area Network) interface board supports the PC/104-Plus interface. Optional DB9 and DB25 connection cables are available for connecting to CAN interface device. The CB-602I CAN interface board uses the NXP SJA1000 and transceiver PCA82C251, which provide the bus arbitration and error detection. The -40 to 85°C wide operating temperature (CB-602I-T only) and 2 kV isolation make the boards suitable for use in harsh industrial environments.

Specifications

Hardware

Connector: 20-pin box header
CAN Controller: NXP SJA1000
CAN Transceiver: PCA82C251
CAN Specification: CAN 2.0 A/B
Signal Support: CAN_H, CAN_L, GND
Transfer Rate: 1 Mbps
Max. Number of Boards per PC: 4
Electrical Isolation: 2 kV
Termination Resistor: 120 ohms (selected by jumper)

Driver Support

Windows: Windows 2000, Windows XP/2003/Vista/2008 (x86/x64)
Note: Please refer to Moxa's website for the latest driver support information.

Software

Libraries: Visual C/C++, Borland C/C++

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11

MTBF (mean time between failures)

Time: 248,563 hrs
Standard: Telcordia (Bellcore) TR/SR

Power Requirements

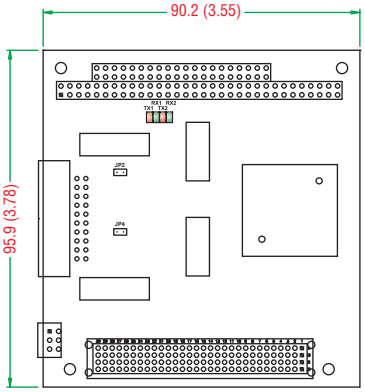
Input Current: 380 mA @ 5 VDC

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

CB-602I: 2-port CAN interface PC/104-Plus module with 2 kV electrical isolation, 0 to 55°C operating temperature

CB-602I-T: 2-port CAN interface PC/104-Plus module with 2 kV electrical isolation, -40 to 85°C operating temperature

Connection Options (can be purchased separately)

CBL-F20M25x2-50: F20 to 2 x DB25-M cable, 50 cm

Package Checklist

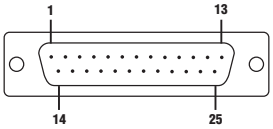
- 1 PC/104-Plus Module
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

CBL-F20M25x2-50

20-pin box header to DB25 male x 2 connection cable, 50 cm

PIN	Signal
2	CAN GND
3	CAN L
4	CAN H
7	Shield

DB25 male



Industrial USB

Product Selection Guide

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USB-to-Serial Converters

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Power Accessories

Power Accessory Selection Guide 13-26

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Industrial USB

USB-to-Serial Converters

	UPort® 1110	UPort® 1130 UPort® 1130I	UPort® 1150	UPort® 1150I	UPort® 1250	UPort® 1250I	UPort® 1410	UPort® 1450	UPort® 1450I
USB Interface									
Compliance	USB 1.1/2.0 compliant								
Connector	USB Type A			USB Type B					
Speed	12 Mbps (Full-Speed USB)				480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)				
Serial Interface									
Number of Ports	1 x RS-232	1 x RS-422/485	1 x RS-232/422/485		2 x RS-232/422/485		4 x RS-232	4 x RS-232/422/485	
Connector	DB9 male								
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark								
Flow Control	RTS/CTS, XON/XOFF								
FIFO	64 bytes				128 bytes				
Baudrate	50 bps to 921.6 kbps								
Embedded ESD Protection	15 kV								
Electrical Isolation	–	2 kV (UPort 1130I)	–	2 kV	–	2 kV	–	–	2 kV
Driver Support									
Windows 98/ME	✓	✓	✓	✓	–	–	–	–	–
Windows 2000	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows XP/2003 x86/x64	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows Vista x86/x64	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 7 x86/ x64	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 8/8.1 x86/x64	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 10 x86/ x64	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 2012 x64	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 2008 R2/2012 R2 x64	✓	✓	✓	✓	✓	✓	✓	✓	✓
WinCE 5.0/6.0	✓	✓	✓	✓	✓	✓	✓	✓	✓
Linux 2.4.x	✓	✓	✓	✓	✓	✓	✓	✓	✓
Linux 2.6.x	✓	✓	✓	✓	✓	✓	✓	✓	✓
Linux 3.x	✓	✓	✓	✓	✓	✓	✓	✓	✓
Physical Characteristics									
Housing	ABS + PC			SECC sheet metal (1 mm)					
Product Weight	60 g (0.13 lb)			75 g (0.65 lb)	180 g (0.40 lb)		720 g (1.59 lb)		
Packaged Weight	200 g (7.05 lb)			320 g (0.72 lb)	370 g (0.82 lb)	680 g (1.5 lb)	1345 g (2.96 lb)		
Dimensions	37.5 x 20.5 x 60 mm (1.48 x 0.81 x 2.36 in)			52 x 80 x 22 mm (2.05 x 3.15 x 0.87 in)	77 x 26 x 111 mm (3.03 x 1.02 x 4.37 in)		204 x 30 x 125 mm (8.03 x 1.18 x 4.92 in)		
Environmental Limits									
Operating Temperature	0 to 55°C (32 to 131°F)								
Ambient Relative Humidity	5 to 95% (non-condensing)								
Storage Temperature	-20 to 70°C (-4 to 158°F)								
Standards and Certifications									
Safety	–	–	–	–	UL 60950-1				
EMC	EN 55022/24				EN 55022/24				
EMI	CISPR 22, FCC Part 15B Class B				CISPR 22, FCC Part 15B Class A				
EMS	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m IEC 61000-4-8 PFMF				IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV IEC 61000-4-5 Surge: Power: 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m IEC 61000-4-8 PFMF				
Power Requirements									
Input Voltage	5 VDC				5 VDC	12 to 48 VDC	5 VDC for USB port 12 to 48 VDC for external adapter		12 to 48 VDC
Input Current	30 mA @ 5 VDC	60 mA @ 5 VDC	77 mA @ 5 VDC	260 mA @ 5 VDC	360 mA @ 5 VDC	200 mA @ 12 VDC	5 VDC, 0.5 A for USB port 12 to 48 VDC, 260 mA for external adapter		12 to 48 VDC, 360 mA external adapter
Reliability									
MTBF (Time)	Time: 1,949,025 hrs Standard: Telcordia (Bellcore), GB				Time: 563,179 hrs Standard: Telcordia (Bellcore), GB		Time: UPort 1410: 394,441 hrs UPort 1450/1450I: 546,770 hrs Standard: UPort 1410: MIL-HDBK-217F UPort 1450/1450I: Telcordia (Bellcore), GB		
Warranty	5 years (see www.moxa.com/warranty)								
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USB-to-Serial Converters

	UPort® 1610-8	UPort® 1650-8	UPort® 1610-16	UPort® 1650-16	UPort® 2210	UPort® 2410
USB Interface						
Compliance	USB 1.1/2.0 compliant					
Connector	USB Type B					
Speed	480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)					
Serial Interface						
Number of Ports	8 x RS-232	8 x RS-232/422/485	16 x RS-232	16 x RS-232/422/485	2 x RS-232	4 x RS-232
Connector	DB9 male					
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark					
Flow Control	RTS/CTS, XON/XOFF					
FIFO	128 bytes				16 bytes	
Baudrate	50 bps to 921.6 kbps					
Embedded ESD Protection	15 kV					
Driver Support						
Windows 98/ME	–	–	–	–	–	–
Windows 2000	✓	✓	✓	✓	✓	✓
Windows XP/2003 x86/x64	✓	✓	✓	✓	✓	✓
Windows Vista x86/x64	✓	✓	✓	✓	✓	✓
Windows 2008 x86/x64	✓	✓	✓	✓	✓	✓
Windows 7 x86/ x64	✓	✓	✓	✓	✓	✓
Windows 8/8.1 x86/x64	✓	✓	✓	✓	✓	✓
Windows 10 x86/ x64	✓	✓	✓	✓	✓	✓
Windows 2012 x64	✓	✓	✓	✓	✓	✓
WinCE 5.0/6.0	✓	✓	✓	✓	–	–
Linux 2.4.x	✓	✓	✓	✓	–	–
Linux 2.6.x	✓	✓	✓	✓	✓	✓
Linux 3.x	✓	✓	✓	✓	✓	✓
Physical Characteristics						
Housing	SECC sheet metal (1 mm)				Polycarbonate (PC)	
Product Weight	835 g (1.84 lb)		2475 g (5.45 lb)		120 g (0.26 lb)	210 g (0.46 lb)
Packaged Weight	1435 g (3.16 lb)		3485 g (7.68 lb)		325 g (0.72 lb)	455 g (1 lb)
Dimensions (mm)	204 x 44 x 125 mm (8.03 x 1.73 x 4.92 in)		440 x 45.5 x 198.1 mm (17.32 x 1.79 x 7.80 in)		70 x 35 x 120 mm (2.76 x 1.38 x 4.72 in)	80 x 35 x 185 mm (3.15 x 1.38 x 7.28 in)
Environmental Limits						
Operating Temperature	0 to 55°C (32 to 131°F)					
Operating Humidity	5 to 95% (non-condensing)					
Storage Temperature	-20 to 75°C (-4 to 167°F)					
Standards and Certifications						
Safety	UL 60950-1					
EMC	EN 55022/24					
EMI	CISPR 22, FCC Part 15B Class A				CISPR 22, FCC Part 15B Class B	
EMS	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV IEC 61000-4-5 Surge: Power: 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m IEC 61000-4-8 PFMF				IEC 61000-4-2 ESD: Contact: 8 kV; Air: 4 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV IEC 61000-4-5 Surge: Power: 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m IEC 61000-4-8 PFMF	
Power Requirements						
Input Voltage	12 to 48 VDC		100 to 240 VAC		5 VDC	
Input Current	230 mA @ 12 VDC	340 mA @ 12 VDC	130 mA @ 100 VAC	150 mA @ 100 VAC	140 mA @ 5 VDC	240 mA @ 5 VDC
Reliability						
MTBF (Time)	Time: 208,413 hrs Standard: MIL-HDBK-217F	Time: 186,567 hrs Standard: MIL-HDBK-217F	Time: 138,704 hrs Standard: MIL-HDBK-217F	Time: 120,001 hrs Standard: MIL-HDBK-217F	Time: 4,221,778 hrs Standard: Telcordia (Bellcore), GB	Time: 3,901,775 hrs Standard: Telcordia (Bellcore), GB
Warranty	5 years (see www.moxa.com/warranty)					
Page	13-16	13-16	13-18	13-18	13-20	13-20

USB Hubs

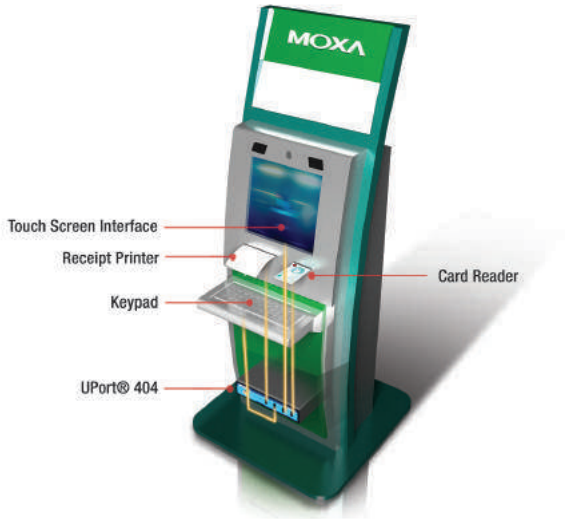
		UPort® 404/404-T	UPort® 407/407-T	UPort® 204	UPort® 207
USB Interface					
Compliance		USB 1.1/2.0 compliant			
Upstream USB Ports		1 (Type B)			
Downstream USB Ports		4 (Type A)	7 (Type A)	4 (Type A)	7 (Type A)
Speed		480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)			
Supply Current		500 mA max. per channel			
Physical Characteristics					
Housing		Aluminum		Polycarbonate (PC)	
Product Weight		850 g (1.87 lb)	950 g (2.1 lb)	800 g (1.76 lb)	875 g (1.93 lb)
Packaged Weight		855 g (1.88 lb)	965 g (2.13 lb)	805 g (1.87 lb)	890 g (1.96 lb)
Dimensions		80 x 35 x 130 mm (3.15 x 1.38 x 5.12 in)	100 x 35 x 192 mm (3.94 x 1.38 x 7.55 in)	70 x 35 x 120 mm (2.76 x 1.38 x 4.72 in)	80 x 35 x 185 mm (3.15 x 1.38 x 4.72 in)
Environmental Limits					
Operating Temperature	Standard Temperature	0 to 60°C (32 to 140°F)		0 to 60°C (32 to 140°F)	
	Wide Temperature	-40 to 85°C (-40 to 185°F)			
Operating Humidity		5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Storage Temperature		-40 to 85°C (-40 to 185°F)		-20 to 75°C (-4 to 167°F)	
Standards and Certifications					
Safety		UL 508			
EMC		EN 55022/24, EN 61000-6-2/6-4			
EMI		CISPR 22, FCC Part 15B Class A			
EMS		IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 2 kV IEC 61000-4-5 Surge: Power: 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m IEC 61000-4-8 PFMF			
Power Requirements					
Input Voltage		12 to 40 VDC			
Input Current		1.3 A @ 12 VDC	2.3 A @ 12 VDC	1.21 A @ 12 VDC	2.17 A @ 12 VDC
Reliability					
MTBF (Time)		Time: 1,490,340 hrs Standard: Telcordia (Bellcore), GB	Time: 1,111,361 hrs Standard: Telcordia (Bellcore), GB	Time: 1,577,573 hrs Standard: Telcordia (Bellcore), GB	
Warranty		5 years (see www.moxa.com/warranty)			
Page		13-22	13-22	13-24	13-24

Introduction to USB Connectivity

Moxa's UPort® line of USB connectivity products includes a wide range of solutions for connecting COM ports or USB ports to a PC through the PC's USB port. Moxa's UPort® products are designed to provide true USB 2.0 Hi-Speed 480 Mbps data transmission through each port, come with LED indicators for easy monitoring, and are even suitable for heavy-load applications. The UPort® product line includes USB-to-serial converters with 1, 2, 4, 8, or 16 independent RS-232, RS-422/485, and RS-232/422/485 serial ports for connecting data acquisition equipment and many other types of serial devices to notebooks and desktop PCs, and USB hubs with 4 or 7 USB ports for expanding the number of built-in USB ports on a host PC.

Available Products

USB-to-serial converters: UPort® 1000 and UPort® 2000 series
USB hubs: UPort® 200 and UPort® 400 series



Instant Plug & Play

UPort® products allow you to connect serial devices or USB devices to your laptop or workstation through a USB (Universal Serial Bus) port. These plug & play USB solutions are perfect for mobile, instrumentation, and point-of-sale applications.

USB-IF Certified

Moxa's UPort® 200 and UPort® 400 series of USB 2.0 hubs have passed USB-IF (USB Implementers Forum) certification, which verifies that products meet a number of strict electrical requirements for Hi-Speed USB operation designed to the USB 2.0 specifications. This means that the UPort® 200/400 series supports Hi-Speed USB 2.0 for up to 480 Mbps USB transmission, is fully compliant with the requirements for interoperability, provides enough power to attached devices, and can transition back to high-speed operation from the suspend state.

Reduce Short- and Long-Term Costs

For many applications, system integrators are moving towards using either serial-to-Ethernet or USB-to-serial products to connect serial devices to a PC. The overall costs of setting up an application is reduced, not only from a short-term hardware investment perspective, but also by reducing costs associated with long-term management and integration. Another big plus to using Moxa's USB-to-serial solutions is that each product supports a broad range of operating systems. Drivers are available for Windows 2012 x64, Windows XP/2003/Vista/2008/7/8/8.1/10 x86/x64, Windows 98/ME/2000, WinCE 5.0/6.0, and Linux 2.4.x, 2.6.x, 3.0.x.

ESD Level 4 Protection

Electrostatic discharge (ESD) could be as severe as having more than 1,000 volts of ESD with a high rise-time (dv/dt) break through the junction layer of protective devices. In order to avoid serious damage, Moxa's UPort® 400 series USB hubs provide ESD level 4 (contact 8 kV, air 15 kV) protection, which increases the quality and value of the user's end-product.

RS-232/422/485 Support

Moxa's UPort® 1000/2000 series of USB-to-serial products includes models that support some or all of the RS-232/422/485 serial interfaces. The full slate of RS-232 signals (TxD, RxD, DTR, DSR, RTS, CTS, DCD) is supported, and both 2-wire and 4-wire RS-485 can be used. Many of Moxa's USB-to-serial products use DB9 male connectors for the serial ports, and for industrial applications, the DB9 female to terminal block accessory can be used. In addition, users can select baudrates up to 921.6 kbps and make use of the 128-byte FIFO.

Always Enough Power

Some UPort® models support both bus power and external power through the power adapter. Bus power can be used with laptop and workstation connections that support a 500 mA output for USB devices. An external power adapter can be used if your computer's USB port does not provide enough amperage to run the UPort®.

Top Serial Performance

Moxa's 25-plus years of experience in serial board design is now built into a new top performance CPU called MOXA ART. This chip equips the UPort® converters with USB 2.0 (Hi-Speed 480 Mbps), a 128-byte FIFO, on-chip hardware and software flow control, and burst data mode, making Moxa's UPort® converters perform far better than the competition.

Patented COM Preserver

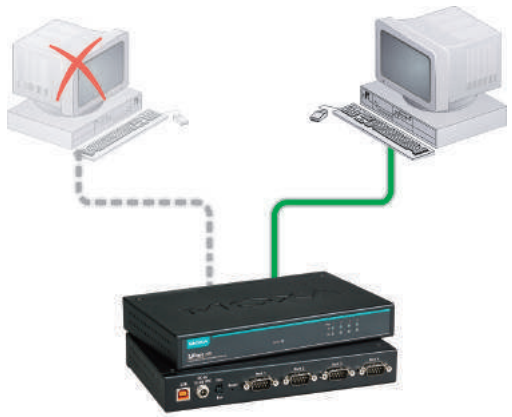
Serial transmission applications use names such as COM3 and COM4 to identify COM ports. Unfortunately, most USB-to-serial products are unable to use fixed COM names on the host PC. This means that the names of the COM ports change when the USB-to-serial device is plugged into a different USB port, either on the same or a different PC, forcing the user to reconfigure the COM names manually from within the application.

Moxa's UPort® 1200/1400/1600 USB-to-serial hubs have an advanced feature that allows them to use fixed COM names. When the user enables the "COM Preserver™" function, the COM names "go with" the UPort® device. In fact, Moxa's drivers can even create the same COM port names on a different host PC. With this feature, you do not need to modify application programs, or rebuild the entire project every time you install a new operating system or upgrade the computer. Don't worry about moving the UPort® from one USB hub to another, or even from one computer to another. Once the COM Preserver™ function is enabled, the names of the USB-to-serial COM ports will go with the UPort® wherever it is used.

Note that the COM Preserver™ function is disabled by default. Users can use the traditional method of enumerating COM ports, or enable the COM Preserver™ function to make use of this great new feature.

Scenario 1

COM port assignment is maintained across different PCs



Scenario 2

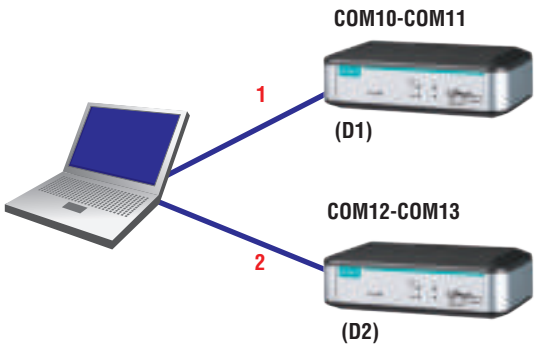
COM port assignment is maintained across different USB ports

Fixed-Base COM Mode

Moxa's UPort® 1000 series and UPort® 2000 series of products provide a unique fixed-base COM function that allows users to set a specific initial COM port number. Regardless of which UPort® is plugged into the host, the COM port numbers for the UPort®'s serial ports will be numbered sequentially starting with the initial COM port number.

For example, assume that you have set COM10 as the first COM number that will be assigned. If UPort® D1 is plugged into your computer first, your computer will assign COM10 and COM11 to the UPort®'s serial ports. When UPort® D2 is plugged in, the computer will assign COM numbers COM12 and COM13.

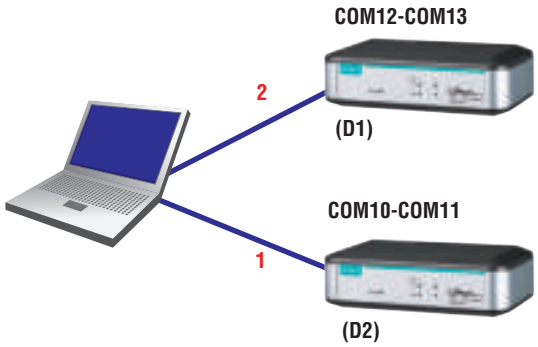
Scenario 3



If both UPorts are unplugged from the computer, and UPort® D2 has been plugged back in, the computer will assign COM10 and COM11 to the UPort's serial ports. When UPort® D1 is plugged back in, COM numbers COM12 and COM13 will be assigned the UPort's serial ports.

When "Fixed-base COM Mode" is enabled for the first time, all COM port numbers and serial port parameters will be reset to their default values. You can then set the COM numbers and configuration parameters to the values needed for your application.

Scenario 4



Function Support Table

Model	Serial Number	Fixed-Base COM	COM Preserver
UPort® 1100 Series	–	✓	–
UPort® 1200/1400/1600 Series	✓	✓	✓
UPort® 2000 Series	–	✓	–

COM Port Numbers Displayed in Windows System Tray

When using a UPort® to connect a serial device to your PC, it may be necessary to determine the COM port number assigned to the serial device. A new tool provided by Moxa gives engineers a handy means of monitoring the COM port number of the device. When the UPort® is plugged into your computer's USB port, a UPort® icon will be placed in the Windows System Tray located in the lower right corner of the desktop. Simply position the cursor over the UPort® icon, and an information window showing the COM port number will pop up. When two or more UPorts are connected to the same computer, the pop-up window will show the COM numbers for all of the UPorts.

UPort® Models Listed by Interface and Number of Ports

USB-to-Serial Converters

Interface	No. of Ports	Model Name
RS-232	1	UPort® 1110
	2	UPort® 2210
	4	UPort® 1410
		UPort® 2410
	8	UPort® 1610-8
	16	UPort® 1610-16
RS-422/485	1	UPort® 1130/1130I
RS-232/422/485	1	UPort® 1150/1150I
	2	UPort® 1250/1250I
	4	UPort® 1450/1450I
	8	UPort® 1650-8
	16	UPort® 1650-16

USB Hubs

Interface	No. of Ports	Model Name
USB	4	UPort® 204
	4	UPort® 404
	7	UPort® 207
	7	UPort® 407
	4	UPort® 404-T
	7	UPort® 407-T

Important Considerations for USB Devices in Industrial Applications

USB (Universal Serial Bus) is the most popular interface in the IT industry today. In recent years, USB has also gained popularity in industrial applications as more and more devices support the interface. But industrial operations are more demanding than your typical office application and require additional considerations. For example, a factory floor may be subject to extreme temperatures that are too hot for a consumer-grade USB hub to handle. Industrial applications also require a higher level of reliability because system downtime is not only costly but potentially dangerous. To ensure that your USB devices meet these demands, system engineers should consider the following factors when selecting a USB device for industrial environments.

USB-IF Certification

Although any vendor can design a USB product that meets the USB specifications, the product may not have been tested for flaws. When considering which USB product to buy, you should make sure that the product has received USB-IF certification, and that the product is listed in the USB-IF Integrators List on the USB-IF website. Products that are certified to carry the USB logo have been tested for both reliability and interoperability.

Moxa's USB 2.0 Hubs First to Receive USB-IF Certification

Moxa's new line of industrial-grade USB hubs, the UPort® 200 and UPort® 400 series, are the world's first to receive USB-IF certification for reliable peripheral plug-and-play devices. The hubs are designed to provide true USB 2.0 Hi-Speed 480 Mbps data transmission through each port, even for heavy-load applications. As USB-IF certified products, the UPort® 200 and UPort® 400 series have passed high-speed compliance testing and are eligible to bear the official USB logo.

The UPort® 200 and UPort® 400 series are external plug-and-play hubs that can be plugged into a standard USB port for instant peripheral device connectivity. For industrial networks, high reliability can never be compromised. As defined by the USB-IF (USB Implementers Forum), certification for Moxa's UPort® USB hubs guarantees:

- 480 Mbps USB 2.0 transmissions
- Device accessibility
- Full power for connected devices
- High-speed operation from suspend mode

To guard against serious damage, the UPort® 200 and UPort® 400 series have doubled their ESD protection from Level 2 (4 kV) to Level 4 (8 kV) to provide 8 kV of ESD protection for direct contact and 15 kV of ESD protection for contact through the air. Wide temperature range models (UPort® 200-T and UPort® 400-T) are also available for use in extreme temperatures, ranging anywhere from -40 to 85°C.

UPort® 1100 Series

1-port RS-232, RS-422/485, and RS-232/422/485 USB-to-serial converters

Terminal Block Adapter for the UPort® 1130/1130I/1150/1150I

- Compatible with USB 2.0
- 12 Mbps USB data rate
- 921.6 kbps maximum baudrate for super fast data transmission
- Drivers provided for Windows, WinCE, and Linux
- Mini DB9 female to terminal block adapter for easy wiring
- LEDs for indicating USB and TxD/RxD activity
- 2 kV electrical isolation (UPort 1130I and 1150I)

Overview

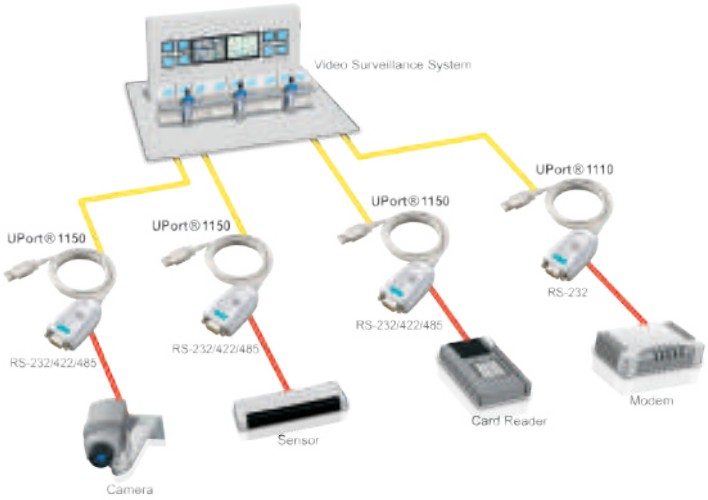
The UPort® 1100 series USB-to-serial converters are the perfect accessory for laptop computers that do not have a serial port, and they are essential for engineers who need to connect different serial devices in the field or separate interface converters for devices without a standard COM port or DB9 connector. The UPort® 1110 converts from USB to RS-232, the UPort® 1130/1130I from USB to RS-422/485, and the UPort® 1150/1150I from USB to RS-232/422/485. All products are compatible with new and legacy serial devices, and can be used with mobile, instrumentation, and point-of-sale applications.

Typical Application—Surveillance Monitoring System

The most basic video surveillance setup consists of a single camera connected directly to a monitor and recording device. However, many businesses require video surveillance on a larger scale requiring a dedicated management system. Existing management systems often lack device-port versatility, making converters a necessity when connecting different devices. Management systems that need USB-to-serial converters for serial devices such as card readers, modems, video cameras, and sensors, now have a simple solution. Moxa's UPort® 1100 converters provide plug-and-play serial device connectivity without having to install new adapter boards, which usually requires opening of computer/server chassis. Also, a unique driver allows the UPort® 1100 to retain COM port numbers when they have been unplugged and then reconnected again, even into a new USB port.

UPort® 1100 convenient characteristics include:

- USB 2.0 compatibility
- RS-232 or RS-422/485 interface
- Stability and reliability
- Cost-effective
- Plug-and-play
- Easy to use



Specifications

USB Interface
Compliance: USB 1.0/1.1 compliant, USB 2.0 compatible
Connector:
UPort 1110/1130/1130I/1150: USB Type A
UPort 1150I: USB Type B
Speed: 12 Mbps (Full-Speed USB)

Serial Interface
Number of Ports: 1
Serial Standards:
UPort 1110: RS-232
UPort 1130/1130I: RS-422/485
UPort 1150/1150I: RS-232/422/485
Connector: DB9 male
Electrical Isolation: 2 kV (UPort 1130I and 1150I)

Performance
Baudrate: 50 bps to 921.6 kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
FIFO: 64 bytes

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND
RS-485 Data Direction: ADDC® (Automatic Data Direction Control)

Operating Systems
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2012 (x64), Windows Embedded CE 5.0/6.0
Linux Real TTY Drivers: Linux 2.4.x, 2.6.x, 3.x
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Housing:
UPort 1110/1130/1130I/1150: ABS + PC
UPort 1150I: Metal
Weight:
UPort 1110/1130/1130I/1150:
Product only: 65 g (0.14 lb)
Packaged: 200 g (0.44 lb)
UPort 1150I:
Product only: 75 g (0.65 lb)
Packaged: 320 g (0.72 lb)
Dimensions:
UPort 1110/1130/1130I/1150:
37.5 x 20.5 x 60 mm (1.48 x 0.81 x 2.36 in)
UPort 1150I:
52 x 80 x 22 mm (2.05 x 3.15 x 0.87 in)

Environmental Limits
Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 70°C (-4 to 158°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m
IEC 61000-4-8 PFMF

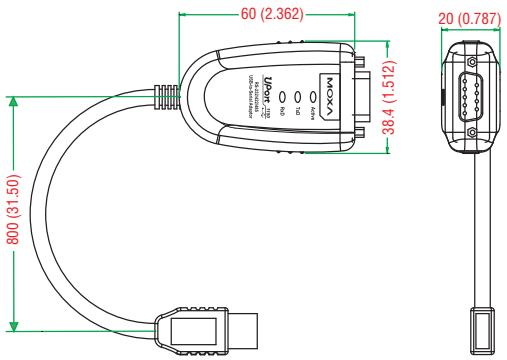
Power Requirements
Input Voltage: 5 VDC
Input Current:
UPort 1110: 30 mA @ 5 VDC
UPort 1130: 60 mA @ 5 VDC
UPort 1130I: 65 mA @ 5 VDC
UPort 1150: 77 mA @ 5 VDC
UPort 1150I: 260 mA @ 5 VDC

MTBF (mean time between failures)
Time: 1,949,025 hrs
Standard: Telcordia (Bellcore), GB

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

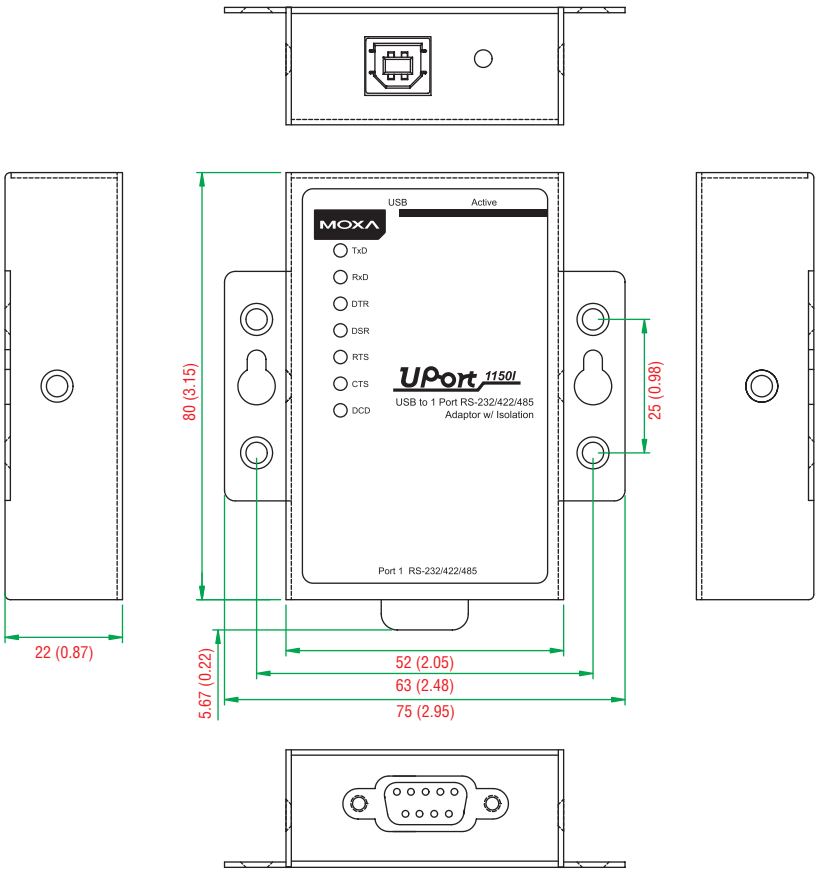
Cable-Type Dimensions

Unit: mm (inch)



Dimensions

Unit: mm (inch)



Ordering Information

Available Models

UPort 1110: 1-port RS-232 USB-to-serial converter
UPort 1130: 1-port RS-422/485 USB-to-serial converter
UPort 1130I: 1-port RS-422/485 USB-to-serial converter with 2 kV electrical isolation
UPort 1150: 1-port RS-232/422/485 USB-to-serial converter
UPort 1150I: 1-port RS-232/422/485 USB-to-serial converter with 2 kV electrical isolation

Optional Accessories (can be purchased separately)

Mini DB9F-to-TB: DB9 female to terminal block connector
CBL-USBA/B-100: USB Type A to USB Type B cable, 100 cm
CBL-F9M9-150: DB9 female to DB9 male serial cable, 150 cm
CBL-F9M9-20: DB9 female to DB9 males serial cable, 20 cm
CBL-RJ45SF9-150: RJ45 to DB9 female shielded serial cable, 150 cm
ADP-RJ458P-DB9: DB9 female to RJ45 connector
A-ADP-RJ458P-DB9F-ABC01: DB9 female to RJ45 connector

Cable-Type Package Checklist

- 1 UPort 1110 or 1130 or 1130I or 1150 USB-to-serial converter
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Note: The UPort 1130/1130I/1150 also come with 1 mini DB9F-to-TB serial connector.

UPort 1150I Package Checklist

- 1 UPort 1150I USB-to-serial converter
- USB cable: CBL-USBA/B-100
- Velcro lock-down strap for the USB cable
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

UPort® 1250/1250I

2-port RS-232/422/485 USB-to-serial converters with optional 2 kV isolation

UPort® 1250

UPort® 1250I

- Hi-Speed USB 2.0 for up to 480 Mbps USB transmission
- 921.6 kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- 15N high retention type B connector
- Supports fixed-base COM Utility for setting the initial extended COM port number
- Drivers provided for Windows, WinCE, and Linux
- LEDs for easy monitoring
- Locking power jack

Overview

The UPort® 1250/1250I USB-to-serial converters allow you to connect 2 RS-232/422/485 devices to your laptop or workstation through the USB (Universal Serial Bus) port. These plug & play USB solutions are perfect for mobile, instrumentation, and point-of-sale applications.

Specifications

USB Interface

Compliance: USB 1.1/2.0 compliant
Connector: USB Type B
Speed: 480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)

Serial Interface

Number of Ports: 2
Serial Standards: RS-232/422/485
Connector: DB9 male
Electrical Isolation: 2 kV (UPort 1250I only)

Performance

Baudrate: 50 bps to 921.6 kbps (including 500 kbps)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
FIFO: 128 bytes

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND
RS-485 Data Direction: ADDC® (Automatic Data Direction Control)

Operating Systems

Windows Real COM Drivers: Windows 2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2012 (x64), Windows Embedded CE 5.0/6.0
Linux Real TTY Drivers: Linux 2.4.x, 2.6.x, 3.x
Android Driver: Android 3.1.x and later
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics

Housing: SECC sheet metal (1 mm)
Weight:
Product only: 180 g (0.40 lb)
Packaged:
UPort 1250: 370 g (0.82 lb)
UPort 1250I: 680 g (1.5 lb)
Dimensions: 77 x 26 x 111 mm (3.03 x 1.02 x 4.37 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 75°C (-4 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV
IEC 61000-4-5 Surge: Power: 1 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m
IEC 61000-4-8 PFMF
Green Product: RoHS, CRoHS, WEEE

Power Requirements

Input Voltage:
UPort 1250: 5 VDC
UPort 1250I: 12 to 48 VDC
Input Current:
UPort 1250: 360 mA @ 5 VDC
UPort 1250I: 200 mA @ 12 VDC

MTBF (mean time between failures)

Time: 563,179 hrs
Telcordia (Bellcore), GB

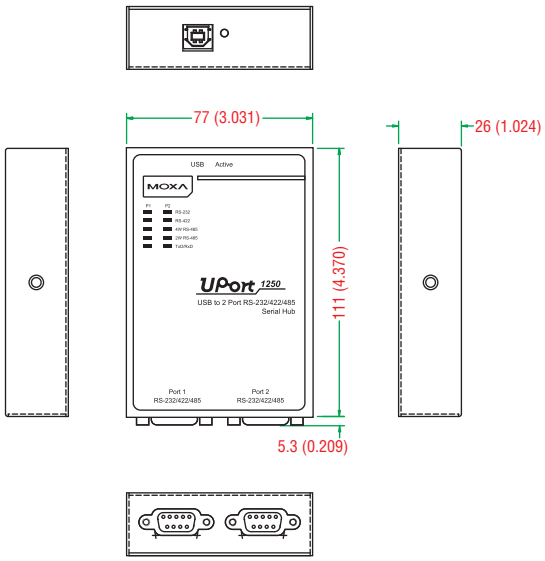
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

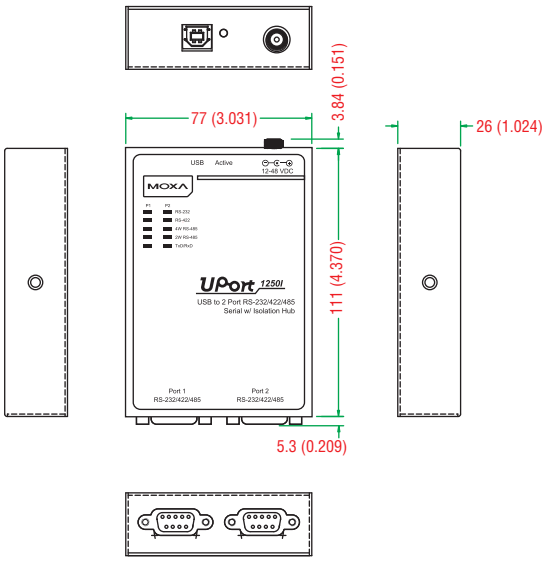
Dimensions

Unit: mm (inch)

UPort® 1250



UPort® 1250I



Ordering Information

Available Models

UPort 1250: 2-port RS-232/422/485 USB-to-serial converter
UPort 1250I: 2-port RS-232/422/485 USB-to-serial converter with 2 kV electrical isolation, adaptor included

Optional Accessories (can be purchased separately)

DK35A: 35-mm DIN-rail mounting clips; 2 DIN-rail plates with 4 screws
Mini DB9F-to-TB: DB9 female to terminal block connector
CBL-USBA/B-100: USB Type A to USB Type B cable, 100 cm
CBL-F9M9-150: DB9 female to DB9 male serial cable, 150 cm
CBL-F9M9-20: DB9 female to DB9 males serial cable, 20 cm
CBL-RJ45SF9-150: RJ45 to DB9 female shielded serial cable, 150 cm
ADP-RJ458P-DB9: DB9 female to RJ45 connector
A-ADP-RJ458P-DB9F-ABC01: DB9 female to RJ45 connector
DK-UP1200: DIN-rail/wall- mounting kit that includes 2 wall-mounting plates with 6 screws (WK-35-02), and 2 DIN-rail plates with 4 screws (DK35A)

Note: One power cord suitable for your region is included in the product package. Additional power adapters and power cords can be purchased separately. Please refer to the Power Accessory Selection Guide for details.

Package Checklist

- 1 UPort 1250 or 1250I USB-to-serial converter
- 1 serial adapter: mini DB9F-to-TB
- USB cable: CBL-USBA/B-100
- UPort 1250I only:
  > 100 to 240 VAC power adapter suitable for your region (excluding T models)
  > 1 power cord suitable for your region
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

DK-UP1200

Available Accessory

UPort® 1400 Series

4-port RS-232 and RS-232/422/485 USB-to-serial converters with optional 2 kV isolation

- Hi-Speed USB 2.0 for up to 480 Mbps USB transmission
- 921.6 kbps maximum baudrate for super fast data transmission
- 15N high retention USB Type B connector
- 128-byte FIFO and on-chip H/W, S/W flow control
- 2 kV electrical isolation (UPort 1450I only)
- Hassle-free COM port retention
- Supports fixed-base COM Utility for setting the initial extended COM port number
- Drivers provided for Windows/WinCE/Linux
- Choose bus power or external power (UPort 1410/1450 only)
- Locking power jack

Overview

The UPort® 1400 USB-to-serial converters allow you to connect 4 RS-232 or RS-232/422/485 devices to your laptop or workstation through the USB (Universal Serial Bus) port. The UPort® 1400 converters are compatible with new and legacy serial devices, and they are perfect for mobile, instrumentation, and point-of-sale applications.

Specifications

USB Interface
Compliance: USB 1.1/2.0 compliant
Connector: USB Type B
Speed: 480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)

Serial Interface
Number of Ports: 4
Serial Standards:
UPort 1410: RS-232
UPort 1450/1450I: RS-232/422/485
Connector: DB9 male
Electrical Isolation: 2 kV (UPort 1450I only)

Performance
Baudrate: 50 bps to 921.6 kbps (including 500 kbps)

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
FIFO: 128 bytes

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND
RS-485 Data Direction: ADDC® (Automatic Data Direction Control)

Operating Systems
Windows Real COM Drivers: Windows 2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2012 (x64), Windows Embedded CE 5.0/6.0
Linux Real TTY Drivers: Linux 2.4.x, 2.6.x, 3.x
Android Driver: Android 3.1.x and later
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Housing: SECC sheet metal (1 mm)
Weight:
Product only: 720 g (1.59 lb)
Packaged: 1345 g (2.96 lb)
Dimensions: 204 x 30 x 125 mm (8.03 x 1.18 x 4.92 in)

Environmental Limits
Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 75°C (-4 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV
IEC 61000-4-5 Surge: Power: 1 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m
IEC 61000-4-8 PFMF
Green Product: RoHS, CRoHS, WEEE

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current:
- UPort 1410/1450:
  0.5 A @ 5 VDC for USB port
  260 mA @ 12 VDC for external adapter
- UPort 1450I:
  360 mA @ 12 VDC external adapter

MTBF (mean time between failures)

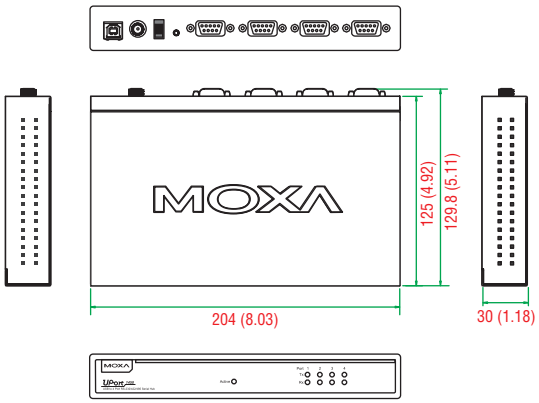
Time:
UPort 1410: 394,441 hrs
MIL-HDBK-217F
UPort 1450/1450I: 546,770 hrs
Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

UPort 1410: 4-port RS-232 USB-to-serial converter
UPort 1450: 4-port RS-232/422/485 USB-to-serial converter, adapter included
UPort 1450I: 4-port RS-232/422/485 USB-to-serial converter with 2 kV electrical isolation, adapter included

Optional Accessories (can be purchased separately)

DK35A: 35-mm DIN-rail mounting clips; 2 DIN-rail plates with 4 screws
Mini DB9F-to-TB: DB9 female to terminal block connector
CBL-USBA/B-100: USB Type A to USB Type B cable, 100 cm
CBL-F9M9-150: DB9 female to DB9 male serial cable, 150 cm
CBL-F9M9-20: DB9 female to DB9 males serial cable, 20 cm
CBL-RJ45SF9-150: RJ45 to DB9 female shielded serial cable, 150 cm
ADP-RJ458P-DB9: DB9 female to RJ45 connector
A-ADP-RJ458P-DB9F-ABC01: DB9 female to RJ45 connector
DK-UP1400: DIN-rail/wall- mounting kit that includes 2 wall-mounting plates with 6 screws (WK-35-01), and 2 DIN-rail plates with 4 screws (DK35A)
DIN-Rail Kit: DIN-rail kit with 2 screws (P/N: 1490000150011)

Note: One power cord suitable for your region is included in the product package. Additional power adapters and power cords can be purchased separately. Please refer to the Power Accessory Selection Guide for details.

DK-UP1400

Available Accessory

Package Checklist

- 1 UPort 1400 USB-to-serial converter
- USB cable: CBL-USBA/B-100
- UPort 1450/1450I only:
  > 1 serial adapter: mini DB9F-to-TB
  > 100 to 240 VAC power adapter suitable for your region (excluding T models)
  > 1 power cord suitable for your region
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

UPort® 1600-8 Series

8-port RS-232 and RS-232/422/485 USB-to-serial converters

- Hi-Speed USB 2.0 for up to 480 Mbps USB transmission
- 921.6 kbps maximum baudrate for super fast data transmission
- 15N high retention USB Type B connector
- 128-byte FIFO and on-chip H/W, S/W flow control
- COM port assignments maintained across different PCs
- Supports fixed-base COM Utility for setting the initial extended COM port number
- Mini DB9 female to terminal block adapter for easy wiring
- Drivers provided for Windows, WinCE, and Linux
- Locking power cord

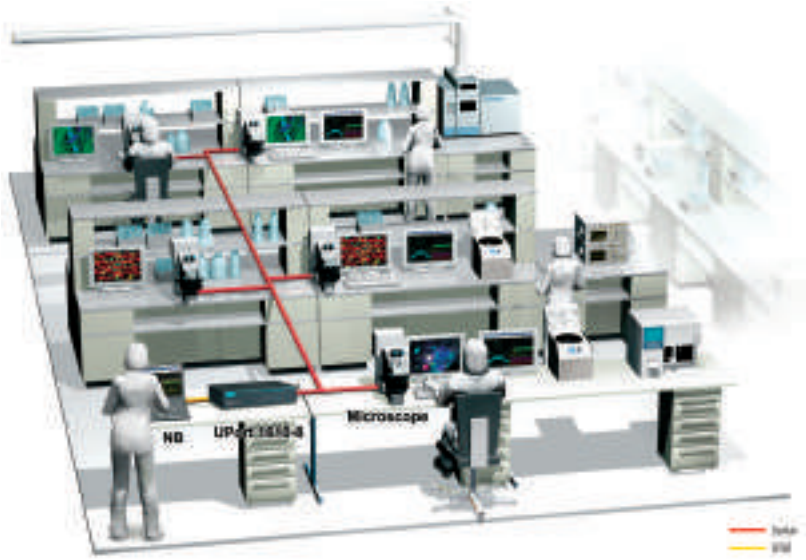
Overview

The UPort® 1600-8 USB-to-serial converters allow you to connect 8 RS-232 or RS-232/422/485 devices to your laptop or workstation through the USB (Universal Serial Bus) port. The UPort® 1600-8 converters are compatible with new and legacy serial devices, and they are perfect for instrumentation and manufacturing applications.

Typical Application Topology

Medical scientists and pharmaceutical researchers rely on sophisticated laboratory equipment to discover new treatments for patients. Most research is carried out in teams given the complex and collaborative nature of medical science. Scientists often transfer images and data from microscopes and other equipment to each other's laptops or desktop computers. Connecting all of these pieces of equipment usually requires multiple serial ports, one for each peripheral device. Since computers are only equipped with a limited number of serial ports, expanding a USB connection into multiple serial ports can provide researchers with the connectivity they need to make their next scientific breakthrough. Moxa's solution is the UPort® 1610-8, which is an RS-232 USB-to-serial converter that can be used to connect multiple serial interface microscopes and other equipment to a computer's USB port. The UPort® 1610-8 provides the following benefits:

- Up to 8 ports for easy USB-to-serial expansion
- True USB 2.0 high-speed transmission for large data transmission
- 128-byte FIFO and on-chip hardware and software flow control to ensure stable data transmission
- Easy troubleshooting with LED indicators for each serial port
- Compatibility with both laptop and desktop PCs



Specifications

USB Interface
Compliance: USB 1.1/2.0 compliant
Connector: USB Type B
Speed: 480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)

Serial Interface
Number of Ports: 8
Serial Standards:
UPort 1610-8: RS-232
UPort 1650-8: RS-232/422/485
Connector: DB9 male

Performance
Baudrate: 50 bps to 921.6 kbps (including 500 kbps)

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
FIFO: 128 bytes

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND
RS-485 Data Direction: ADDC® (Automatic Data Direction Control)

Operating Systems
Windows Real COM Drivers: Windows 2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2012 (x64), Windows Embedded CE 5.0/6.0
Linux Real TTY Drivers: Linux 2.4.x, 2.6.x, 3.x
Android Driver: Android 3.1x and later
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Housing: SECC sheet metal (1 mm)
Weight:
Product only: 835 g (1.84 lb)
Packaged: 1435 g (3.16 lb)
Dimensions: 204 x 44 x 125 mm (8.03 x 1.73 x 4.92 in)

Environmental Limits
Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 75°C (-4 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

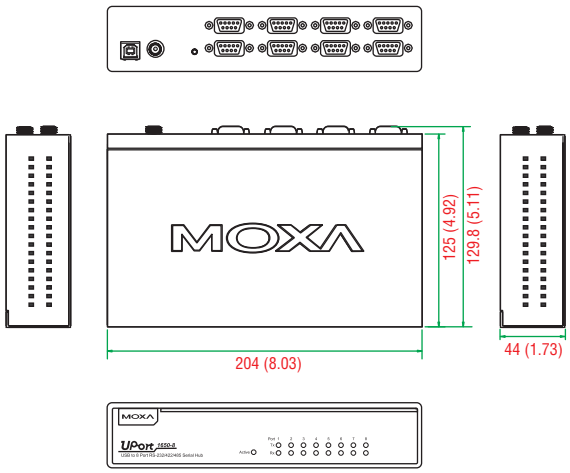
Standards and Certifications
Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV
IEC 61000-4-5 Surge: Power: 1 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m
IEC 61000-4-8 PFMF
Green Product: RoHS, CRoHS, WEEE

Power Requirements
Input Voltage: 12 to 48 VDC
Input Current: 580 mA @ 12 VDC

MTBF (mean time between failures)
Time:
UPort 1610-8: 208,413 hrs
UPort 1650-8: 186,567 hrs
MIL-HDBK-217F

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions
Unit: mm (inch)



Ordering Information

Available Models
UPort 1610-8: 8-port RS-232 USB-to-serial converter, adapter included
UPort 1650-8: 8-port RS-232/422/485 USB-to-serial converter, adapter included

Optional Accessories (can be purchased separately)
Mini DB9F-to-TB: DB9 female to terminal block connector
CBL-USBA/B-100: USB Type A to USB Type B cable, 100 cm
CBL-F9M9-150: DB9 female to DB9 male serial cable, 150 cm
CBL-F9M9-20: DB9 female to DB9 males serial cable, 20 cm
CBL-RJ45SF9-150: RJ45 to DB9 female shielded serial cable, 150 cm
ADP-RJ458P-DB9: DB9 female to RJ45 connector
A-ADP-RJ458P-DB9F-ABC01: DB9 female to RJ45 connector
DK-UP1400: DIN-rail/wall- mounting kit that includes 2 wall-mounting plates with 6 screws (WK-35-01), and 2 DIN-rail plates with 4 screws (DK35A)
DIN-Rail Kit: DIN-rail kit with 2 screws (P/N: 1490000150011)
Note: One power cord suitable for your region is included in the product package. Additional power adapters and power cords can be purchased separately. Please refer to the Power Accessory Selection Guide for details.

Package Checklist
- 1 UPort 1600-8 USB-to-serial converter
- 1 serial adapter: Mini DB9F-to-TB (UPort 1650-8 only)
- USB cable: CBL-USBA/B-100
- 100 to 240 VAC power adapter suitable for your region (excluding T models)
- 1 power cord (suitable for your region)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

UPort® 1600-16 Series

16-port RS-232 and RS-232/422/485 USB-to-serial converters

- Hi-Speed USB 2.0 for up to 480 Mbps USB transmission
- 921.6 kbps maximum baudrate for super fast data transmission
- 15N high retention USB Type B connector
- 128-byte FIFO and on-chip H/W, S/W flow control
- Standard 19-inch rack-mountable
- COM port assignments maintained across different PCs
- Supports fixed-base COM Utility for setting the initial extended COM port number
- Mini DB9 female to terminal block adapter for easy wiring
- Drivers provided for Windows, WinCE, and Linux

Overview

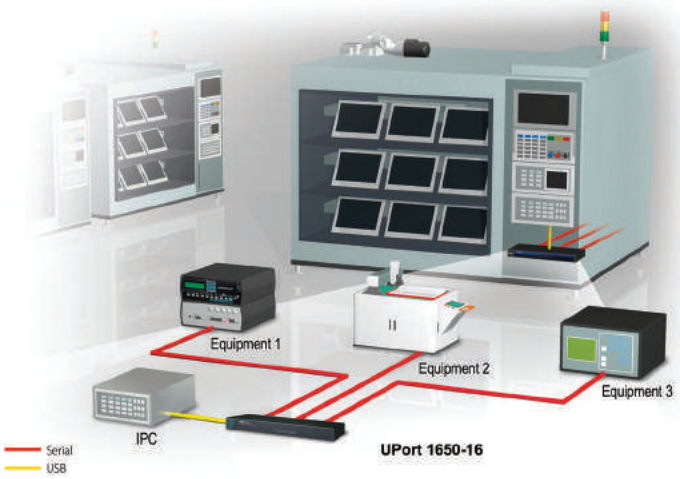
The UPort® 1600-16 USB-to-serial converters allow you to connect 16 RS-232 or RS-232/422/485 devices to your laptop or workstation through the USB (Universal Serial Bus) port. The UPort® 1600-16 converters are compatible with new and legacy serial devices, and they are perfect for instrumentation and manufacturing applications.

Typical Application—TFT-LCD Manufacturing

Manufacturing TFT-LCD (thin-film transistor liquid crystal display) panels is a complicated and highly technical process. The three major stages in TFT-LCD panel production are the array, LC cell, and module assembly processes. In addition, each finished panel must also pass a series of quality inspection tests, which include defect inspection and lighting tests. The most challenging part of the TFT-LCD manufacturing process is achieving zero fault tolerance for high quality and productivity. One of our customers needed a USB-to-serial solution to transmit data between a host and quality inspection equipment in the TFT-LCD manufacturing process. In such a demanding manufacturing environment, adopting multiple ports and Moxa's ruggedly designed UPort® 1650-16 USB-to-serial converter proved to be the best option.

The UPort® 1650-16 has the following features:

- Standard 19-inch rackmount size and metal housing for industrial-grade requirements
- Up to 16 ports for easy USB-to-serial expansion
- 3-in-1 serial ports for a cost-effective solution
- True USB 2.0 Hi-Speed transmission for greater productivity
- 128-byte FIFO and on-chip hardware and software flow control to ensure stable data transmission during inspection
- Each serial port has its own LED indicator for easy troubleshooting



Specifications

USB Interface
Compliance: USB 1.1/2.0 compliant
Connector: USB Type B
Speed: 480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)

Serial Interface
Number of Ports: 16
Serial Standards:
UPort 1610-16: RS-232
UPort 1650-16: RS-232/422/485
Connector: DB9 male

Performance
Baudrate: 50 bps to 921.6 kbps (including 500 kbps)

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
FIFO: 128 bytes

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND
RS-485 Data Direction: ADDC® (Automatic Data Direction Control)

Operating Systems
Windows Real COM Drivers: Windows 2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2012 (x64), Windows Embedded CE 5.0/6.0
Linux Real TTY Drivers: Linux 2.4.x, 2.6.x, 3.x
Android Driver: Android 3.1.x and later
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Housing: SECC sheet metal (1 mm)
Weight:
Product only: 2475 g (5.45 lb)
Packaged: 3485 g (7.68 lb)
Dimensions: 440 x 45.5 x 198.1 mm (17.32 x 1.79 x 7.80 in)

Environmental Limits
Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 75°C (-4 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

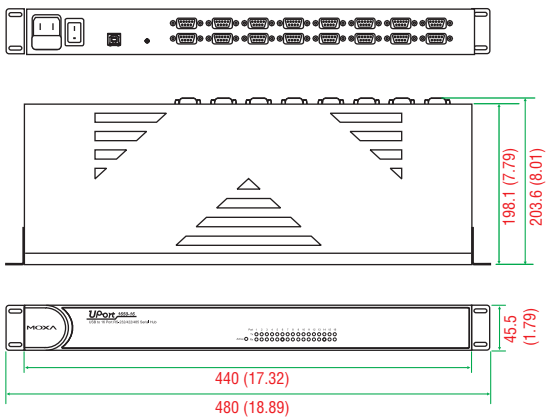
Standards and Certifications
Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV
IEC 61000-4-5 Surge: Power: 1 kV;
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m
IEC 61000-4-8 PFMF
Green Product: RoHS, CRoHS, WEEE

Power Requirements
Input Voltage: 100 to 240 VAC
Input Current: 220 mA @ 100 VAC

MTBF (mean time between failures)
Time:
UPort 1610-16: 138,704 hrs
UPort 1650-16: 120,001 hrs
MIL-HDBK-217F

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions
Unit: mm (inch)



Ordering Information

Available Models
UPort 1610-16: 16-port RS-232 USB-to-serial converter
UPort 1650-16: 16-port RS-232/422/485 USB-to-serial converter

Optional Accessories (can be purchased separately)
Mini DB9F-to-TB: DB9 female to terminal block connector
CBL-USBA/B-100: USB Type A to USB Type B cable, 100 cm
CBL-F9M9-150: DB9 female to DB9 male serial cable, 150 cm
CBL-F9M9-20: DB9 female to DB9 males serial cable, 20 cm
CBL-RJ45SF9-150: RJ45 to DB9 female shielded serial cable, 150 cm
ADP-RJ458P-DB9: DB9 female to RJ45 connector
A-ADP-RJ458P-DB9F-ABC01: DB9 female to RJ45 connector
WK-44-01: Rack-mounting kit: 2 L-shaped plates with 8 screws
Note: One power cord suitable for your region is included in the product package. Additional power adapters and power cords can be purchased separately. Please refer to the Power Accessory Selection Guide for details.

Package Checklist
- 1 UPort 1600-16 USB-to-serial converter
- USB cable: CBL-USBA/B-100
- 100 to 240 VAC power adapter (excluding T models)
- 1 power cord suitable for your region
- 1 serial adapter: mini DB9F-to-TB (UPort 1650-16 only)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

UPort® 2210/2410

2 and 4-port RS-232 USB-to-serial converters

- Hi-Speed USB 2.0 for up to 480 Mbps USB transmission
- 921.6 kbps maximum baudrate for super fast data transmission
- Drivers provided for Windows and Linux
- Supports fixed-base COM Utility for setting the initial extended COM port number
- LEDs for easy monitoring

Overview

The UPort® 2210/2410 USB-to-serial converters allow you to connect 2 or 4 RS-232 devices to your laptop or workstation through the USB (Universal Serial Bus) port. The UPort® 2210 and UPort® 2410 are cost-effective solutions for both new and legacy RS-232 devices, and they are perfect for mobile, instrumentation, and point-of sale applications.

Specifications

USB Interface

Compliance: USB 1.1/2.0 compliant
Connector: USB Type B
Speed: 480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)

Serial Interface

Number of Ports:
UPort 2210: 2
UPort 2410: 4
Serial Standards: RS-232
Connector: DB9 male

Performance

Baudrate: 50 bps to 921.6 kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Mark, Space
Flow Control: RTS/CTS, XON/XOFF
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS
FIFO: 16 bytes

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Operating Systems

Windows Real COM Drivers: Windows 2000, Windows XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows 2012 (x64)
Mac Driver: Mac OS X
Linux Real TTY Drivers: Linux 2.4.x, 2.6.x, 3.x
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics

Housing: Polycarbonate (PC)
Weight:
Product only:
UPort 2210: 120 g (0.26 lb)
UPort 2410: 210 g (0.46 lb)
Packaged:
UPort 2210: 325 g (0.72 lb)
UPort 2410: 455 g (1 lb)
Dimensions:
UPort 2210: 70 x 35 x 120 mm (2.76 x 1.38 x 4.72 in)
UPort 2410: 80 x 35 x 185 mm (3.15 x 1.38 x 7.28 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 75°C (-4 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 4 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV
IEC 61000-4-5 Surge: Power: 1 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m
IEC 61000-4-8 PFMF
Green Product: RoHS, CRoHS, WEEE

Power Requirements

Input Voltage: 5 VDC
Input Current: UPort 2210: 140 mA @ 5 VDC
UPort 2410: 240 mA @ 5 VDC

MTBF (mean time between failures)

Time:
UPort 2210: 4,221,778 hrs
UPort 2410: 3,901,775 hrs
Standard: Telcordia (Bellcore), GB

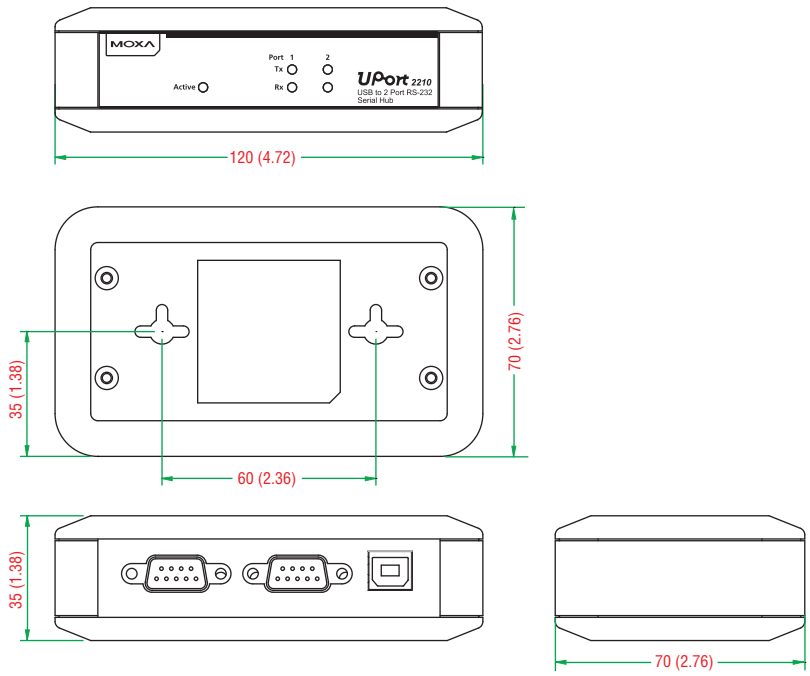
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

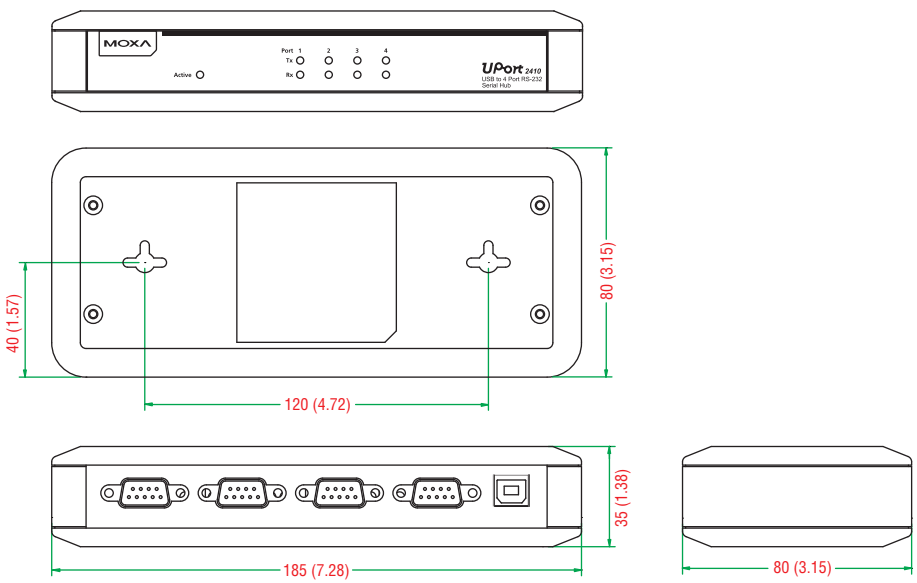
Dimensions

Unit: mm (inch)

UPort® 2210



UPort® 2410



Ordering Information

Available Models

UPort 2210: 2-port RS-232 USB-to-serial converter
UPort 2410: 4-port RS-232 USB-to-serial converter

Optional Accessories (can be purchased separately)

CBL-USBA/B-100: USB Type A to USB Type B cable, 100 cm

Package Checklist

- 1 UPort 2210 or UPort 2410 USB-to-serial converter
- USB cable: CBL-USBA/B-100
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

UPort® 404/407

4 and 7-port industrial-grade USB hubs

- Hi-Speed USB 2.0 for up to 480 Mbps USB transmission
- USB-IF certification
- Dual power inputs (power jack and terminal block)
- 15 kV ESD Level 4 protection for all USB ports
- Rugged metal housing
- DIN-Rail and wall mountable
- Comprehensive diagnostic LEDs
- Choose bus power or external power (UPort 404)

Introduction

The UPort® 404 and UPort® 407 are industrial-grade USB 2.0 hubs that expand 1 USB port into 4 and 7 USB ports, respectively. The hubs are designed to provide true USB 2.0 Hi-Speed 480 Mbps data transmission through each port, even for heavy-load applications. The UPort® 404/407 have received USB-IF Hi-Speed certification, which is an indication that both products are reliable, high-quality USB 2.0 hubs.In addition, the hubs are fully compliant with the USB Plug & Play spec and provide a full 500 mA of power per port, ensuring that your USB devices will function properly. The UPort® 404/407 hubs' support of 12-40 VDC power makes them ideal for mobile applications. Externally powered USB hubs are the only way to guarantee the broadest compatibility with USB devices.

USB-IF Certification

The UPort® 404 and UPort® 407 USB 2.0 industrial-grade USB hubs have passed USB-IF (USB Implementers Forum) certification. USB-IF verifies a number of strict electrical requirements for the high-speed USB operation of USB hubs designed to the USB 2.0 specification. This means that the UPort® 404/407 support Hi-Speed USB 2.0 for up to 480 Mbps USB transmission, which is fully compliant with interoperability requirements, has enough power for devices to function, and provides for a successful transition back to high-speed operation from the suspend state.

ESD Level 4 Protection

Electrostatic discharge (ESD) could be as severe as having more than 1,000 volts of ESD with a high rise-time (dv/dt) break through the junction layer of protective devices. In order to avoid serious damage, Moxa's UPort® 404/407 USB hubs provide ESD level 4 (contact 8 kV, air 15 kV) protection, which increases the quality and value of the user's end-product.

Specifications

USB Interface

Compliance: USB 1.1/2.0 compliant
Upstream: 1 USB port, Type B connector
Downstream:
UPort 404: 4 USB ports, Type A connectors
UPort 407: 7 USB ports, Type A connectors
Speed: 480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)
Supply Current: 500 mA max. per channel

Physical Characteristics

Housing: Aluminum
Weight: Product only:
UPort 404: 850 g (1.87 lb)
UPort 407: 950 g (2.1 lb)
Packaged:
UPort 404: 855 g (1.88 lb)
UPort 407: 965 g (2.13 lb)
Dimensions:
UPort 404: 80 x 35 x 130 mm (3.15 x 1.38 x 5.12 in)
UPort 407: 100 x 35 x 192 mm (3.94 x 1.38 x 7.55 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temperature Models: -40 to 85°C (-40 to 185°F)
Storage Temperature:
Standard Models: -20 to 75°C (-4 to 167°F)
Wide Temperature Models: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24, EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV
IEC 61000-4-5 Surge: Power: 1 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m
IEC 61000-4-8 PFMF
Green Product: RoHS, CRoHS, WEEE

Power Requirements

Input Voltage: 12 to 40 VDC
Input Current: UPort 404: 1.3 A @ 12 VDC
UPort 407: 2.3 A @ 12 VDC

MTBF (mean time between failures)

Time:
UPort 404: 1,490,340 hrs
UPort 407: 1,111,361 hrs
Standard: Telcordia (Bellcore), GB

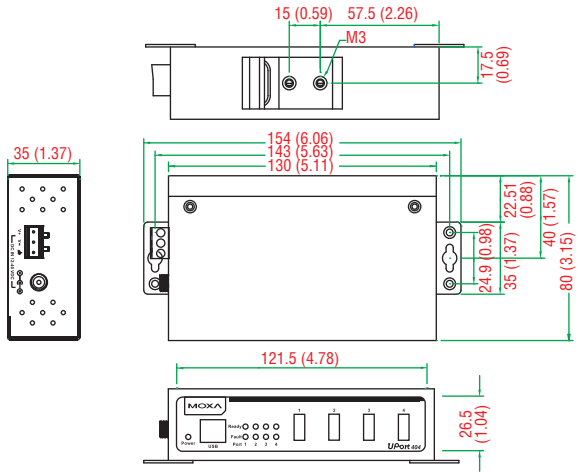
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

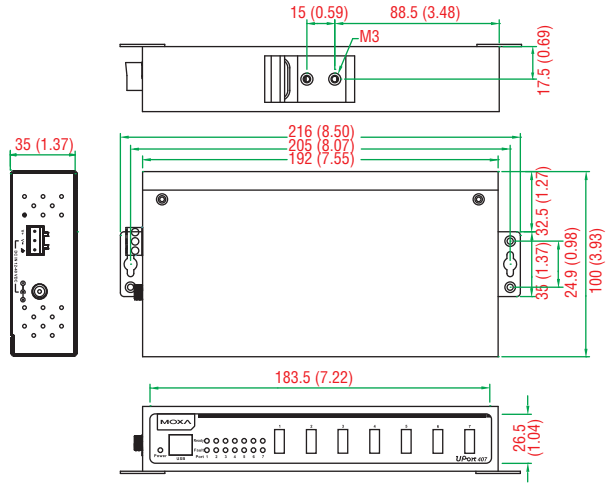
Dimensions

Unit: mm (inch)

UPort® 404



UPort® 407



Ordering Information

Available Models

UPort 404: 4-port industrial USB hub, adapter included, 0 to 60°C operating temperature
UPort 407: 7-port industrial USB hub, adapter included, 0 to 60°C operating temperature
UPort 404-T: 4-port industrial USB hub, -40 to 85°C operating temperature
UPort 407-T: 7-port industrial USB hub, -40 to 85°C operating temperature

Optional Accessories (can be purchased separately)

CBL-USBA/B-100: USB Type A to USB Type B cable, 100 cm
WK-35-02: 2 plates with 6 screws
DK-25-01: 1 DIN-rail kit; 25 x 48.3 mm with 2 screws
Note: One power adapter suitable for your region is included in the product package. Additional power adapters can be purchased separately. Please refer to the Power Accessory Selection Guide for details.

Package Checklist

- 1 UPort 404 or UPort 407 industrial-grade USB hub
- 100 to 240 VAC power adapter suitable for your region (excluding T models)
- USB Cable: CBL-USBA/B-100
- Wall-mounting kit: WK-35-02
- Quick installation guide (printed)
- Warranty card

UPort® 204/207

4 and 7-port entry-level USB hubs

- Hi-Speed USB 2.0 for up to 480 Mbps of USB transmission
- USB-IF certification
- 15 kV ESD Level 4 protection for all USB ports
- Comprehensive diagnostic LEDs
- Full 500 mA of power per port
- Choose bus power or external power (UPort 204 only)

Introduction

The UPort® 204 and UPort® 207 are entry-level USB 2.0 hubs that expand 1 USB port into 4 and 7 USB ports, respectively. The hubs are designed to provide true USB 2.0 Hi-Speed 480 Mbps data transmission through each port, even for heavy-load applications. The UPort® 204/207 have received USB-IF Hi-Speed certification and are fully Plug & Play. 500 mA of power per port ensures that your USB devices will function properly, and using 12 to 40 VDC of power makes them ideal for mobile applications. Externally USB hubs provide a broad USB device compatibility.

USB-IF Certification

The UPort® 204/207 USB 2.0 entry-level USB hubs are USB-IF (USB Implementers Forum) certified. USB-IF verifies a number of strict electrical requirements for the Hi-Speed USB operation of USB hubs designed to the USB 2.0 specification. This means that the UPort® 204/207 support Hi-Speed USB 2.0 for up to 480 Mbps USB transmission, which is compliant with interoperability requirements, has enough power for devices to function, and provides for a successful transition back to high-speed operation from the suspend state.

ESD Level 4 Protection

Electrostatic discharge (ESD) could be as severe as having more than 1,000 volts of ESD with a high rise-time (dv/dt) break through the junction layer of protective devices. In order to avoid serious damage, Moxa's UPort® 204/207 USB hubs provide ESD level 4 (contact 8 kV, air 15 kV) protection, which increases the quality and value of the user's end-product.

Specifications

USB Interface

Compliance: USB 1.1/2.0 compliant
Upstream: 1 USB port (Type B connector)
Downstream:
UPort 204: 4 USB ports, Type A connectors
UPort 207: 7 USB ports, Type A connectors
Speed: 480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)
Supply Current: 500 mA max. per channel

Physical Characteristics

Housing: Polycarbonate (PC)
Weight: Product only:
UPort 204: 800 g (1.76 lb)
UPort 207: 875 g (1.93 lb)
Packaged:
UPort 204: 805 g (1.87 lb)
UPort 207: 890 g (1.96 lb)
Dimensions:
UPort 204: 70 x 35 x 120 mm (2.76 x 1.38 x 4.72 in)
UPort 207: 80 x 35 x 185 mm (3.15 x 1.38 x 4.72 in)

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -20 to 75°C (-4 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24, EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV
IEC 61000-4-5 Surge: Power: 1 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m
IEC 61000-4-8 PFMF
Green Product: RoHS, CRoHS, WEEE

Power Requirements

Input Voltage: 12 to 40 VDC
Input Current: UPort 204: 1.21 A @ 12 VDC
UPort 207: 2.17 A @ 12 VDC

MTBF (mean time between failures)

Time:
UPort 204: 1,577,573 hrs
UPort 207: 1,059,201 hrs
Standard: Telcordia (Bellcore), GB

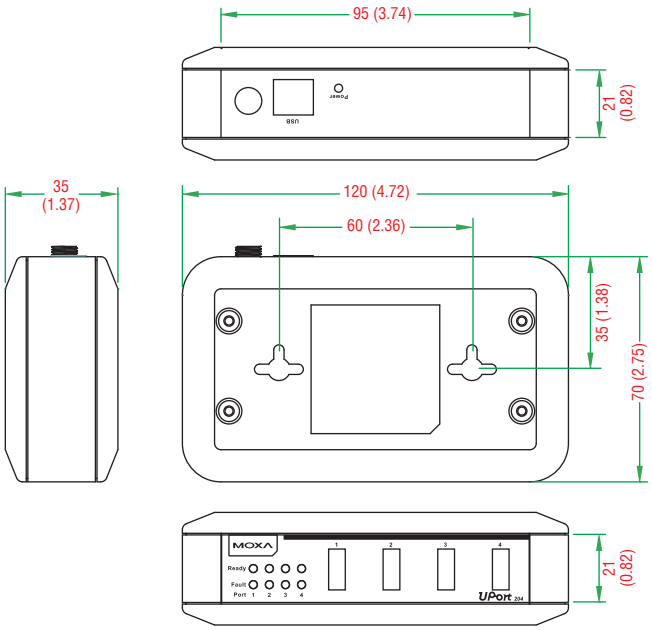
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

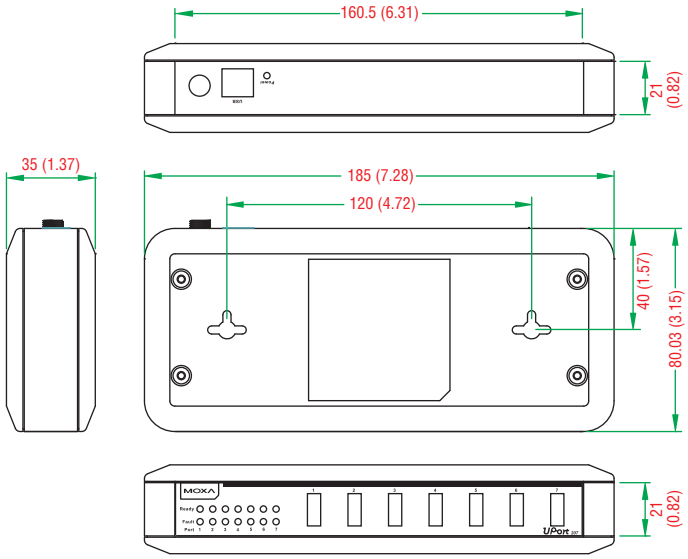
Dimensions

Unit: mm (inch)

UPort® 204



UPort® 207



Ordering Information

Available Models

UPort 204: 4-port entry-level USB hub, adapter included
UPort 207: 7-port entry-level USB hub, adapter included

Optional Accessories (can be purchased separately)

CBL-USBA/B-100: USB Type A to USB Type B cable, 100 cm

Note: One power adapter suitable for your region is included in the product package. Additional power adapters can be purchased separately. Please refer to the Power Accessory Selection Guide for details.

Package Checklist

- 1 UPort 204 or UPort 207 entry-level USB hub
- USB cable: CBL-USBA/B-100
- 100 to 240 VAC power adapter suitable for your region (excluding T models)
- Quick installation guide (printed)
- Warranty card

Power Accessory Selection Guide

Barrel Plug Type		Non-locking barrel plug	Locking barrel plug				
O/P		12 VDC, 1.5 A, 100 to 240 VAC	12 VDC, 3 A 100 to 240 VAC (Switch Mode)				
Plug Type		CN	US/JP	EU	AU	UK	CN
Model Name		PWR-12150-CN-S2	PWR-12300-WPUSJP-S1	PWR-12300-WPEU-S1	PWR-12300-WPAU-S1	PWR-12300-WPUK-S1	PWR-12300-WPCN-S1
Appearance							
2 ports	UPort 1250	–	–	–	–	–	–
	UPort 1250I	✓	–	–	–	–	–
	UPort 2210	–	–	–	–	–	–
4 ports	UPort 1410	✓	–	–	–	–	–
	UPort 1450	✓	–	–	–	–	–
	UPort 1450I	✓	–	–	–	–	–
	UPort 2410	–	–	–	–	–	–
	UPort 204	–	✓	✓	✓	✓	✓
	UPort 404	–	✓	✓	✓	✓	✓
7 ports	UPort 207	–	✓	✓	✓	✓	✓
	UPort 407	–	✓	✓	✓	✓	✓
8 ports	UPort 1610-8	✓	–	–	–	–	–
	UPort 1650-8	✓	–	–	–	–	–
16 ports	UPort 1610-16	–	–	–	–	–	–
	UPort 1650-16	–	–	–	–	–	–

Barrel Plug Type		Locking barrel plug					
O/P		12 VDC 2 A, 100 to 240 VAC (desktop type)	2.5A/250 V Power Cord, 183 cm				
Plug Type		Must be used with a power cord	US	JP	EU	AU	UK
Model Name		PWR-12125-DT-S2	PWC-C7US-2B-183	PWC-C7JP-2B-183	PWC-C7EU-2B-183	PWC-C7AU-2B-183	PWC-C7UK-2B-183
Appearance							
2 ports	UPort 1250	✓	✓	✓	✓	✓	✓
	UPort 1250I	✓	✓	✓	✓	✓	✓
	UPort 2210	–	–	–	–	–	–
4 ports	UPort 1410	✓	✓	✓	✓	✓	✓
	UPort 1450	✓	✓	✓	✓	✓	✓
	UPort 1450I	✓	✓	✓	✓	✓	✓
	UPort 2410	–	–	–	–	–	–
	UPort 204	–	–	–	–	–	–
	UPort 404	–	–	–	–	–	–
7 ports	UPort 207	–	–	–	–	–	–
	UPort 407	–	–	–	–	–	–
8 ports	UPort 1610-8	✓	✓	✓	✓	✓	✓
	UPort 1650-8	✓	✓	✓	✓	✓	✓
16 ports	UPort 1610-16	✓	✓	✓	✓	✓	✓
	UPort 1650-16	✓	✓	✓	✓	✓	✓

Serial Media Converters

Product Selection Guide

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Serial-to-Fiber Media Converters 14-3
Serial Converters and Repeaters 14-4
Serial Surge Protector 14-5
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Chassis Media Converters

TRC-190 Series: Rackmount chassis for the NRack System™ 14-7
TCF-142-RM Series: RS-232/422/485 to fiber slide-in modules for the NRack System™ 14-9

Serial-to-Fiber Media Converters

ICF-1150 Series: Industrial RS-232/422/485 to fiber converters 14-11
TCF-142 Series: RS-232/422/485 to fiber converters 14-14
TCF-90 Series: Port-powered RS-232 to fiber converters 14-17

Serial Converters and Repeaters

TCC-100/100I Series: Industrial RS-232 to RS-422/485 converters with optional 2 kV isolation 14-19
TCC-80/80I Series: Port-powered RS-232 to RS-422/485 converters with optional 2.5 kV isolation 14-20
TCC-120/120I: Industrial RS-422/485 converters/repeaters with optional 2 kV isolation 14-23
TCC-82: Port-powered RS-232 4-channel isolator with 4 kV isolation 14-24

Serial Surge Protector

ISD-1100-T/1200-T Series: Data line surge protectors 14-26

CAN-to-Fiber Converters

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ICF-1170I Series: Industrial CAN-to-fiber converters 14-30

PROFIBUS-to-Fiber Converters

ICF-1180I/1280I Series: Industrial PROFIBUS-to-fiber converters with redundant fiber ring 14-32

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Serial Media Converters

Chassis Media Converters

	TRC-190-AC TRC-190-DC-48	TCF-142-M-SC-RM TCF-142-M-ST-RM	TCF-142-S-SC-RM TCF-142-S-ST-RM
Optical-Fiber Side			
Fiber Connector	–	SC or ST	
Cable Requirements	–	50/125, 62.5/125, or 100/140 µm	8.3/125, 8.7/125, 9/125, or 10/125 µm
Transmission Distance	–	5 km	40 km
Wavelength	–	850 nm	1310 nm
Tx Output	–	> -5 dBm	
Rx Sensitivity	–	-20 dBm	-25 dBm
Point-to-Point Transmission	–	Point-to-Point Transmission: Half-duplex or full-duplex	
RS-232/422/485 Side			
Connector	–	DB9	
RS-232 Signals	–	TxD, RxD, GND	
RS-422 Signals	–	TxD+, TxD-, RxD+, RxD-, GND	
RS-485-4w Signals	–	TxD+, TxD-, RxD+, RxD-, GND	
RS-485-2w Signals	–	Data+, Data-, GND	
Baudrate	–	50 bps to 921.6 kbps	
Physical Characteristics			
Housing	SECC (1.2 mm)	–	
Dimensions	440 x 260 x 77 mm (18.6 x 11 x 3.3 in)	86.8 x 136.5 x 21 mm (3.42 x 5.37 x 0.83 in)	
Weight	5.2 kg (11.4 lb), with one power module installed	105 g (0.23 lb)	
Number of Slots	19 slots in the front for slide-in modules, 2 slots in the back for power supply modules	–	
Environmental Limits			
Operating Temperature	0 to 60°C (32 to 140°F)		
Ambient Relative Humidity	5 to 95% (non-condensing)		
Storage Temperature	-25 to 75°C (-4 to 167°F)		
Power Requirements			
Input Voltage	100 to 240 VAC or 36 to 72 VDC	12 VDC	
Input Current	3.2 mA @ 36 VDC	150 mA @ 12 VDC	
Standards and Certifications			
Safety	UL 60950-1		
EMC	EN 55022/24		
EMI	CISPR 22, FCC Part 15B Class A		
EMS	EN 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m EN 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV EN 61000-4-5 Surge: Power: 1 kV; Signal: 0.5 kV EN 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m EN 61000-4-8 PFMF EN 61000-4-11 DIPS		
Freefall	–	IEC 60068-2-32	
Green Product	RoHS, CRoHS, WEEE		
Reliability			
MTBF	Time: 959,780 hrs Standard: MIL-HDBK-217F		
Warranty	5 years (see www.moxa.com/warranty)		
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Serial-to-Fiber Media Converters

	ICF-1150-M-SC/ST ICF-1150-M-SC/ST-T	ICF-1150I-M-SC/ST ICF-1150I-M-SC/ST-T	ICF-1150-S-SC/ST ICF-1150-S-SC/ST-T	ICF-1150I-S-SC/ST ICF-1150I-S-SC/ST-T	TCF-142-M-SC/ST TCF-142-M-SC/ST-T	TCF-142-S-SC/ST TCF-142-S-SC/ST-T	TCF-90-M/S
Optical-Fiber Side							
Fiber Connector	SC or ST						ST
Cable Requirements	Single-mode: 8.3/125, 8.7/125, 9/125, or 10/125 µm Multi-mode: 50/125, 62.5/125, or 100/140 µm						
Transmission Distance	Single-mode: 40 km Multi-mode: 5 km						
Wavelength	Single-mode: 1310 nm Multi-mode: 850 nm						
Tx Output	Single-mode: > -5 dBm Multi-mode: > -5 dBm						
Rx Sensitivity	Single-mode: -25 dBm Multi-mode: -20 dBm						
Point-to-Point Transmission	Half-duplex or full-duplex						–
Multidrop Transmission	Half-duplex, fiber ring						–
RS-232 Side							
Connector	DB9 female				Terminal block		DB9 female
Signals	Tx, Rx, GND						TxD, RxD, GND (Loop-back wiring: RTS to CTS, DTR to DSR and DCD)
Baudrate	50 bps to 921.6 kbps						300 bps to 115.2 kbps
RS-232/422/485 Side							
Connector	Terminal Block						–
RS-232 Signals	TxD, RxD, GND						
RS-422 Signals	TxD+, TxD-, RxD+, RxD-, GND						–
RS-485-4w Signals	TxD+, TxD-, RxD+, RxD-, GND						–
RS-485-2w Signals	Data+, Data-, GND						–
Baudrate	50 bps to 921.6 kbps						–
Isolation	–	2 kV	–	2 kV	–	–	–
Physical Characteristics							
Housing	Metal						ABS + PC
Weight	330 g (0.73 lb)	330 g (0.73 lb)	330 g (0.73 lb)	330 g (0.73 lb)	320 g (0.71 lb)	320 g (0.71 lb)	150 g (0.33 lb)
Dimensions	30.3 x 70 x 115 mm (1.19 x 2.76 x 4.53 in)				67 x 100 x 22 mm (2.64 x 3.94 x 0.87 in)		42 x 80 x 22 mm (1.65 x 3.15 x 0.87 in)
Environmental Limits							
Operating Temperature	Standard Temperature: 0 to 60°C (32 to 140°F) Wide Temperature: -40 to 85°C (-40 to 185°F)				Standard Temperature: 0 to 60°C (32 to 140°F) Wide Temperature: -40 to 85°C (-40 to 167°F)		0 to 60°C (32 to 140°F)
Ambient Relative Humidity	5 to 95% (non-condensing)						
Storage Temperature	-40 to 85°C (-40 to 185°F)						-20 to 75°C (-4 to 167°F)
Power Requirements							
Source of Input Power	–	–	–	–	–	–	RS-232 port (TxD, RTS, DTR) or power input jack
Input Voltage	12 to 48 VDC						5 to 12 VDC
Input Current	127 mA @ 12 VDC	163 mA @ 12 VDC	127 mA @ 12 VDC	163 mA @ 12 VDC	140 mA @ 12 VDC		20 mA @ 12 VDC
Voltage Reversal Protection	Protects against V+/V- reversal						–
Overcurrent Protection	1.1 A				1.1 A		–
Standards and Certifications							
Safety	UL 508				UL 60950-1		UL 60950-1
Hazardous Location	Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2 EEx nC IIC, IECEx				–	–	–
EMC	EN 55022/24						
EMI	CISPR 22, FCC Part 15B Class A						CISPR 22, FCC Part 15B Class A
EMS	EN 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m EN 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV EN 61000-4-5 Surge: Power: 4 kV; Signal: 0.5 kV EN 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m EN 61000-4-8 PFMF				EN 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m EN 61000-4-4 EFT: Power: 1 kV EN 61000-4-5 Surge: Power: 1 kV EN 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m EN 61000-4-8 PFMF		EN 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m EN 61000-4-4 EFT: Power: 0.5 kV; Signal: 1 kV EN 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV EN 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m EN 61000-4-8 PFMF
Freefall	IEC 60068-2-32				–	–	–
Green Product	RoHS, CRoHS, WEEE				RoHS, CRoHS, WEEE		RoHS, CRoHS, WEEE
Reliability							
MTBF	Time: 792,085 hrs Standard: Telcordia (Bellcore), GB				Time: 780,480 hrs Standard: Telcordia (Bellcore), GB		Time: 2,272,562 hrs Standard: MIL-HDBK-217F
Warranty	5 years (see www.moxa.com/warranty)						
Page	14-11	14-11	14-11	14-11	14-14	14-14	14-17

Serial Converters and Repeaters

	TCC-100 TCC-100-T	TCC-100I TCC-100I-T	TCC-80	TCC-80I	TCC-120	TCC-120I	TCC-82
RS-232 Side							
Connector	DB9 female		DB9 female		–	–	DB9 male/female
Signals	TxD, RxD, RTS, CTS, GND (Loop-back wiring: DTR to DSR and DCD)		TxD, RxD, GND (Loop-back wiring: RTS to CTS, DTR to DSR and DCD)		–	–	TxD, RxD, RTS, CTS, GND (Loop-back wiring: DTR to DSR and DCD)
RS-422/485 Side							
Connector	Terminal Block		Terminal Block or DB9 male		Terminal block on both ends		–
Signals	(interface selected by DIP switch) RS-422: TxD+, TxD-, RxD+, RxD-, GND RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND RS-485-2w: Data+, Data-, GND		(interface selected by DIP switch) RS-422: TxD+, TxD-, RxD+, RxD-, GND RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND RS-485-2w: Data+, Data-, GND		(interface selected by DIP switch) RS-422: TxD+, TxD-, RxD+, RxD-, GND RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND RS-485-2w: Data+, Data-, GND		–
RS-485 Data Direction Control	ADDC®		ADDC®		ADDC®		–
Serial Communication							
Baudrate	50 bps to 921.6 kbps		50 bps to 115.2 kbps		50 bps to 921.6 kbps		50 bps to 115.2 kbps
Pull High Resistance	1k/150k ohm		1k ohm	4.7k ohm	1k/150k ohm		–
Pull Low Resistance	1k/150k ohm		1k ohm	4.7k ohm	1k/150k ohm		–
Optical Isolation	–	2 kV	–	2.5 kV	–	2 kV	4 kV
Physical Characteristics							
Housing	Metal		ABS + PC		Metal		ABS
Dimensions	67 x 100.4 x 22 mm (2.64 x 3.93 x 0.87 in)		42 x 80 x 22 mm (1.65 x 3.15 x 0.87 in)		67 x 100.4 x 22 mm (2.64 x 3.93 x 0.87 in)		42 x 80 x 23.6 mm (1.65 x 3.15 x 0.93 in)
Weight	148 g (0.325 lb)		50 g (0.11 lb)		148 g (0.325 lb)		60 g (0.132 lb)
Environmental Limits							
Operating Temperature	Standard Temperature: -20 to 60°C (-4 to 140°F) Wide Temperature: -40 to 85°C (-40 to 185°F)		0 to 60°C (32 to 140°F)		-20 to 60°C (4 to 140°F)		0 to 60°C (32 to 140°F)
Ambient Relative Humidity	5 to 95% (non-condensing)						
Storage Temperature	-40 to 85°C (-40 to 185°F)		-20 to 75°C (-4 to 167°F)		-20 to 75°C (-4 to 167°F)		-20 to 75°C (-4 to 167°F)
Power Requirements							
Source of Input Power	Power input jack		RS-232 port (TxD, RTS, DTR) or power input jack		Power input jack		RS-232 port (TxD, RTS, DTR) or power input jack
Input Voltage	12 to 48 VDC		5 to 12 VDC		12 to 48 VDC		5 to 12 VDC
Input Current	85 mA @ 12 VDC	150 mA @ 12 VDC	10 mA @ 5 VDC	20 mA @ 5 VDC	65 mA @ 12 VDC	180 mA @ 12 VDC	20 mA @ 5 VDC
Voltage Reversal Protection	Protects against V+/V- reversal		–	–	Protects against V+/V- reversal		–
Overcurrent Protection	✓	✓	–	–	✓	✓	–
Standards and Certifications							
Safety	UL 60950-1						
EMC	EN 55022/24						
EMI	CISPR 22, FCC Part 15B Class B						
EMS	EN 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m EN 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV EN 61000-4-5 Surge: Power: 1 kV EN 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m EN 61000-4-8 PFMF		EN 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m EN 61000-4-4 EFT: Power: 1 kV EN 61000-4-5 Surge: Power: 1 kV EN 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m EN 61000-4-8 PFMF		EN 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m EN 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV EN 61000-4-5 Surge: Power: 1 kV EN 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m EN 61000-4-8 PFMF		EN 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m EN 61000-4-4 EFT: Power: 0.5 kV EN 61000-4-5 Surge: Power: 1 kV EN 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m EN 61000-4-8 PFMF
Green Product	RoHS, CRoHS, WEEE						
Reliability							
MTBF	Time: 3,017,857 hrs Standard: MIL-HDBK-217F		Time: 2,781,161 hrs Standard: Telcordia (Bellcore), GB		Time: 1,949,025 hrs Standard: Telcordia (Bellcore), GB		Time: 959,780 hrs Standard: MIL-HDBK-217F
Warranty	5 years (see www.moxa.com/warranty)						
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Serial Surge Protector

	ISD-1110-T	ISD-1130-T	ISD-1210-T	ISD-1230-T
Data Line Surge Protection				
Interface	RS-232	RS-422/485	RS-232	RS-422/485
Maximum Power Protection	400 watts		5000 watts	
Number of Protected Lines	7	4		
Surge Capacity	4 kV, 8/20 μs impulse per line		20 kV, 8/20 μs impulse per line	
Working Voltage	15 V	5 V	15 V	5 V
Maximum Load Current	0.1 A (23°C), 0.05 A (85°C)	0.12 A (23°C), 0.07 A (85°C)	0.4 A (20°C), 0.13 A (85°C)	0.4 A (20°C), 0.13 A (85°C)
Response Time	< 1 ns			
Bandwidth	10 MHz loss < 1 dB			
Connector				
Connector	Data in: DB9 male Data out: DB9 female	Data in: Terminal Block Data out: Terminal Block		
Physical Characteristics				
Housing	Plastic (IP30)		Metal (IP30)	
Weight	58 g (0.13 lb)	30 g (0.07 lb)	214 g (0.48 lb)	212 g (0.47 lb)
Dimension	53 x 37 x 20.6 mm (2.01 x 1.46 x 0.81 in)		95 x 53 x 25 mm (3.74 x 2.01 x 0.98 in)	
Environmental Limits				
Operating Temperature	-40 to 85°C (-40 to 185°F)			
Ambient Relative Humidity	-40 to 85°C (-40 to 185°F)			
Operating Humidity	5 to 95% (non-condensing)			
Standards and Certifications				
EMS	EN 61000-4-5 Surge: Signal 4 kV		IEC 61643-21 C2: 20 kV 1.2/50, 10 kA 8/20	
Reliability				
Warranty	5 years (limited to 1-time use) (see www.moxa.com/warranty) Note: ISD products will only be repaired once within 5 years of purchase. After the first repair, the product's warranty will no longer be valid.			
MTBF	Time: 862,859 hrs Standard: Telcordia (Bellcore), GB		Time: 964,269 hrs Standard: Telcordia (Bellcore), GB	
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CAN-to-Fiber, PROFIBUS-to-Fiber Converters

	ICF-1170I-M-ST ICF-1170I-M-ST-T	ICF-1180I-M-ST/ST-T ICF-1180I-S-ST/ST-T	ICF-1280I-M-ST/ST-T ICF-1280I-S-ST/ST-T
Optical Fiber Side			
Fiber Connector	ST		
Cable Requirements	Multi-mode: 50/125, 62.5/125, or 100/140 µm		
Transmission Distance	Up to 2 km	Multi-mode: 4 km Single-mode: 45 km	Multi-mode: 4 km Single-mode: 45 km
Wavelength	Multi-mode: 850 nm	Multi-mode: 820 nm Single-mode: 1310 nm	Multi-mode: 820 nm Single-mode: 1310 nm
Tx Output	Multi-mode: > -5 dBm	Multi-mode: > -14 dBm Single-mode: > -7 dBm	Multi-mode: > -14 dBm Single-mode: > -7 dBm
Rx Sensitivity	Multi-mode: -20 dBm	Multi-mode: -28 dBm Single-mode: -29 dBm	Multi-mode: -28 dBm Single-mode: -29 dBm
Fieldbus Interface			
Connector	3-pin removable screw terminal	DB9 female	DB9 female
Specification	CAN 2.0A and 2.0B (ISO 11898-2)	PROFIBUS DP (IEC 61158-2)	PROFIBUS DP (IEC 61158-2)
Signal Support	CAN_H, CAN_L, CAN_GND	PROFIBUS D+, PROFIBUS D-, RTS, Signal common, 5 V	PROFIBUS D+, PROFIBUS D-, RTS, Signal common, 5 V
Optical Isolation	2 kV		
Transfer Rate	Up to 1 Mbps	Up to 12 Mbps	Up to 12 Mbps
Termination Resistors	120 ohms (selected by DIP switch)		
Physical Characteristics			
Housing	Metal		
Weight	178 g (0.39 lb)	164 g (0.36 lb)	308 g (0.68 lb)
Dimensions	30.3 x 115 x 70 mm (11.9 x 45.3 x 27.6 in)		39 x 115 x 70 mm (1.54 x 45.3 x 2.76 in)
Environmental Limits			
Operating Temperature – Standard Temperature	0 to 60°C (32 to 140°F)		
Operating Temperature – Wide Temperature	-40 to 85°C (-40 to 185°F)	-40 to 75°C (-40 to 167°F)	-40 to 75°C (-40 to 167°F)
Ambient Relative Humidity	5 to 95% (non-condensing)		
Storage Temperature	-40 to 85°C (-40 to 185°F)	-40 to 75°C (-40 to 167°F)	-40 to 75°C (-40 to 167°F)
Power Requirements			
Input Voltage	12 to 48 VDC dual power inputs for redundant power		
Input Current	221 mA @ 12 VDC	186 mA @ 12 VDC	315 mA @ 12 VDC
Voltage Reversal Protection	Protects against V+/V- reversal		
Over Current Protection	1.1 A (protects against two signals shorted together)		
Standards and Certifications			
Safety	UL 508, EN 60950-1	UL 508, EN 60950-1	UL 508, EN 60950-1
EMC	EN 55022/24		
EMI	CISPR 22, FCC Part 15B Class B A	CISPR 22, FCC Part 15B Class B A	CISPR 22, FCC Part 15B Class B A
EMS	EN 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m EN 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV EN 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV EN 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m EN 61000-4-8 PFMF	EN 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m EN 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV EN 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV EN 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m EN 61000-4-8 PFMF	EN 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m EN 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV EN 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV EN 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m EN 61000-4-8 PFM)
Freefall	IEC 60068-2-32	IEC 60068-2-32	IEC 60068-2-32
Green Product	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE
Reliability			
MTBF	Time: 792,085 hrs Standard: Telcordia (Bellcore), GB	Time: 1,870,854 hrs Standard: Telcordia (Bellcore), GB	Time: 1,567,875 hrs Standard: Telcordia (Bellcore), GB
Warranty	5 years (see www.moxa.com/warranty)		
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TRC-190 Series

Rackmount chassis for the NRack System™

- 19-inch chassis for rackmount use
- 19 slots for high-density applications
- Supports hot-swap and dual-power input with redundancy
- Fanless chassis design reduces servicing costs

Introduction

The TRC-190 series provides 19 slots for media converter modules from the CSM-200 series of Ethernet-to-fiber modules and the TCF-142-RM series of serial-to-fiber modules. A TRC-190 chassis comes with one AC or DC power input, with an optional redundant power expansion module available for greater reliability. The TRC-190 series' power input module supports the hot-swap feature.

Specifications

Physical Characteristics

Housing: SECC (1.2 mm)
Dimensions: 440 x 260 x 77 mm (18.6 x 11 x 3.3 in)
Weight: 5.2 kg (11.4 lb), with one power module installed
Number of Slots: 19 slots in the front for slide-in modules, 2 slots in the back for power supply modules

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -20 to 75°C (-4 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: Universal 100 to 240 VAC (47 to 63 Hz) or 36 to 72 VDC
Input Current: 3.2 A @ 36 VDC
Power Consumption: Max. Output: 3.2A @ 36 VDC

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
EN 61000-4-2 (ESD): Contact: 4 kV; Air: 8 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 3 V/m
EN 61000-4-4 (EFT): Power: 1 kV; Signal: 0.5 kV
EN 61000-4-5 (Surge): Power: 1 kV; Signal: 0.5 kV
EN 61000-4-6 (CS): 150 kHz to 80 MHz: 3 V/m
EN 61000-4-8 (PFMF)
EN 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

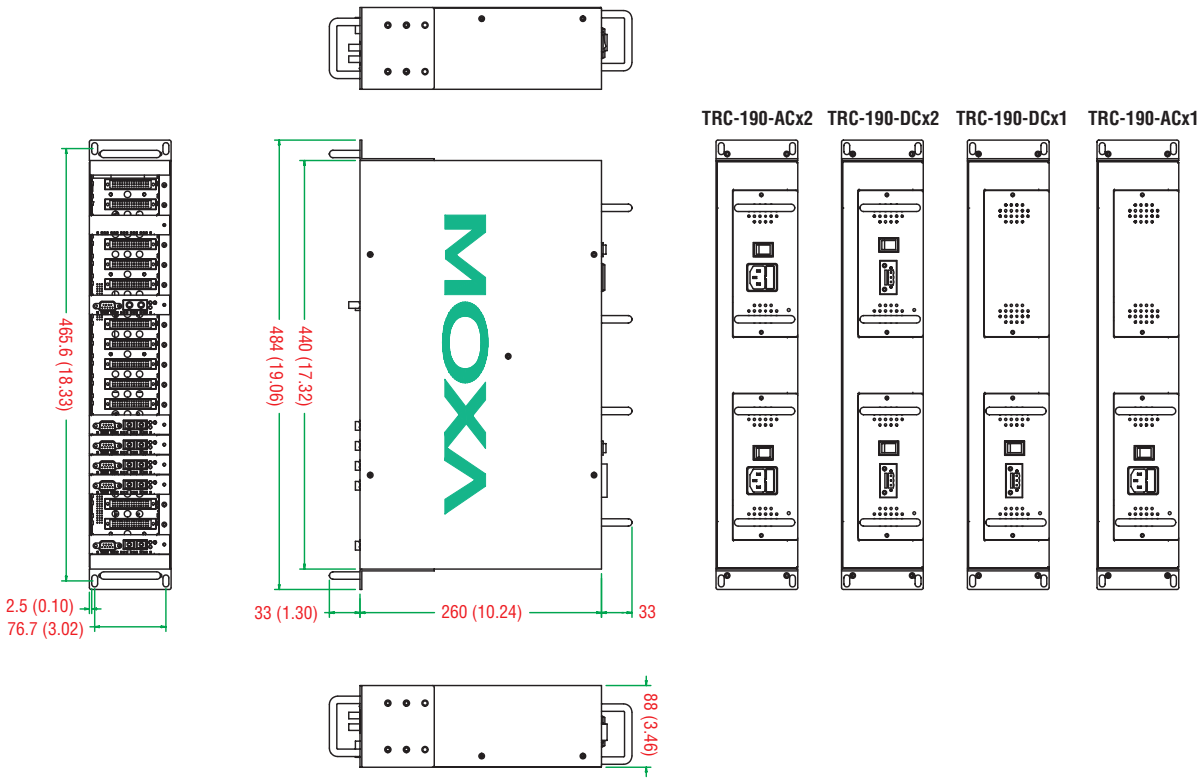
Time: 1,055,112 hrs
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

TRC-190-AC: Rack chassis, 2U, single 110 to 240 VAC input, with 19 slots on front panel
TRC-190-DC-48: Rack chassis, 2U, single 36 to 72 VDC input, with 19 slots on front panel

Available Slide-in Modules

CSM-200-1213: 10/100BaseT(X) to 100BaseFX slide-in module media converter, multi-mode ST connector
CSM-200-1214: 10/100BaseT(X) to 100BaseFX slide-in module media converter, multi-mode SC connector
CSM-200-1218: 10/100BaseT(X) to 100BaseFX slide-in module media converter, single-mode SC connector
TCF-142-M-SC-RM: RS-232/422/485 to multi-mode fiber slide-in module converter, SC connector
TCF-142-M-ST-RM: RS-232/422/485 to multi-mode fiber slide-in module converter, ST connector
TCF-142-S-SC-RM: RS-232/422/485 to single-mode fiber slide-in module converter, SC connector
TCF-142-S-ST-RM: RS-232/422/485 to single-mode fiber slide-in module converter, ST connector

Optional Accessories (can be purchased separately)

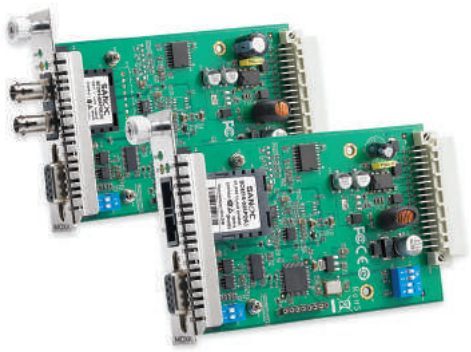
PWR-190-AC: 110 to 240 VAC power supply for the TRC-190-AC
PWR-190-DC-48: 36 to 72 VDC power supply for the TRC-190-DC-48
Plate-1: Faceplate to cover unused front panel slots (required for all unused slots)
Note: One power adapter suitable for your region is included in the product package.

Package Checklist

- 1 TRC-190 with single-power input
- Plate-1: TRC-190 bracket accessory package required for the faceplate to cover unused front panel slots. Includes 18 brackets and 18 screws.
- BKT-PWR: TRC-190 DIN-rail accessory package required for covering unused power slots. Includes 2 L-shaped metal plate and 8 screws.
- PWR-190-DC-48: 36 to 72 VDC power supply (for the TRC-190-DC-48 only)
- PWR-190-AC: 110 to 240 VAC power supply (for theTRC-190-AC only)
- User's manual (printed)
- Warranty card

TCF-142-RM Series

RS-232/422/485 to fiber slide-in modules for the NRack System™



- Extend RS-232/422/485 transmission up to:
  - 40 km with single-mode
  - 5 km with multi-mode
- 1 or 150 kilo-ohm adjustable pull high/low resistor
- "Ring" and "Point-to-Point" transmission supported

Introduction

The TCF-142-RM series of serial-to-fiber converters are slide-in modules that work with the TRC-190 chassis. The modules convert from the RS-232, RS-422, or RS-485 signal to a fiber-optic signal.

Automatic Baudrate Detection

The TCF-142-RM series can automatically detect the serial baudrate. This is an extremely convenient feature. Even if a device's baudrate is changed, the signal will still be transmitted through the media converter without any problem.

Specifications

Optical-Fiber Side

Fiber Connector: SC or ST
Fiber Cable Requirements:

Low-Speed Fiber Module		Multi-Mode	Single-Mode
Fiber Cable Requirements		50/125 µm, 800 MHz	G.652
		62.5/125 µm, 500 MHz	
Typical Distance		5 km	40 km
Wave-length	Typical (nm)	850	1310
	TX Range (nm)	840 to 860	1290 to 1330
	RX Range (nm)	800 to 900	1100 to 1650
Optical Power	TX Range (dBm)	0 to -5	0 to -5
	RX Range (dBm)	0 to -20	0 to -25
	Link Budget (dB)	15	20
	Dispersion Penalty (dB)	1	1

Note: When using a power meter to measure the fiber TX power, set the baudrate to 9,600 bps and send data (00, …, 0h) to the serial converter's serial port.

Point-to-Point Transmission: Half-duplex or full-duplex

RS-232/422/485 Side

Connector: DB9
RS-232 Signals: TxD, RxD, GND
RS-422 Signals: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w Signals: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w Signals: Data+, Data-, GND
Baudrate: 50 bps to 921.6 kbps

Physical Characteristics

Dimensions: 86.8 x 136.5 x 21 mm (3.42 x 5.37 x 0.83 in)
Weight: 105 g (0.23 lb)

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -20 to 75°C (-4 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 VDC
Input Current: 12 VDC @ 150 mA

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
EN 61000-4-2 (ESD): Contact: 4 kV; Air: 8 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 3 V/m
EN 61000-4-4 (EFT): Power: 1 kV; Signal: 0.5 kV
EN 61000-4-5 (Surge): Power: 1 kV; Signal: 0.5 kV
EN 61000-4-6 (CS): 150 kHz to 80 MHz: 3 V/m
EN 61000-4-8 (PFMF)
EN 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE
Freefall: IEC 60068-2-32

MTBF (mean time between failures)

Time: 514,926 hrs
Standard: Telcordia (Bellcore), GB

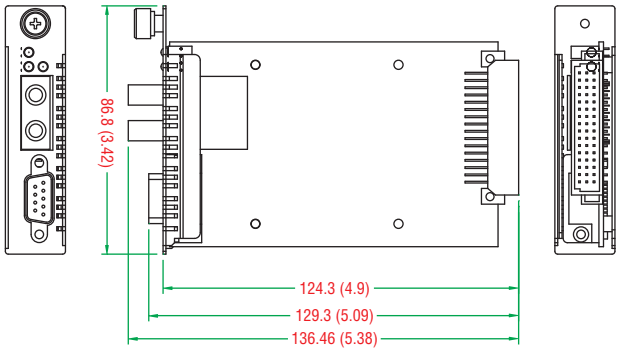
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

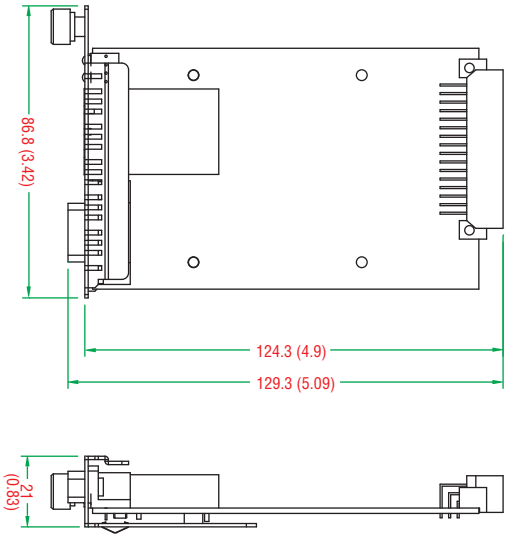
Dimensions

Unit: mm (inch)

TCF-142-M/S-ST-RM Series

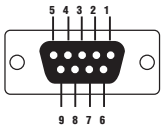


TCF-142-M/S-SC-RM Series



Pin Assignment

DB9 female connector



Pin	RS-232	RS-422/485-4w	RS-485-2w
1	–	RxD-(A)	Data-(A)
2	TxD	RxD+(B)	Data+(B)
3	RxD	TxD+(B)	–
4	–	TxD-(A)	–
5	GND	GND	GND
6	–	–	–
7	–	–	–
8	–	–	–
9	–	–	–

Ordering Information

Available Models

TCF-142-M-SC-RM: RS-232/422/485 to multi-mode fiber slide-in module converter, SC connector
TCF-142-M-ST-RM: RS-232/422/485 to multi-mode fiber slide-in module converter, ST connector
TCF-142-S-SC-RM: RS-232/422/485 to single-mode fiber slide-in module converter, SC connector
TCF-142-S-ST-RM: RS-232/422/485 to single-mode fiber slide-in module converter, ST connector

Package Checklist

- 1 TCF-142-RM fiber converter
- Quick installation guide (printed)
- Warranty card

ICF-1150 Series

Industrial RS-232/422/485 to fiber converters

- 3-way communication: RS-232, fiber, and RS-422/485
- Rotary switch to change the pull high/low resistor value
- Extend RS-232/422/485 transmission up to:
  - 40 km with single-mode
  - 5 km with multi-mode
- 3-way isolation protection (for "I" models only)
- -40 to 85°C wide temperature range models available
- C1D2, ATEX, and IECEx certified for harsh industrial environments

Three-Way Communication

The ICF-1150 series support 2 serial ports, with a DB9 connector for RS-232 communication and a removable terminal block for RS-422 or RS-485 communication. The 3 ports (2 serial ports and one fiber port) are completely independent. When an ICF-1150 converter receives data from any one port, it will send the data through the other 2 ports. For example, once the ICF-1150 converter receives a command from the remote master through the fiber port, it will convert the signal and send the command through the RS-232 and RS-422/485 ports at the same time. If the user is monitoring a system running on an RS-485 network, there is no need to use an additional RS-232 to RS-485 converter to connect the laptop computer's serial port to the RS-485 bus.

Rotary Switch for Setting the Pull High/Low Resistor

The RS-485 interface supports multidrop or daisy-chain connections, which system engineers will use to connect serial devices such as meters, RTUs, and readers, together on the same bus. Since the number of serial devices on the same bus will cause the impedance of the data line to increase, the ICF-1150 allows users to tune the pull high/low resistor. Just rotate the switch to the appropriate value without removing the ICF-1150 from the DIN rail.

Pull High/Low Resistor Values

Position	0	1	2	3	4	5	6	7	8	9
ohms	150k	10k	4.7k	3.3k	1k	909	822	770	500	485

Specifications

Optical-Fiber Side

Fiber Connector: SC or ST
Fiber Cable Requirements:

Low-Speed Fiber Module		Multi-Mode	Single-Mode
Fiber Cable Requirements		50/125 µm, 800 MHz 62.5/125 µm, 500 MHz	G.652
Typical Distance		5 km	40 km
Wave-length	Typical (nm)	850	1310
	TX Range (nm)	840 to 860	1290 to 1330
	RX Range (nm)	800 to 900	1100 to 1650
Optical Power	TX Range (dBm)	0 to -5	0 to -5
	RX Range (dBm)	0 to -20	0 to -25
	Link Budget (dB)	15	20
	Dispersion Penalty (dB)	1	1

Note: When using a power meter to measure the fiber TX power, set the baudrate to 9,600 bps and send data (00, …, 0h) to the serial converter's serial port.

Ring Transmission: Half-duplex
Point-to-Point Transmission: Half-duplex or full-duplex

RS-232/422/485 Side

RS-232 Signals: TxD, RxD, GND
RS-422 Signals: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w Signals: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w Signals: Data+, Data-, GND
Baudrate: 50 bps to 921.6 kbps
Isolation: 2 kV RMS isolation per I/O port for 1 minute

Physical Characteristics

Housing: Metal
Dimensions: 30.3 x 70 x 115 mm (1.19 x 2.76 x 4.53 in)
Weight: 330 g (0.73 lb)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current:
ICF-1150: 127 mA @ 12 VDC
ICF-1150I: 163 mA @ 12 VDC
Voltage Reversal Protection: Protects against V+/V- reversal
Overcurrent Protection: 1.1 A (protects against two signals shorted together)

Standards and Certifications

Safety: UL 508
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2 EEx nC IIC, IECEx
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
EN 61000-4-2 (ESD): Contact: 8 kV; Air: 15 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 3 V/m
EN 61000-4-4 (EFT): Power: 4 kV; Signal: 2 kV
EN 61000-4-5 (Surge): Power: 4 kV; Signal: 0.5 kV
EN 61000-4-6 (CS): 150 kHz to 80 MHz: 3 V/m
EN 61000-4-8 (PFMF)
Green Product: RoHS, CRoHS, WEEE
Freefall: IEC 60068-2-32

MTBF (mean time between failures)

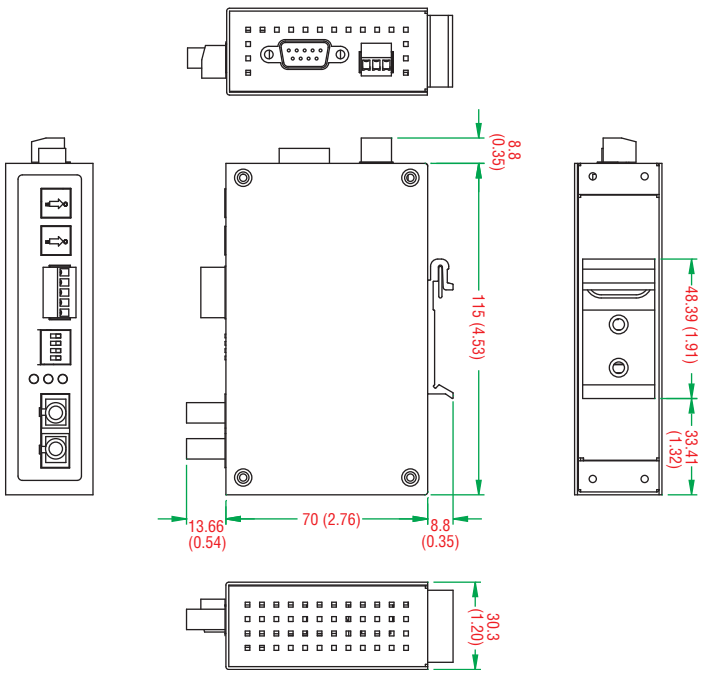
Time: 792,085 hrs
Standard: Telcordia (Bellcore), GB
Water and Dust Proof: IP30

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

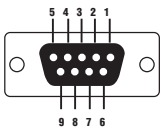
Dimensions

Unit: mm (inch)



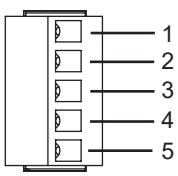
Pin Assignment

DB9 female connector



Pin	RS-232
1	–
2	TxD
3	RxD
4	–
5	GND
6	–
7	–
8	–

Terminal block connector



Pin	RS-422/485-4w	RS-485-2w
1	GND	GND
2	RxD-(A)	Data-(A)
3	RxD+(B)	Data+(B)
4	TxD-(A)	–
5	TxD+(B)	–

Ordering Information

Available Models

ICF-1150-M-SC: Industrial RS-232/422/485 to multi-mode fiber converter, SC connector, 0 to 60°C operating temperature
ICF-1150-M-ST: Industrial RS-232/422/485 to multi-mode fiber converter, ST connector, 0 to 60°C operating temperature
ICF-1150-S-SC: Industrial RS-232/422/485 to single-mode fiber converter, SC connector, 0 to 60°C operating temperature
ICF-1150-S-ST: Industrial RS-232/422/485 to single-mode fiber converter, ST connector, 0 to 60°C operating temperature
ICF-1150I-M-SC: Industrial RS-232/422/485 to multi-mode fiber converter, SC connector, 2 kV isolation, 0 to 60°C operating temperature
ICF-1150I-M-ST: Industrial RS-232/422/485 to multi-mode fiber converter, ST connector, 2 kV isolation, 0 to 60°C operating temperature
ICF-1150I-S-SC: Industrial RS-232/422/485 to single-mode fiber converter, SC connector, 2 kV isolation, 0 to 60°C operating temperature
ICF-1150I-S-ST: Industrial RS-232/422/485 to single-mode fiber converter, ST connector, 2 kV isolation, 0 to 60°C operating temperature
ICF-1150-M-SC-T: Industrial RS-232/422/485 to multi-mode fiber converter, SC connector, -40 to 85°C operating temperature
ICF-1150-M-ST-T: Industrial RS-232/422/485 to multi-mode fiber converter, ST connector, -40 to 85°C operating temperature
ICF-1150-S-SC-T: Industrial RS-232/422/485 to single-mode fiber converter, SC connector, -40 to 85°C operating temperature
ICF-1150-S-ST-T: Industrial RS-232/422/485 to single-mode fiber converter, ST connector, -40 to 85°C operating temperature
ICF-1150I-M-SC-T: Industrial RS-232/422/485 to multi-mode fiber converter, SC connector, 2 kV isolation, -40 to 85°C operating temperature
ICF-1150I-M-ST-T: Industrial RS-232/422/485 to multi-mode fiber converter, ST connector, 2 kV isolation, -40 to 85°C operating temperature
ICF-1150I-S-SC-T: Industrial RS-232/422/485 to single-mode fiber converter, SC connector, 2 kV isolation, -40 to 85°C operating temperature
ICF-1150I-S-ST-T: Industrial RS-232/422/485 to single-mode fiber converter, ST connector, 2 kV isolation, -40 to 85°C operating temperature

Package Checklist

- 1 ICF-1150 series fiber converter
- Quick installation guide (printed)
- Warranty card

IECEx Models

ICF-1150-M-SC-IEX: Industrial RS-232/422/485 to multi-mode fiber converter, SC connector, IECEx, 0 to 60°C operating temperature
ICF-1150-M-ST-IEX: Industrial RS-232/422/485 to multi-mode fiber converter, ST connector, IECEx, 0 to 60°C operating temperature
ICF-1150-S-SC-IEX: Industrial RS-232/422/485 to single-mode fiber converter, SC connector, IECEx, 0 to 60°C operating temperature
ICF-1150-S-ST-IEX: Industrial RS-232/422/485 to single-mode fiber converter, ST connector, IECEx, 0 to 60°C operating temperature
ICF-1150I-M-SC-IEX: Industrial RS-232/422/485 to multi-mode fiber converter, SC connector, 2 kV isolation, IECEx, 0 to 60°C operating temperature
ICF-1150I-M-ST-IEX: Industrial RS-232/422/485 to multi-mode fiber converter, ST connector, 2 kV isolation, IECEx, 0 to 60°C operating temperature
ICF-1150I-S-SC-IEX: Industrial RS-232/422/485 to single-mode fiber converter, SC connector, 2 kV isolation, IECEx, 0 to 60°C operating temperature
ICF-1150I-S-ST-IEX: Industrial RS-232/422/485 to single-mode fiber converter, ST connector, 2 kV isolation, IECEx, 0 to 60°C operating temperature
ICF-1150-M-SC-T-IEX: Industrial RS-232/422/485 to multi-mode fiber converter, SC connector, IECEx, -40 to 85°C operating temperature
ICF-1150-M-ST-T-IEX: Industrial RS-232/422/485 to multi-mode fiber converter, ST connector, IECEx, -40 to 85°C operating temperature
ICF-1150-S-SC-T-IEX: Industrial RS-232/422/485 to single-mode fiber converter, SC connector, IECEx, -40 to 85°C operating temperature
ICF-1150-S-ST-T-IEX: Industrial RS-232/422/485 to single-mode fiber converter, ST connector, IECEx, -40 to 85°C operating temperature
ICF-1150I-M-SC-T-IEX: Industrial RS-232/422/485 to multi-mode fiber converter, SC connector, 2 kV isolation, IECEx, -40 to 85°C operating temperature
ICF-1150I-M-ST-T-IEX: Industrial RS-232/422/485 to multi-mode fiber converter, ST connector, 2 kV isolation, IECEx, -40 to 85°C operating temperature
ICF-1150I-S-SC-T-IEX: Industrial RS-232/422/485 to single-mode fiber converter, SC connector, 2 kV isolation, IECEx, -40 to 85°C operating temperature
ICF-1150I-S-ST-T-IEX: Industrial RS-232/422/485 to single-mode fiber converter, ST connector, 2 kV isolation, IECEx, -40 to 85°C operating temperature

Optional Accessories (can be purchased separately)

DR-4524: 45 W, 2 A DIN-rail 24 VDC power supply with universal 85 to 264 VAC input

TCF-142 Series

RS-232/422/485 to fiber converters

- "Ring" and "Point- to-Point" transmission
- Extends RS-232/422/485 transmission up to:
  - 40 km with single-mode—TCF-142-S
  - 5 km with multi-mode—TCF-142-M
- Decreases signal interference
- Protects against electrical interference and chemical corrosion
- Supports baudrates up to 921.6 kbps
- Wide temperature range models available (-40 to 75°C)

Introduction

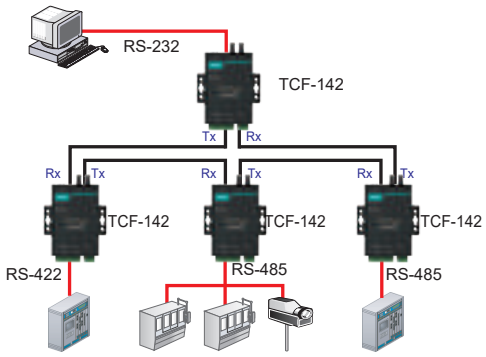
The TCF-142 media converters are equipped with a multiple interface circuit that can handle RS-232 or RS-422/485 serial interfaces and multi-mode or single-mode fiber. TCF-142 converters are used to extend serial transmission up to 5 km (TCF-142-M with multi-mode fiber) or up to 40 km (TCF-142-S with single-mode fiber). The TCF-142 converters can be configured to convert either RS-232 signals, or RS-422/485 signals, but not both at the same time.

Automatic Baudrate Detection

The TCF-142 converters can automatically detect the serial baudrate. This is an extremely convenient feature. Even if a device's baudrate is changed, the signal will still be transmitted through the media converter without any data loss.

Ring Operation

The TCF-142 converters can be used to connect serial devices to a fiber ring. To form the ring, connect the Tx port of one TCF-142 to the Rx port of a neighboring converter. Once the ring is set up, simply use the DIP switches to configure the TCF-142 converters for "ring mode." When one node transmits a signal, the signal travels around the ring until it returns back to the transmitting unit, which then blocks the signal. With the TCF-142, you can set up fiber rings that have a total circumference of up to 100 km.



Automatic Data Direction Control (ADDC®)

ADDC® is a patented hardware data flow solution developed by Moxa to handle RS-485 data direction control. ADDC® senses and controls RS-485 data direction automatically, making it unnecessary to use the handshaking signal.

Specifications

Optical-Fiber Side

Fiber Connector: SC or ST
Fiber Cable Requirements:

Low-Speed Fiber Module		Multi-Mode	Single-Mode
Fiber Cable Requirements		50/125 µm, 800 MHz 62.5/125 µm, 500 MHz	G.652
Typical Distance		5 km	40 km
Wave-length	Typical (nm)	850	1310
	TX Range (nm)	840 to 860	1290 to 1330
	RX Range (nm)	800 to 900	1100 to 1650
Optical Power	TX Range (dBm)	0 to -5	0 to -5
	RX Range (dBm)	0 to -20	0 to -25
	Link Budget (dB)	15	20
	Dispersion Penalty (dB)	1	1

Note: When using a power meter to measure the fiber TX power, set the baudrate to 9,600 bps and send data (00, …, 0h) to the serial converter's serial port.

Ring Transmission: Half-duplex
Point-to-Point Transmission: Half-duplex or full-duplex

RS-232/422/485 Side

Connector: Terminal Block
RS-232 Signals: Tx, Rx, GND
RS-422 Signals: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w Signals: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w Signals: Data+, Data-, GND
Baudrate: 50 bps to 921.6 kbps

Physical Characteristics

Housing: Metal
Dimensions:
Without ears: 67 x 100 x 22 mm (2.64 x 3.94 x 0.87 in)
With ears: 90 x 100 x 22 mm (3.54 x 3.94 x 0.87 in)
Weight: 320 g (0.71 lb)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current: 140 mA @ 12 VDC
Power Line Protection:
1 kV Burst (EFT), EN61000-4-4
1 kV Surge, EN61000-4-5
Voltage Reversal Protection: Protects against V+/V- reversal
Overcurrent Protection: 1.1 A (protects against two signals shorted together)

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
EN 61000-4-2 (ESD): Contact: 6 kV; Air: 8 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 10 V/m
EN 61000-4-4 (EFT): Power: 1 kV
EN 61000-4-5 (Surge): Power: 1 kV
EN 61000-4-6 (CS): 150 kHz to 80 MHz: 3 V/m
EN 61000-4-8 (PFMF)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

Time: 780,480 hrs
Standard: Telcordia (Bellcore), GB

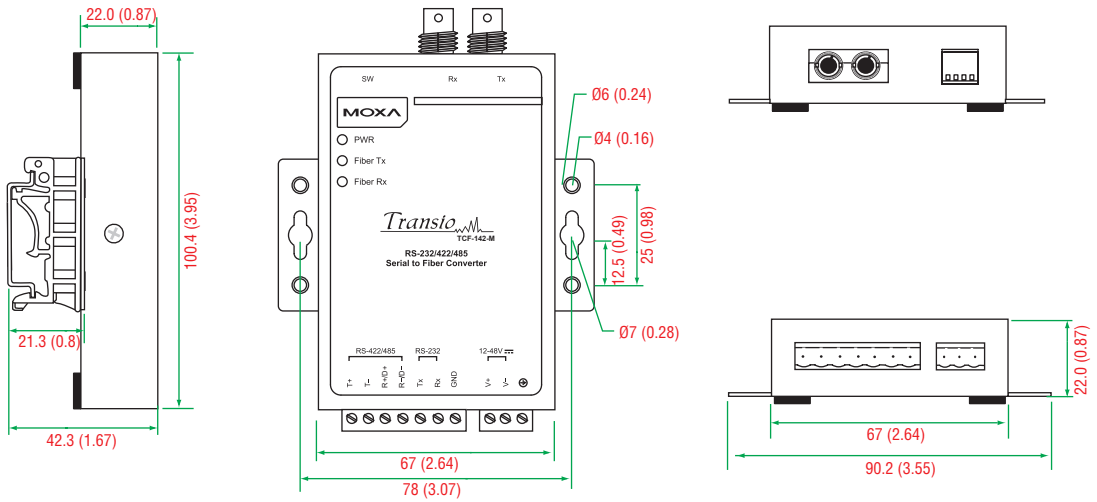
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

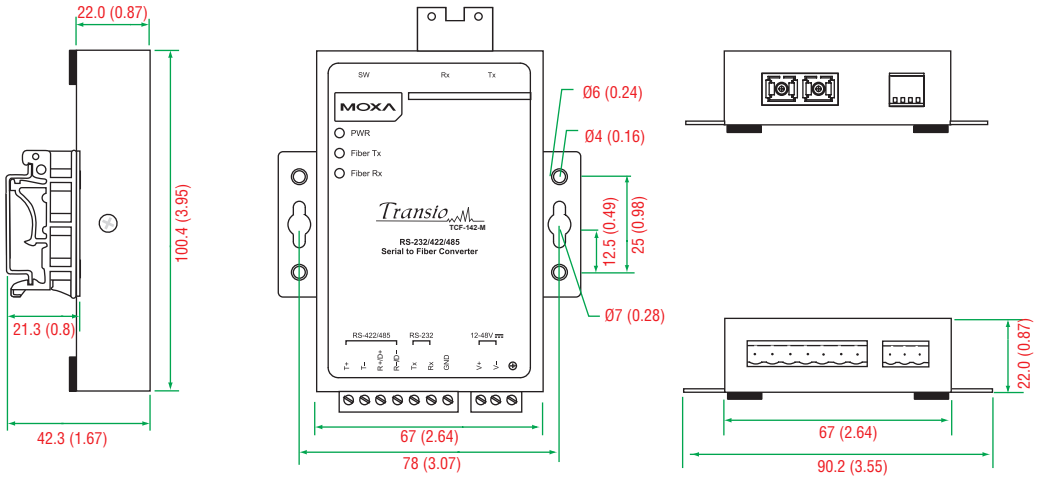
TCF-142-M/S-ST



Dimensions

Unit: mm (inch)

TCF-142-M/S-SC



Ordering Information

Available Models

TCF-142-M-SC: RS-232/422/485 to multi-mode optical-fiber media converter with fiber ring support and SC connector, 0 to 60°C operating temperature
TCF-142-M-ST: RS-232/422/485 to multi-mode optical-fiber media converter with fiber ring support and ST connector, 0 to 60°C operating temperature
TCF-142-S-SC: RS-232/422/485 to single-mode optical-fiber media converter with fiber ring support and SC connector, 0 to 60°C operating temperature
TCF-142-S-ST: RS-232/422/485 to single-mode optical-fiber media converter with fiber ring support and ST connector, 0 to 60°C operating temperature
TCF-142-M-SC-T: RS-232/422/485 to multi-mode optical-fiber media converter with fiber ring support and SC connector, -40 to 75°C operating temperature
TCF-142-M-ST-T: RS-232/422/485 to multi-mode optical-fiber media converter with fiber ring support and ST connector, -40 to 75°C operating temperature
TCF-142-S-SC-T: RS-232/422/485 to single-mode optical-fiber media converter with fiber ring support and SC connector, -40 to 75°C operating temperature
TCF-142-S-ST-T: RS-232/422/485 to single-mode optical-fiber media converter with fiber ring support and ST connector, -40 to 75°C operating temperature

Package Checklist

- 1 TCF-142 media converter
- Power wiring: CBL-PJTB-10
- Rubber pad
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

DK35A: DIN-rail mounting clips, 35 mm, 2 DIN-rail plates with 4 screws
Note: Additional power adapters can be purchased separately. See Appendix A for details.

TCF-90 Series

Port-powered RS-232 to fiber converters

USB Power | Port Power | Ext. Power

- Use either external power or power over serial
- Extends RS-232 transmission up to:
  - 40 km with single-mode—TCF-90-S
  - 5 km with multi-mode—TCF-90-M
- Reduces signal interference
- Protects against electrical interference or chemical corrosion
- Compact size

RoHS | c UL us LISTED | CE | FC

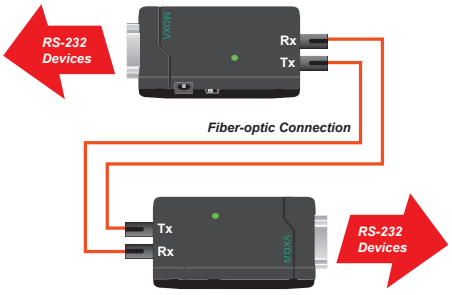
Specifications

The TCF-90 is a compact media converter that transmits RS-232 signals over optical fiber. Power is derived from either the serial port or an external power source. The TCF-90 extends RS-232 transmission up to 5 km with multi-mode fiber, or up to 40 km with single-mode fiber. A pair of TCF-90 converters can be used to connect two RS-232 devices with optical fiber in full-duplex mode. The optical fiber isolates the data signals from dangerous increases in ground potential, ground loops, and electrical EMI/RFI noise, and it enhances data security by eliminating the harmful effects of RF radiation and susceptibility to electromagnetic radiation.

Self-powered RS-232 to Optical Fiber

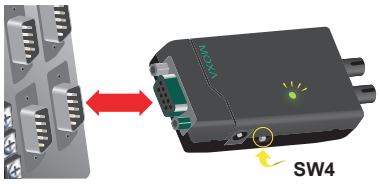
Connecting RS-232 devices to the TCF-90 is easy. The ST-type optical-fiber connector is designed especially for data communication applications that transmit data either between or within buildings. The TCF-90 can be used for industrial applications and for applications that require secure data transfer.

The RS-232 port on the TCF-90 uses a DB9 female socket to connect directly to the host PC, with power drawn from the TxD, RTS, and DTR lines. Although the TCF-90 can obtain enough power from the three data/handshake lines, whether the signal is high or low, we strongly recommend setting either the RTS or DTR signal to ON.



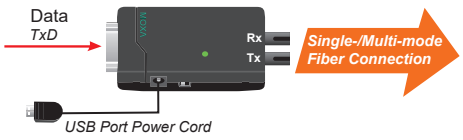
LED Port Power Indicator

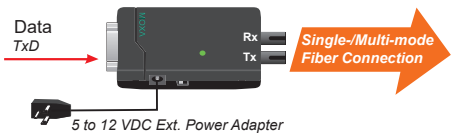
It's easy enough to use a multimeter to test if the serial device is supplying the TCF-90 with enough power through the serial connection, but why bother when the TCF-90 can do the testing for you? Connect the TCF-90 to the device's RS-232 port and set the SW4 switch to Test mode. If the port power LED indicator lights up, the TCF-90 is receiving enough power. If the LED does NOT light up, you will need to attach an external power source to the TCF-90.



Optional External Power Source

In most circumstances, the TCF-90 should be able to operate without using an external power source. However, an external USB power cord or DC power supply can be used in situations where the handshake lines are not available, both the RTS/DTR signals are set to OFF, or the attached device's serial interface chip provides less power than required.





Specifications

Optical-Fiber Side

Fiber Connector: ST

Fiber Cable Requirements:

Low-Speed Fiber Module		Multi-Mode	Single-Mode
Fiber Cable Requirements		50/125 µm, 800 MHz 62.5/125 µm, 500 MHz	G.652
Typical Distance		5 km	40 km
Wave-length	Typical (nm)	850	1310
	TX Range (nm)	840 to 860	1290 to 1330
	RX Range (nm)	800 to 900	1100 to 1650
Optical Power	TX Range (dBm)	0 to -5	0 to -5
	RX Range (dBm)	0 to -20	0 to -25
	Link Budget (dB)	15	20
	Dispersion Penalty (dB)	1	1

Note: When using a power meter to measure the fiber TX power, set the baudrate to 9,600 bps and send data (00, …, 0h) to the serial converter's serial port.

RS-232 Side

Connector: DB9 female

Signals:

RS-232 Tx, Rx, GND (Loop-back wiring: RTS to CTS, DTR to DSR and DCD)

Baudrate: 300 bps to 115.2 kbps

Physical Characteristics

Housing: ABS + PC

Dimensions: 42 x 80 x 22 mm (1.65 x 3.15 x 0.87 in)

Weight: 150 g (0.33 lb)

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)

Storage Temperature: -20 to 75°C (-4 to 167°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Source of Input Power: RS-232 port (TxD, RTS, DTR) or power input jack

Input Voltage: 5 to 12 VDC

Input Current: 20 mA @ 5 VDC (with termination disabled)

Standards and Certifications

Safety: UL 60950-1

EMC: EN 55022/24

EMI: CISPR 22, FCC Part 15B Class B

EMS:

EN 61000-4-2 (ESD): Contact: 4 kV; Air: 8 kV

EN 61000-4-3 (RS): 80 MHz to 1 GHz: 3 V/m

EN 61000-4-4 (EFT): Power: 0.5 kV; Signal: 0.5 kV

EN 61000-4-5 (Surge): Power: 2 kV; Signal: 1 kV

EN 61000-4-6 (CS): 150 kHz to 80 MHz: 3 V/m

EN 61000-4-8 (PFMF)

Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

Time: 2,272,562 hrs

Standard: MIL-HDBK-217F

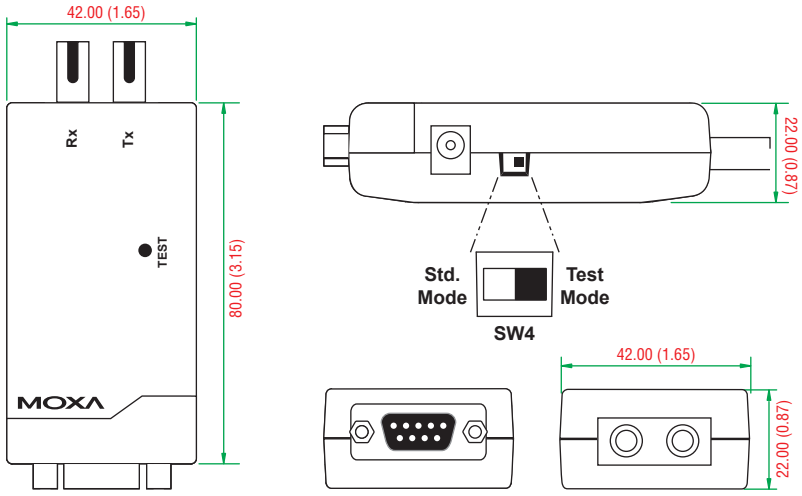
Warranty

Warranty Period: 5 years

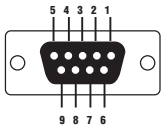
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



DB9 female connector



PIN	RS-232
1	DCD
2	TxD
3	RxD
4	DSR
5	GND
6	DTR
7	CTS
8	RTS

Ordering Information

Available Models

TCF-90-M: Port-powered RS-232 to multi-mode optical-fiber converter with ST connector for 5 km transmission

TCF-90-S: Port-powered RS-232 to single-mode optical-fiber converter with ST connector for 40 km transmission

Note: Models with SC/FC connectors or a 60 km range are available by request.

Optional Accessories (can be purchased separately)

Power Adapter: See Appendix A for details

CBL-F9M9-20: DB9 male to DB9 female RS-232 cable (20 cm)

Package Checklist

- 1 TCF-90 series media converter
- USB power cord, 50 cm
- Quick installation guide
- Warranty card

TCC-100/100I Series

Industrial RS-232 to RS-422/485 converters with optional 2 kV isolation

- RS-232 to RS-422 conversion with RTS/CTS support
- RS-232 to 2-wire or 4-wire RS-485 conversion
- 2 kV isolation protection (TCC-100I)
- Wall- and DIN-rail mounting
- Plug-in terminal block for easy RS-422/485 wiring
- LED indicators for power, Tx, Rx
- Wide temperature range model available (-40 to 85°C)

Ext. Power | 2 KV Isolation

RoHS | c UL us LISTED | CE | FC

Introduction

The TCC-100/100I series RS-232 to RS-422/485 converters increase networking capability by extending the RS-232 transmission distance. Both converters have a superior industrial-grade design that includes DIN-rail mounting, terminal block wiring, an external terminal block for power, and optical isolation (TCC-100I and TCC-100I-T only). The TCC-100/100I series converters are ideal solutions for converting RS-232 signals to RS-422/485 in critical industrial environments.

Specifications

RS-232 Side

Connector: DB9 female
Signals: TxD, RxD, RTS, CTS, GND

RS-422/485 Side

Connector: Terminal Block
Signals:
(interface selected by DIP switch)
RS-422: TxD+, TxD-, RxD+, RxD-, RTS, CTS, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND
RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)

Serial Communication

Baudrate: 50 bps to 921.6 kbps
Optical Isolation: 2 kV (TCC-100I/100I-T)

Physical Characteristics

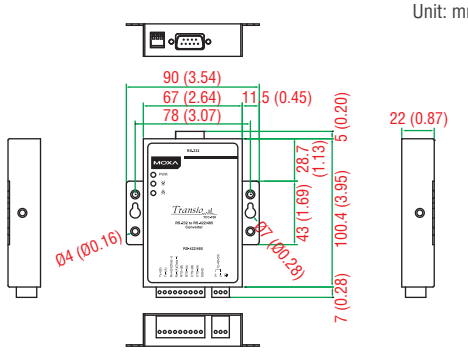
Housing: Metal
Dimensions: 67 x 100.4 x 22 mm (2.64 x 3.93 x 0.87 in)
Weight: 148 g (0.33 lb)

Environmental Limits

Operating Temperature:
Standard Models: -20 to 60°C (-4 to 140°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Dimensions

Unit: mm (inch)



Power Requirements

Source of Input Power: Power input jack
Input Voltage: 12 to 48 VDC
Input Current:
TCC-100/100-T: 85 mA @ 12 VDC
TCC-100I/100I-T: 150 mA @ 12 VDC
Voltage Reversal Protection: Protects against V+/V- reversal
Overcurrent Protection: Protects against two signals shorted together

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
EN 61000-4-2 (ESD): Contact: 4 kV; Air: 8 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 3 V/m
EN 61000-4-4 (EFT): Power: 1 kV; Signal: 0.5 kV
EN 61000-4-5 (Surge): Power: 1 kV
EN 61000-4-6 (CS): 150 kHz to 80 MHz: 3 V/m
EN 61000-4-8 (PFMF)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

Time: 3,017,857 hrs
Standard: MIL-HDBK-217F

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models

TCC-100: RS-232 to RS-422/485 converter, -20 to 60°C operating temperature
TCC-100I: RS-232 to RS-422/485 converter with optical isolation, -20 to 60°C operating temperature
TCC-100-T: RS-232 to RS-422/485 converter, -40 to 85°C operating temperature
TCC-100I-T: RS-232 to RS-422/485 converter with optical isolation, -40 to 85°C operating temperature

Package Checklist

- 1 TCC-100/100I media converter
- Power wiring: CBL-PJTB-10
- Mounting kit: DK35A
- Quick installation guide (printed)
- Warranty card
- Rubber pad

TCC-80/80I Series

Port-powered RS-232 to RS-422/485 converters with optional 2.5 kV isolation

- External power source supported but not required
- Compact size
- Converts RS-422, and both 2-wire and 4-wire RS-485
- RS-485 automatic data direction control
- Automatic baudrate detection
- Built-in 120-ohm termination resistors
- 2.5 kV isolation (for TCC-80I only)
- LED port power indicator

USB Power | Port Power | Ext. Power | 2.5KV Isolation

RoHS | c UL us LISTED | CE | FC

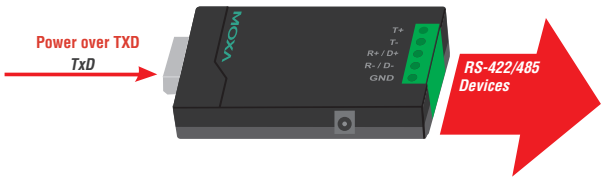
Introduction

The TCC-80/80I media converters provide complete signal conversion between RS-232 and RS-422/485, without requiring an external power source. The converters support both half-duplex 2-wire RS-485 and full-duplex 4-wire RS-422/485, either of which can be converted between RS-232's TxD and RxD lines. In addition, the TCC-80I is the world's first high-speed, port-powered converter with 2.5 kV isolation.

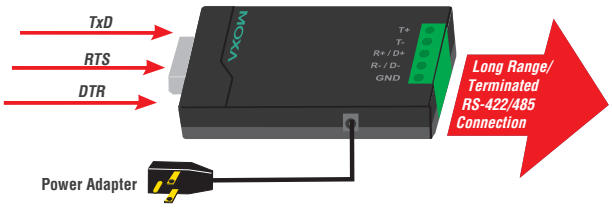
Automatic data direction control is provided for RS-485. In this case, the RS-485 driver is enabled automatically when the circuitry senses the TxD output from the RS-232 signal. This means that no programming effort is required to control the transmission direction of the RS-485 signal. Moreover, the TCC-80I's patented LED port power indicator lets you check whether or not the TCC-80I is receiving enough power.

Port Power over RS-232

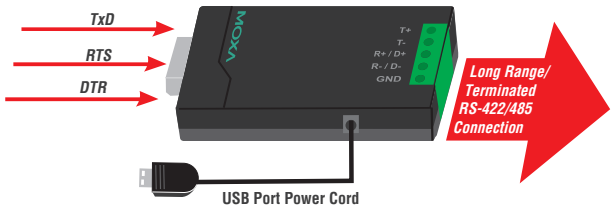
The RS-232 port of the TCC-80/80I is a DB9 female socket that can connect directly to the host PC, with power drawn from the TxD line. Regardless of whether the signal is high or low, the TCC-80/80I can obtain enough power from the data line. However, external power can be used if the handshake line is not available, if the serial cable is too long, or if the RS-232 device is a low-power device. For external power, a 5 to 12 VDC power supply can be connected using an adapter or a USB power cord.



External Power Adapter



USB Power

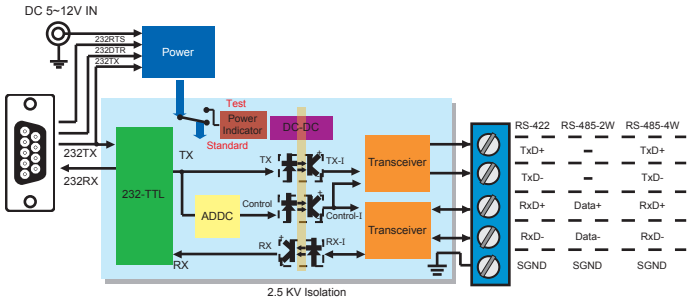


Port Power Dissipation

When installing a TCC-80 or TCC-80I converter, it is important to pay attention to power consumption, RS-232 cable length, and RS-422/485 transmission distance. In general, the TCC-80 and TCC-80I obtain 50 mW of power from the power source. Standard PC COM ports can provide 70 to 90 mW of power if the TxD, RTS, and DTR lines are connected. Moreover, the RS-232 cable should be shorter than 15 m (@ 9600 bps) to ensure that less power is lost from the host/device to the TCC-80. The remainder of the supplied power is used for transmitting the RS-422/485 signal.

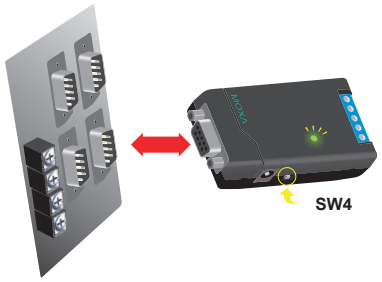
Port Power and Optical Isolation

The RS-232 port of the TCC-80/80I is a DB9 female socket that can connect directly to the host PC, with power drawn from the TxD line. Electrical 2.5 kV isolation for the TCC-80I is achieved with a photo coupler that transforms the electrical signal into light, and then re-transforms the light back into an electrical signal on the other side. In this way, the two electrical circuits are completely isolated from each other. This also protects the devices from ground loop currents, reduces damage caused by data loss, and prevents damage to the communication interfaces.



LED Port Power Indicator

It's easy enough to test the serial device with a multimeter to determine that the serial device will provide enough power to the media converter. However, it's even easier to let the TCC-80I test the device for you. Simply connect the TCC-80I to the device's RS-232 port and set the SW4 switch to Test mode. If the patented port power LED indicator lights up, the TCC-80I is receiving enough power. If the LED does not light up, you will need to attach an external power source to the TCC-80I.



Specifications

RS-232 Side

Connector: DB9 female
Signals:
RS-232: TxD, RxD, GND
(Loop-back wiring: RTS to CTS, DTR to DSR and DCD)

RS-422/485 Side

Connector: Terminal Block or DB9 male
Signals:
(interface selected by DIP switch)
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND
RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)

Serial Communication

Baudrate: 50 bps to 115.2 kbps
Optical Isolation: 2.5 kV rms for 1 minute (TCC-80I only)

Physical Characteristics

Housing: ABS + PC
Dimensions:
TCC-80/80I: 42 x 80 x 22 mm (1.65 x 3.15 x 0.87 in)
TCC-80-DB9/80I-DB9: 42 x 91 x 23.6 mm (1.65 x 3.58 x 0.93 in)
Weight: 50 g (0.11 lb)

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -20 to 75°C (-4 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Source of Input Power: RS-232 port (TxD, RTS, DTR) or power input jack
Input Voltage: 5 to 12 VDC
Input Current:
TCC-80: 10 mA @ 5 VDC (with termination disabled)
TCC-80I: 20 mA @ 5 VDC (with termination disabled)

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
EN 61000-4-2 (ESD): Contact: 4 kV; Air: 8 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 3 V/m
EN 61000-4-4 (EFT): Power: 1 kV
EN 61000-4-5 (Surge): Power: 1 kV
EN 61000-4-6 (CS): 150 kHz to 80 MHz: 3 V/m
EN 61000-4-8 (PFMF)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

Time: 2,781,161 hrs
Standard: Telcordia (Bellcore), GB

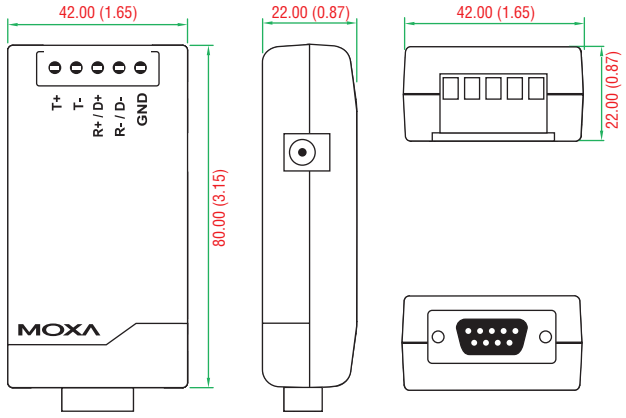
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

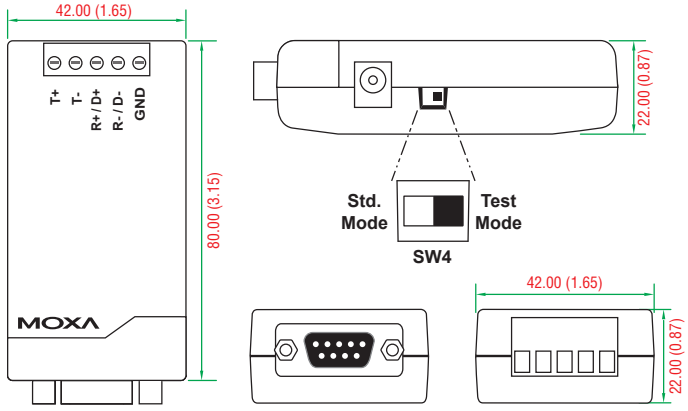
Dimensions

Unit: mm (inch)

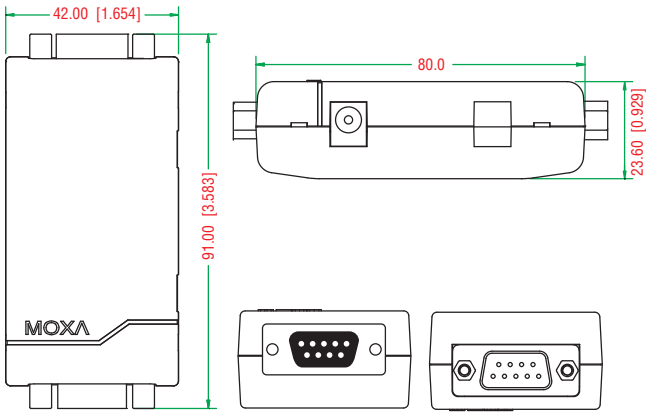
TCC-80



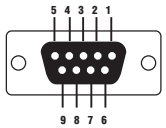
TCC-80I



TCC-80-DB9, TCC-80I-DB9



DB9 female connector

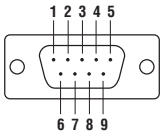


PIN	RS-232
1	DCD
2	TxD
3	RxD
4	DSR
5	GND
6	DTR
7	CTS
8	RTS

DIP Switch Settings

DIP Switch Settings			
RS-422 with Terminator	SW1	SW2	SW3
	OFF	OFF	ON
RS-422	SW1	SW2	SW3
	OFF	OFF	OFF
4-wire RS-485 with Terminator	SW1	SW2	SW3
	ON	OFF	ON
4-wire RS-485	SW1	SW2	SW3
	ON	OFF	OFF
2-wire RS-485 with Terminator	SW1	SW2	SW3
	ON	ON	ON
2-wire RS-485	SW1	SW2	SW3
	ON	ON	OFF

DB9 male RS-422/485 port



PIN	RS-422/RS-485-4w	RS-485-2w
1	TxD+(B)	–
2	TxD-(A)	–
3	RxD+(B)	Data+(B)
4	RxD-(A)	Data-(A)
5	GND	GND
6	–	–
7	–	–
8	–	–

Ordering Information

Available Models

TCC-80: Port-powered RS-232 to RS-422/485 converter with terminal block on the RS-422/485 side
TCC-80-DB9: Port-powered RS-232 to RS-422/485 converter with DB9 male connector on the RS-422/485 side
TCC-80I: Port-powered RS-232 to RS-422/485 converter with terminal block on the RS-422/485 side, and 2.5 kV optical isolation
TCC-80I-DB9: Port-powered RS-232 to RS-422/485 converter with DB9 male connector on the RS-422/485 side, and 2.5 kV optical isolation

Optional Accessories (can be purchased separately)

CBL-F9M9-20: DB9 male to DB9 female RS-232 cable (20 cm)
Note: Additional power adapters can be purchased separately. See Appendix A for details.
Power Adapter: See Appendix A for details

Package Checklist

- 1 TCC-80 or TCC-80I media converter
- CBL-USBAP-50: USB A male, 2.1 mm DC jack cable, 50 cm
- Quick installation guide (printed)
- Warranty card

TCC-120/120I

Industrial RS-422/485 converters/repeaters with optional 2 kV isolation

- Boost serial signal to extend transmission distance
- Wall- or DIN-rail mounting
- Terminal block for easy wiring
- Power input from terminal block
- DIP switch setting for built-in terminator (120 ohm)
- Boost RS-422 or RS-485 signal, or convert RS-422 to RS-485
- 2 kV isolation protection (TCC-120I)

2 KV Isolation

Introduction

The TCC-120 and TCC-120I are RS-422/485 converters/repeaters designed to extend RS-422/485 transmission distance. Both products have a superior industrial-grade design that includes DIN-rail mounting, terminal block wiring, and an external terminal block for power. In addition, the TCC-120I supports optical isolation for system protection. The TCC-120 and TCC-120I are ideal RS-422/485 converters/repeaters for critical industrial environments.

Specifications

Serial Communication

Connectors: Terminal Block on both ends
Baudrate: 50 bps to 921.6 kbps
Signals:
RS-422/485-4w: TxD+, TxD-, RxD+, RxD-
RS-485-2w: Data+, Data-
RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)
Optical Isolation: 2 kV (TCC-120I only)

Physical Characteristics

Housing: Metal
Dimensions: 67 x 100.4 x 22 mm (2.64 x 3.93 x 0.87 in)
Weight: 148 g (0.33 lb)

Environmental Limits

Operating Temperature: -20 to 60°C (-4 to 140°F)
Storage Temperature: -20 to 75°C (-4 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Source of Power Input: Power input jack
Input Voltage: 12 to 48 VDC
Input Current:
TCC-120: 65 mA @ 12 VDC
TCC-120I: 180 mA @ 12 VDC
Voltage Reversal Protection: Protects against V+/V- reversal
Overcurrent Protection: Protects against two signals shorted together

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
EN 61000-4-2 (ESD): Contact: 4 kV; Air: 8 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 3 V/m
EN 61000-4-4 (EFT): Power: 1 kV; Signal: 0.5 kV
EN 61000-4-5 (Surge): Power: 1 kV
EN 61000-4-6 (CS): 150 kHz to 80 MHz: 3 V/m
EN 61000-4-8 (PFMF)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

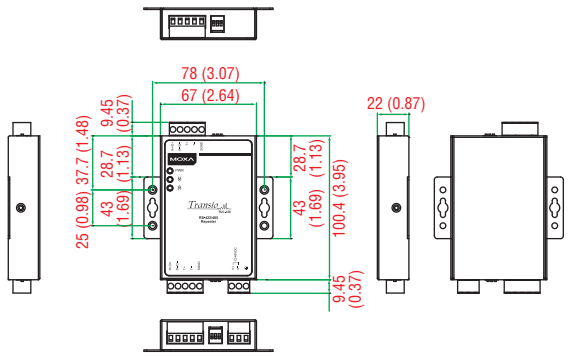
Time: 1,949,025 hrs
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

TCC-120: RS-422/485 converter/repeater
TCC-120I: RS-422/485 converter/repeater with 2 kV optical isolation

Package Checklist

- 1 TCC-120 or TCC-120I media converter
- Power wiring: DBL-JTB-10
- Mounting kit: DK35A
- Quick installation guide (printed)
- Rubber pad

TCC-82

Port-powered RS-232 4-channel isolator

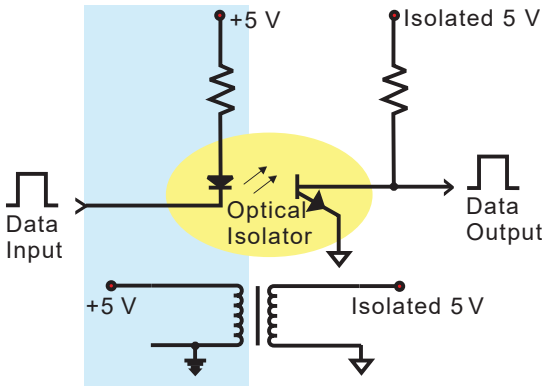
- 4 channels of 4 kV RMS isolation for 1 minute
- External power source supported but not required
- Automatic baudrate detection
- Compact size

USB Power | Port Power | Ext. Power | 4 KV Isolation

RoHS | c UL us LISTED | CE | FC

Introduction

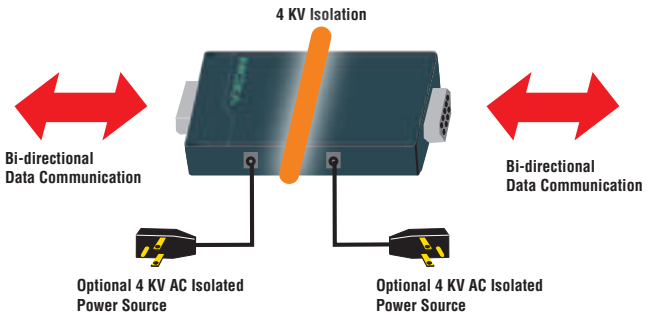
The TCC-82 provides full electrical isolation for bi-directional serial communication between two RS-232 devices in a compact, industrial-grade package. Both sides of an RS-232 connection are isolated optically to provide perfect protection against lightning surges, accidental high-voltage shorts, and ground loops. The built-in, wide range isolators are tested to ensure that they can withstand more than 4 kV rms input to output for 1 minute. This means that the TCC-82 not only meets the requirements of general serial data communications, but also the high standards required by industrial automation and medical applications. The TCC-82 protects the TxD and RxD data lines, and it also protects the RTS and CTS handshake lines for a total of 4 isolated channels to provide complete protection of your RS-232 applications.



External Power Source Not Required

The TCC-82 supports port-powered operation, which means that it can obtain power directly from the attached serial devices. Power is obtained from the RS-232 TxD, RTS, or DTR lines, regardless of whether the signal is high or low, eliminating the need for an external power supply. However, external power can be used if handshake lines are not available, if the serial cable is too long, or if the serial device is a low-power device. For external power, the TCC-82 can use a 5 to 12 VDC adapter or a USB power cord. Note that both sides of the connection are powered independently, so if necessary, one side can rely on port power and the other on an external power source.

When installing the TCC-82, we recommend that you connect all output signals. The TCC-82 obtains power from these signals even if they are not used by your system. Care should be taken when choosing the external power supply if your application requires the full 4 kV of isolation. Most commercial power supplies provide only 1500 VAC isolation between the primary and secondary windings. If you are using external power for both sides of the TCC-82, make sure that separate power sources are used, each with sufficient isolation protection.



Specifications

Serial Communication
Baudrate: 50 bps to 921.6 kbps
Optical Isolation: 4 kV for 1 minute

Serial Interface
Serial Standards:
RS-232: TxD, RxD, RTS, CTS, GND
(Loop-back wiring: DTR to DSR and DCD)
Connector: DB9 male and DB9 female

Physical Characteristics
Housing: ABS
Dimensions: 42 x 80 x 23.6 mm (1.65 x 3.15 x 0.93 in)
Weight: 60 g (0.13 lb)

Environmental Limits
Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -20 to 75°C (-4 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements
Source of Input Power: RS-232 port (TxD, RTS, DTR) or power input jack
Input Voltage: 5 to 12 VDC
Input Current: 20 mA @ 5 VDC

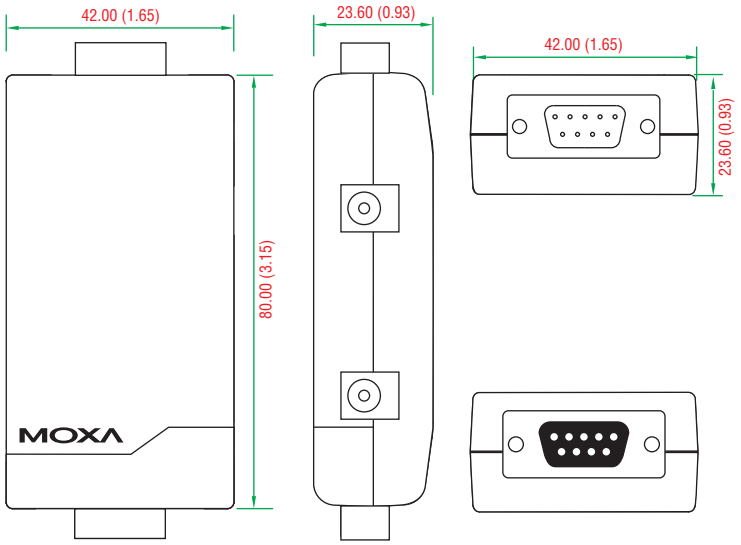
Standards and Certifications
Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
EN 61000-4-2 (ESD): Contact: 4 kV; Air: 8 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 3 V/m
EN 61000-4-4 (EFT): Power: 0.5 kV
EN 61000-4-5 (Surge): Power: 1 kV
EN 61000-4-6 (CS): 150 kHz to 80 MHz: 3 V/m
EN 61000-4-8 (PFMF)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)
Time: 959,780 hrs
Standard: MIL-HDBK-217F

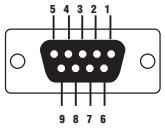
Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

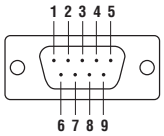


DB9 female connector



PIN	RS-232
1	DCD
2	TxD
3	RxD
4	DSR
5	GND
6	DTR
7	CTS
8	RTS

DB9 male connector



PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

Ordering Information

Available Models
TCC-82: Port-powered RS-232 isolator with 4 kV isolation

Optional Accessories (can be purchased separately)
CBL-F9M9-20: DB9 male to DB9 female RS-232 cable (20 cm)
Note: Additional power adapters can be purchased separately. See Appendix A for details.
Power Adapter: See Appendix A for details

Package Checklist
- 1 TCC-82 RS-232 isolator
- CBL-USBAP-50: USB A male, 2.1 mm DC jack cable, 50 cm
- Quick installation guide (printed)
- Warranty card

ISD-1100-T/1200-T Series

Data line surge protectors

- Plug and play
- Surge protection for serial data lines
  - ISD-1110-T/1130-T: EN 61000-4-5 Level 4
  - ISD-1210-T/1230-T: IEC 61632-21 C2 (20 kV protection)
- Supports RS-232 or RS-422/485
- Compact size for easy installation
- Wide temperature model available for -40 to 85°C environments

Introduction

The ISD-1100-T/1200-T series provides surge protection for serial data lines to prevent damage to devices such as modems, fax machines, I/O ports, terminals, instrumentation, hubs, and any other devices that use serial data connections. The ISD-1100-T/1200-T can add serial data line protection to a variety of serial connections: RS-232, RS-422, and RS-485.

Specifications

Data Line Surge Protection

Maximum Power Protection:
ISD-1110-T/1130-T: 400 watts
ISD-1210-T/1230-T: 5000 watts
Number of Protected Lines:
ISD-1110-T: 7
ISD-1130-T/1210-T/1230-T: 4
Surge Capacity:
ISD-1110-T/1130-T: 4 kV, 8/20 μs impulse per line
ISD-1210-T/1230-T: 20 kV, 8/20 μs impulse per line
Working Voltage:
ISD-1110-T/1210-T: 15 V
ISD-1130-T/1230-T: 5 V
Maximum Load Current:
ISD-1110-T: 0.1 A (23°C), 0.05 A (85°C)
ISD-1130-T: 0.12 A (23°C), 0.07 A (85°C)
ISD-1210-T/1230-T: 0.4 A (20°C), 0.13 A (85°C)
Response Time: < 1 ns
Protection Mode: Line to line, line to ground
Protection Rating: IP30
Bandwidth: 10 MHz loss < 1 dB

Connectors

ISD-1110-T:
Data in: DB9 male
Data out: DB9 female
ISD-1130-T:
Data in: Terminal block
Data out: Terminal block
ISD-1210-T/1230-T:
Data in: Terminal block
Data out: Terminal block

Physical Characteristics

Housing:
ISD-1110-T/1130-T: Plastic
ISD-1210-T/1230-T: Metal
Dimensions:
ISD-1110-T: 53 x 37 x 20.6 mm (2.01 x 1.46 x 0.81 in)
ISD-1130-T: 53 x 37 x 20.6 mm (2.01 x 1.46 x 0.81 in)
ISD-1210-T: 95 x 53 x 25 mm (3.74 x 2.01 x 0.98 in)
ISD-1230-T: 95 x 53 x 25 mm (3.74 x 2.01 x 0.98 in)
Weight:
Product only
ISD-1110-T: 58 g (0.13 lb)
ISD-1130-T: 30 g (0.07 lb)
ISD-1210-T: 214 g (0.47 lb)
ISD-1230-T: 212 g (0.46 lb)
Packaged
ISD-1110-T: 119 g (0.26 lb)
ISD-1130-T: 96 g (0.21 lb)
ISD-1210-T: 276 g (0.61 lb)
ISD-1230-T: 274 g (0.60 lb)

Environmental Limits

Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.
Operating Temperature: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 95% max, non-condensing

Standards and Certifications

EMS:
ISD-1110-T/1130-T: EN 61000-4-5 (Surge): Signal: 4 kV
ISD-1210-T/1230-T: IEC 61643-21 C2 (20 kV 1.2/50, 10 kA 8/20)

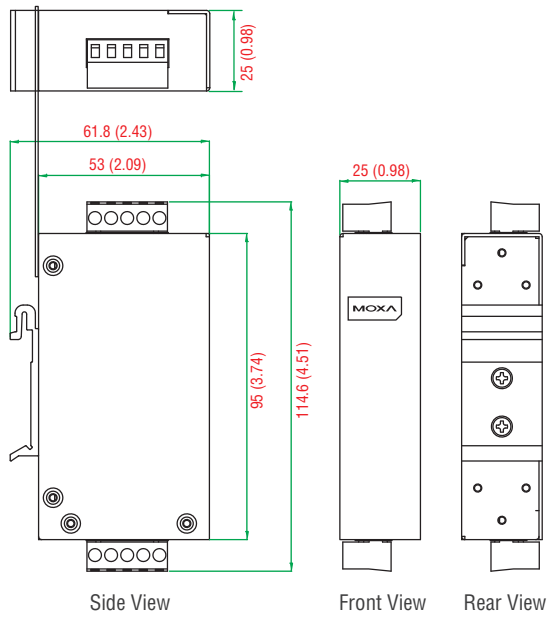
Warranty and RMA Policy

Warranty Period: 5 years (limited to 1-time use)
Warranty Details: See www.moxa.com/warranty
Note: ISD products will only be repaired once within 5 years of purchase. After the first repair, the product's warranty will no longer be valid.
RMA Policy: Moxa does not provide RMA service for ISD products whose PCB board was destroyed by a surge.
Note: Be sure to purchase the ISD product with maximum surge protection suitable for your environment.

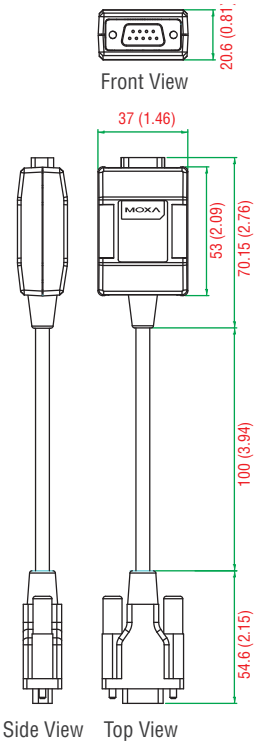
Dimensions

Unit: mm (inch)

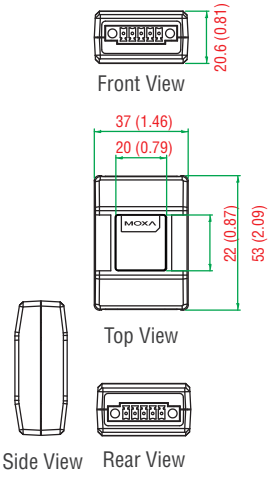
ISD-1210-T/ISD-1230-T



ISD-1110-T



ISD-1130-T



Ordering Information

Available Models

ISD-1110-T: 7 data line entry surge protector, RS-232, 4 kV surge protection, -40 to 85°C operating temperature

ISD-1130-T: 4 data line entry surge protector, RS-422/485, 4 kV surge protection, -40 to 85°C operating temperature

ISD-1210-T: 4 data line advanced surge protector, RS-232, 20 kV surge protection, -40 to 85°C operating temperature

ISD-1230-T: 4 data line advanced surge protector, RS-422/485, 20 kV surge protection, -40 to 85°C operating temperature

Package Checklist

- 1 surge protector
- Hardware installation guide (printed)
- Warranty card

Introduction to CAN-to-Fiber Media Converters

Introduction to CAN

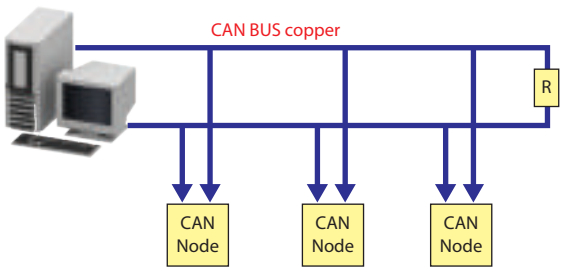
CAN is a serial communications bus defined by the International Standardization Organization (ISO). The CAN serial bus was introduced in 1986 as the "Automotive Serial Controller Area Network," a multimaster message broadcast system that specifies a maximum signaling rate of 1 Mbps. It was soon discovered that CANbus worked extremely well for many other applications, including weaving machines, elevator systems in large buildings, ships, trains, aircraft, X-ray machines and other medical equipment, logging equipment, tractors and combines, coffee makers, and major appliances. CAN systems are extremely versatile. Technicians find it easy to repair or replace computer hardware in a CAN system without affecting the rest of the network in any way, and design engineers can easily modify existing CAN systems for other uses by adding or remove network nodes.

Why CAN-to-Fiber Media Converters?

Many applications require connecting large numbers of CAN devices in a complex environment. However, since there is a limit to the driving capability of CANbus, users may not be able to set up as many CAN devices as they would like. In addition, variations in the allowed segment lengths, which result from the fact that different types of wire are used, pose additional limitations. Note that device numbers and segment lengths are dictated by the ISO 11898-2 standard.

CAN converters are used to get around the limitation on the number of CAN devices and the upper limit of segment lengths. Most installers use optical fiber to extend to longer transmission distances since the fiber will not corrupt the CANbus signal. CAN-to-fiber converters not only can solve the problem of extending transmission distance, but will also guarantee more secure data transmission and will not limit the number of CAN devices that can be used. The ICF-1170I is a CAN-to-fiber converter that secures data transmission by using fiber optic transmission to provide complete isolation and protection against EMI. The ICF-1170I series can separate and protect critical segments of the system from the rest of the CAN network and is protocol-independent, allowing it to work with all of the different CAN protocols and frame lengths.

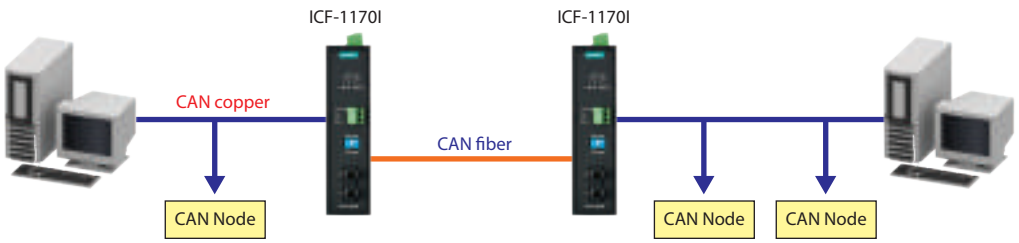
Typical Installation



Overview of the ICF-1170I CAN-to-Fiber Converter

The ICF-1170I series CAN-to-fiber converters provide secures data transmission by using fiber-optic transmission to provide complete isolation and protection against EMI. The ICF-1170I series can separate and protect critical segments of the system from the rest of the CAN network and is protocol-independent, allowing it to work with all of the different CAN protocols and frame lengths.

Typical CAN application that uses a CAN-to-fiber converter



Special Features

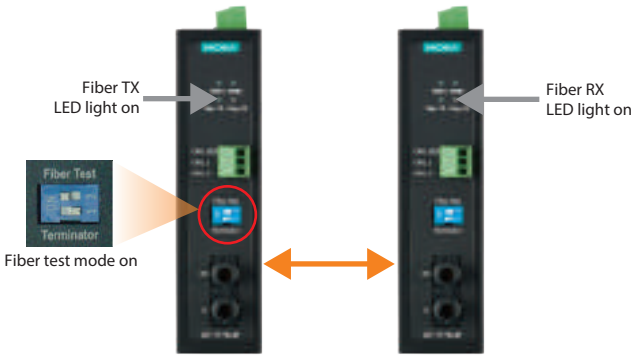
Fiber Test Mode

The ICF-1170I supports a special feature called Fiber Test Mode, which is easily activated with a DIP switch on the ICF-1170I's outer panel. Fiber Test Mode can be used to test the fiber cable between two ICF-1170I units and provides a simple way to determine if the fiber cable is transmitting data correctly.

When in Fiber Test Mode, the fiber transceiver (TX) will continuously send out a data signal and the "Fiber TX" LED will light up. On the other side of the connection, when the ICF-1170I fiber transceiver (RX) receives the data signal from the TX side, the "Fiber RX" LED will light up.

If both the "Fiber TX" and "Fiber RX" LEDs light up at the same time, it means the fiber transmission between the two converters is okay, and the fiber cable is connected properly. If the test fails, you should check the fiber cable and fiber connectors to determine the cause of the transmission error.

Fiber-optic communication is working properly when both the TX and RX LEDs light up.



Redundant Power

To help ensure that your system works nonstop, the ICF-1170I CAN-to-fiber converter comes with a built-in redundant power input that is activated automatically when the primary power input fails. In addition, an alarm contact will be activated when the redundant power input is activated.

Isolation Protection

A special feature of the ICF-1170I CAN-to-fiber converter is its 2 kV isolation protection to protect the converter in environments with high electromagnet activity.

ICF-1170I Series

Industrial CAN-to-fiber converters

- Transmits up to 2 km over optical fiber
- Converts CAN signals to fiber and fiber to CAN signals
- Baudrate up to 1 Mbps
- Dual power inputs for redundancy
- DIP switch for 120 ohm terminal resistance
- DIP switch for fiber test mode
- LEDs for Fiber TX, Fiber RX, Power 1, Power 2
- Wide temperature model available for -40 to 85°C environments
- Fully compatible with the ISO 11898 standard

15 KV ESD

Introduction

The ICF-1170I series CAN-to-fiber converters are used to convert CAN signals from copper to optical fiber. The converters come with 2 kV optical isolation for the CANbus system and dual power inputs with alarm contact relay to ensure that your CANbus system will remain online.

Fiber Test Mode

Fiber Test Mode can be used to test the fiber cable between two ICF-1170I units, and it provides a simple way to determine if the fiber cable is transmitting data correctly. When in Fiber Test Mode, the fiber transceiver (TX) will continuously send out a data signal and the "Fiber TX" LED will light up. On the other side of the connection, when the ICF-1170I fiber transceiver (RX) receives the data signal from the TX side, the "Fiber RX" LED will light up.

Specifications

CAN Communication

CAN Interface: ISO 11898-2, Terminals (CAN_H, CAN_L,CAN_GND)
Protocols: CAN 2.0A and 2.0B (ISO 11898-2)
Connector Type: 3-pin removable screw terminal x1
Termination Resistor: Dip switch selector for 120 Ω terminal resistor
Transfer Rate: Up to 1 Mbps
System Delay: 150 ns
Isolation Protection: 2 kV
Transmission Distance: Max 2 km (depends on the data rate and the protocol used)
Note: The transmission distance is limited by the signal rate, as indicated in the ISO 11898-2 standard.
LED Indicators: PWR1, PWR2, Fiber TX, Fiber RX

Fiber Communication

Connector Type: ST (multi-mode) fiber ports
Fiber Cable Requirements:

Low-Speed Fiber Module		Multi-Mode
Fiber Cable Requirements		50/125 µm, 800 MHz
		62.5/125 µm, 500 MHz
Typical Distance		5 km
Wave-length	Typical (nm)	850
	TX Range (nm)	840 to 860
	RX Range (nm)	800 to 900
Optical Power	TX Range (dBm)	0 to -5
	RX Range (dBm)	0 to -20
	Link Budget (dB)	15
	Dispersion Penalty (dB)	1

Physical Characteristics

Housing: Metal
Dimensions: 30.3 x 70 x 115 mm (1.19 x 2.76 x 4.53 in)
Weight: 178 g (0.39 lb)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC dual power for redundant power
Input Current:
ICF-1170I: 221 mA @ 12 VDC
Alarm Contact: 1 relay output with current-carrying capacity of 1 A @ 24 VDC
Voltage Reversal Protection: Protects against V+/V- reversal
Overcurrent Protection: 1.1 A (protects against two signals shorted together)

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
EN 61000-4-2 (ESD): Contact: 8 kV; Air: 15 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 3 V/m
EN 61000-4-4 (EFT): Power: 4 kV; Signal: 2 kV
EN 61000-4-5 (Surge): Power: 2 kV; Signal: 1 kV
EN 61000-4-6 (CS): 150 kHz to 80 MHz: 3 V/m
EN 61000-4-8 (PFMF)
Green Product: RoHS, CRoHS, WEEE
Freefall: IEC 60068-2-32

MTBF (mean time between failures)

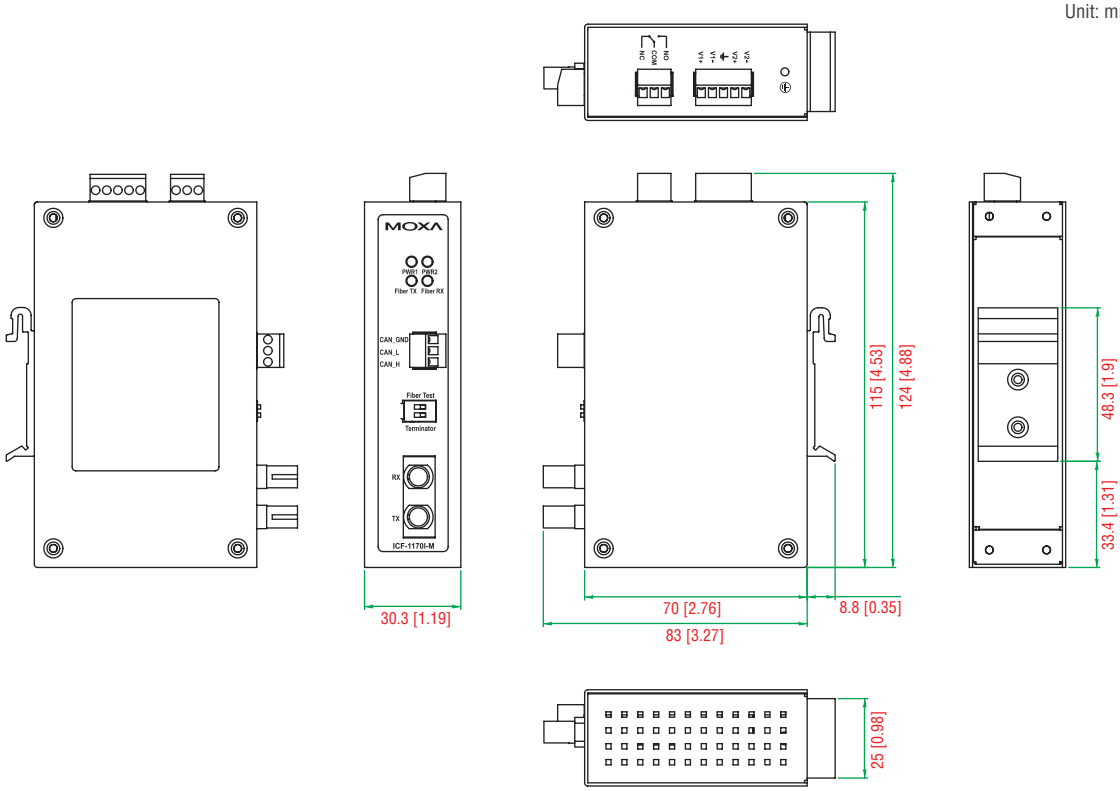
Time: 792,085 hrs
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

ICF-1170I-M-ST: CAN-to-fiber converter, multi-mode, ST connector, 0 to 60°C
ICF-1170I-M-ST-T: CAN-to-fiber converter, multi-mode, ST connector, -40 to 85°C

Package Checklist

- 1 ICF-1170I CAN-to-fiber converter
- Quick installation guide (printed)
- Warranty card

ICF-1180I/1280I Series

Industrial PROFIBUS-to-fiber converters with redundant fiber ring

- Redundant fiber ring with zero recovery time
- Examine network-wide fiber communication from a single converter
- Auto baudrate detection and data speed up to 12 Mbps
- PROFIBUS Bus Fail prevents corrupted datagram in functioning segment
- Alarm by relay output
- 2 kV galvanic isolation protection
- Dual-power inputs for redundancy
- Extends PROFIBUS transmission distance up to 45 km
- Wide temperature range model available for -40 to 75°C environments
- Supports Fiber Signal Intensity Diagnosis
- Fiber inverse feature (ICF-1180I)
- Fiber cable test function validates fiber communication

Fiber Ring

Overview

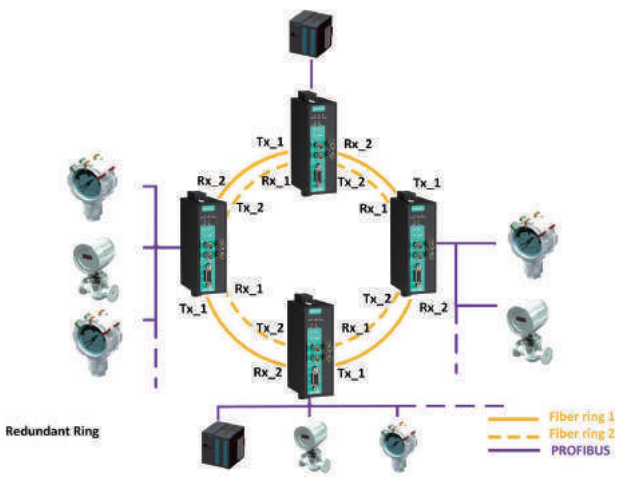
The ICF-1180I/1280I series industrial PROFIBUS-to-fiber converters are used to convert PROFIBUS signals from copper to optical fiber. The converters are used to extend serial transmission up to 4 km (multi-mode fiber) or up to 45 km (single-mode fiber). The ICF-1180I/1280I provides 2 kV isolation protection for the PROFIBUS system and dual-power inputs to ensure that your PROFIBUS device will perform uninterrupted.

Remote Fiber Diagnosis

Optical-fiber cables are often deployed for long distance communication, and a fiber optic inspection pen is used by engineers to ensure proper communication quality of the fiber cable. The ICF-1180I/1280I series converters eliminate the need for a fiber-optic inspection pen by providing a Remote Fiber Diagnosis function that uses DIP switch adjustments. There are two major functions provided by Remote Fiber Diagnosis: (1) determining which side (Tx or Rx) is causing the problem on the converter; (2) examining the fiber connections for the overall topology from any individual converter. Fiber cable abnormalities can be automatically detected and identified by the LED indicator even if it is not adjacent to the converter. Remote Fiber Diagnosis facilitates fiber cable deployment and management, and also significantly shortens troubleshooting time by examining fiber connections for the overall topology from any individual converter.

Redundant Ring

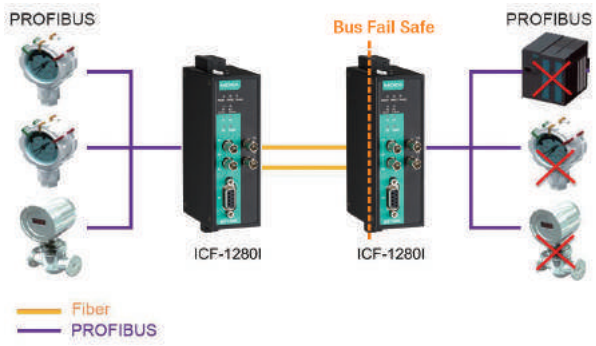
The ICF-1280I series converters can connect PROFIBUS devices in a redundant fiber ring topology. Use the DIP switch to configure all the ICF- 1280I converters to Redundant Ring mode. When a PROFIBUS master transmits a signal from one converter to the PROFIBUS slave devices, this signal will travel to all the converters around the ring until it returns to the original converter and terminate. The redundant ring structure ensures no packet loss with zero recovery time.



Redundant Ring

PROFIBUS Fail Safe

Electrical noise may be generated when a PROFIBUS device malfunctions or the serial interface fails, resulting in bus failure. Traditional media converters transmit noise signals through the fiber wire to the other converter. This not only disrupts data communication between the two buses, but will also bring communication across the entire system to a halt. When this occurs, the engineers will not be able to easily locate the failed device because the entire PROFIBUS network is down. To avoid this situation, the ICF-1180I/1280I series converter has a mechanism to detect and recognize noise signals. If the bus fails on one side, the noise signal will not propagate through the ICF-1180I/1280I converter and affect additional bus segments. In addition, the ICF-1280I converter will also trigger an alarm to provide the location of the failure to the field engineer.



Auto/Manual Baudrate Settings

The ICF-1180I/1280I series converters simply convert the signal back and forth between PROFIBUS and fiber at baudrates between 9.6 Kbps to 12 Mbps. Engineers do not need to know the baudrate of the connected PROFIBUS device; the ICF-1180I/1280I series converters can automatically detect the baudrate of the PROFIBUS device and apply this baudrate directly. This is an extremely convenient feature. If necessary, baudrates can be set to a fixed value via DIP switches to shorten the baudrate detection period when the system initializes.

Fiber Link Monitor

The ICF-1180I/1280I series converter provides a fiber link monitoring function to detect the communication errors on both sides of the fiber connection and determine which side (Tx or Rx) is causing the problem. When a communication error occurs, a red LED status indicator will turn on and the relay alarm will activate.

If a fiber abnormality occurs in a remote fiber segment, the Fault LED will flash to indicate the abnormality is happening in the remote segment. Engineers can use the fiber test function for troubleshooting.

Fiber Signal Intensity Diagnosis

In some circumstances, you may need to measure the receive level of the fiber-optic port with a voltmeter, which can be connected while the device is operating (doing so will not affect data transmission). The measurement can be taken with a voltmeter and read on a PLC that uses floating high-impedance analog inputs, which allows you to do the following:

1. Record the incoming optical power for later measurement (e.g., to indicate aging or damage).
2. Carry out a good/bad test (limit value).

Specifications

Technology

Standards: IEC 61158-2 for PROFIBUS DP

Interface

P1/P2/P3 Ports:
ICF-1180I:
P1 port: ST optical fiber
P2 port: PROFIBUS DP (DB9 female)
ICF-1280I:
P1/P2 ports: ST optical fiber
P3 port: PROFIBUS DP (DB9 female)
Relay Alarm: One relay output with current-carrying capacity of 2 A @ 30 VDC (Normal open)
LED Indicators: PWR1, PWR2, Ready, P1, P2, P3, Fault
DIP Switches:
DIPs 1 to 4: Baudrate setting
DIP 5: Fiber link monitor
ICF-1180I:
DIP 6: Fiber Inverse function
DIP 7: Reserved
DIP 8: Remote Fiber Diagnosis
ICF-1280I:
DIPs 6 to 7: Linear/Star mode (w/ optional P1/P2 disabled), Redundant Ring mode
DIP 8: Remote Fiber Diagnosis

PROFIBUS Communication

Data Rate: 9.6, 19.2, 45.45, 93.75, 187.5, 500, 1500, 3000, 6000, and 12000 Kbps
Auto Baudrate: Yes
Isolation Protection: 2 kV

Optical-Fiber Side

Point-to-Point, Linear (Bus), Star, Redundant Topologies:

Low-Speed Fiber Module		Multi-Mode
Fiber Cable Requirements		50/125 µm, 800 MHz
		62.5/125 µm, 500 MHz
Typical Distance		5 km
Wave-length	Typical (nm)	850
	TX Range (nm)	840 to 860
	RX Range (nm)	800 to 900
Optical Power	TX Range (dBm)	0 to -5
	RX Range (dBm)	0 to -20
	Link Budget (dB)	15
	Dispersion Penalty (dB)	1

Physical Characteristics

Housing: Metal
Mounting: DIN rail, wall (with optional kit)
Dimensions:
ICF-1180I: 30.3 x 115 x 70 mm (1.19 x 4.53 x 2.76 in)
ICF-1280I: 39 x 115 x 70 mm (1.54 x 4.53 x 2.76 in)
Weight:
ICF-1180I: 180 g (0.39 lb)
ICF-1280I: 225 g (0.49 lb)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current:
ICF-1180I: 221 mA @ 12 VDC
ICF-1280I: 315 mA @ 12 VDC
Connector: Terminal Block
Power Line Protection: Level 3 (2 kV) Surge Protection
Overcurrent Protection: 1.1 A

Standards and Certifications

Safety: UL 508
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2 EEx nC IIC, IECEx
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
EN 61000-4-2 (ESD): Contact: 6 kV; Air: 8 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 10 V/m
EN 61000-4-4 (EFT): Power: 2 kV; Signal: 2 kV
EN 61000-4-5 (Surge): Power: 2 kV; Signal: 2 kV
EN 61000-4-6 (CS): 150 kHz to 80 MHz: 10 V/m
EN 61000-4-8 (PFMF)
Green Product: RoHS, CRoHS, WEEE
Freefall: IEC 60068-2-32

MTBF (mean time between failures)

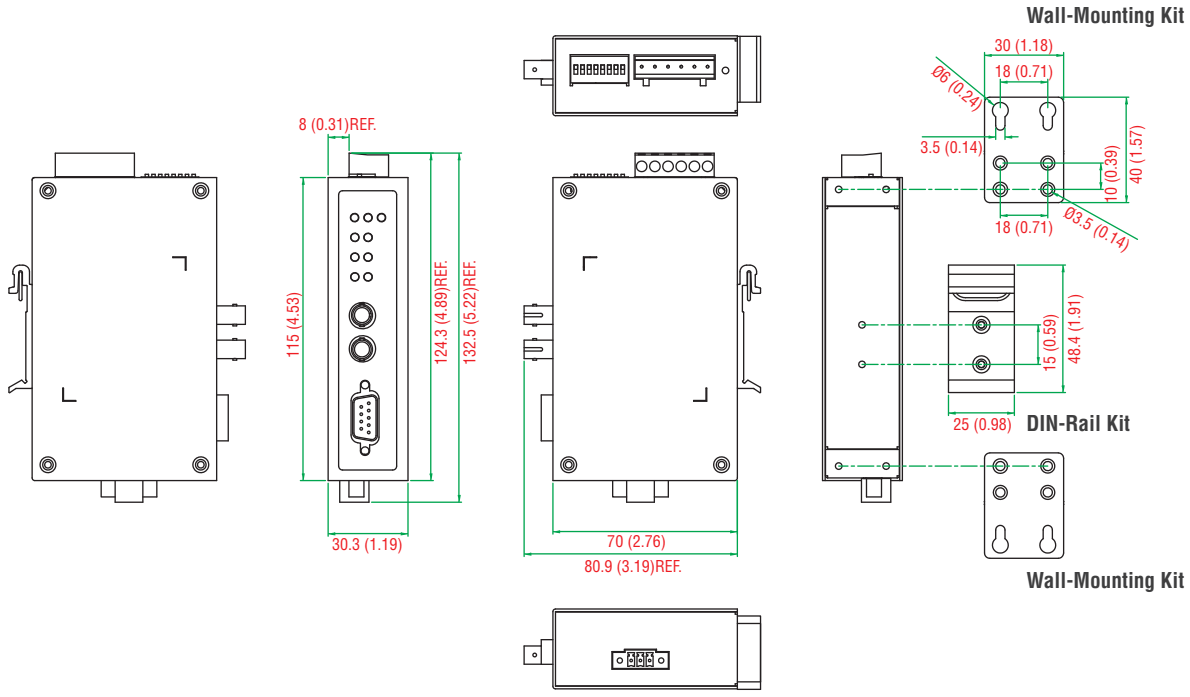
Time:
ICF-1180I: 1,870,854 hrs
ICF-1280I: 1,567,875 hrs
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

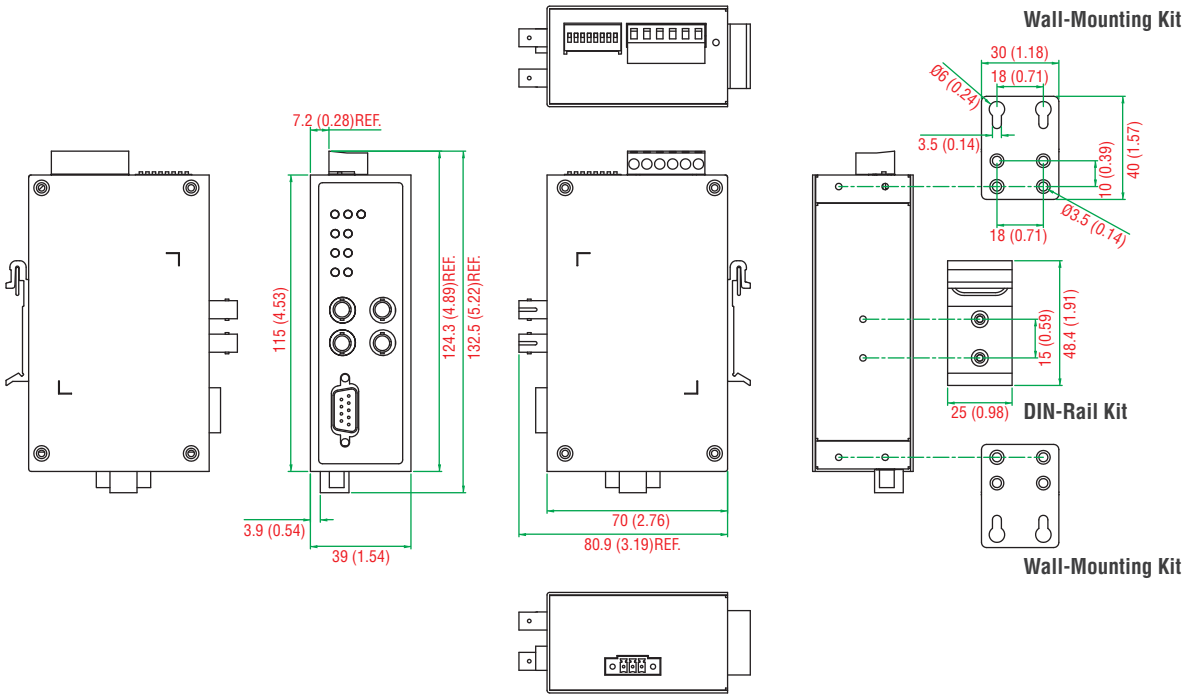
ICF-1180I Dimensions

Unit: mm (inch)



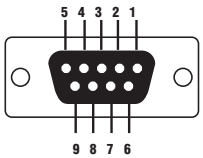
ICF-1280I Dimensions

Unit: mm (inch)



Pin Assignment

PROFIBUS Connector (DB9 Female)



PIN	Signal Name
1	N–C
2	N–C
3	Profibus D+
4	RTS
5	Signal common
6	5 V
7	N–C
8	Profibus D-
9	N–C

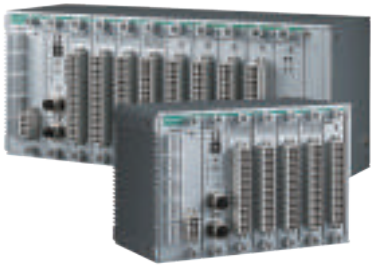
Ordering Information

Available Models

ICF-1180I-M-ST: PROFIBUS to fiber converter, multi-mode, ST connector, 0 to 60°C
ICF-1180I-S-ST: PROFIBUS to fiber converter, single-mode, ST connector, 0 to 60°C
ICF-1180I-M-ST-T: PROFIBUS to fiber converter, multi-mode, ST connector, -40 to 75°C
ICF-1180I-S-ST-T: PROFIBUS to fiber converter, single-mode, ST connector, -40 to 75°C
ICF-1280I-M-ST: PROFIBUS to fiber converter, multi-mode, 2 ST connector, 0 to 60°C
ICF-1280I-S-ST: PROFIBUS to fiber converter, single-mode, 2 ST connector, 0 to 60°C
ICF-1280I-M-ST-T: PROFIBUS to fiber converter, multi-mode, 2 ST connector, -40 to 75°C
ICF-1280I-S-ST-T: PROFIBUS to fiber converter, single-mode, 2 ST connector, -40 to 75°C

Package Checklist

- ICF-1180I/1280I series PROFIBUS-to-fiber converter
- Hardware installation guide (printed)
- Warranty card



Programmable RTU Controllers

Product Selection Guide

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Modular Programmable RTU Controllers

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Standalone Programmable RTU Controllers

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15

Programmable RTU Controllers

Modular and Compact RTU Controllers

Preliminary

	ioPAC 8600 series	ioPAC 8500 Series	ioPAC 8020 Series	ioPAC 5542 Series
Inputs/Outputs				
Digital Inputs	–	–	–	8
Configurable DIOs	–	–	–	8
Analog Inputs	–	–	–	8
Cellular				
HSPA	–	–	–	✓ (ioPAC 5542-HSPA)
Ethernet				
Ports (Connector)	2 (M12 or RJ45)			2 (RJ45)
Speed	10/100 Mbps			
Switch (Daisy Chain)	✓	–	✓	–
2 MACs	✓	✓	–	✓
Protocols	Modbus TCP (master/slave), SNMP, TCP/IP, UDP, DHCP, BOOTP, SNTP, SMTP		Modbus TCP (master/slave), TCP/IP, UDP, DHCP, BOOTP, SNTP, SMTP	Modbus TCP (master/slave), SNMP, TCP/IP, UDP, DHCP, BOOTP, SNTP, SMTP
Serial				
Ports (Connector)	–	2 (DB9 male)	1 (DB9 male)	2 (DB9 male)
Interface	–	RS-232/422/485		
Protocols	Modbus RTU (master/slave)		Modbus RTU (master)	Modbus RTU (master/slave)
Physical Characteristics				
I/O Module Slots	5/9/12	2/5/9	5/9	–
Environmental Limits				
Operating Temperature	-40 to 75°C (-40 to 176°F)			-40 to 75°C (-40 to 176°F) -30 to 75°C (-22 to 176°F) for HSPA model
Storage Temperature	-40 to 85°C (-40 to 185°F)			
Ambient Relative Humidity	5 to 95% RH (non-condensing)			
Shock	IEC 60068-2-27			
Vibration	IEC 60068-2-6			
Software				
Programmability	C/C++, IEC 61131-3		C/C++	C/C++, IEC 61131-3
MX-AOPC UA Server	✓	✓	✓	✓
Active OPC Server	–	✓	✓	✓
DA Center	–	✓	✓	✓
RTUxpress	✓		–	✓
RTUAdmin	–	–	✓	–
Standards and Certifications				
Safety	UL 508			
EMC	EN 55022, EN 55024			
EMI	FCC Part 15 Subpart B Class A, CISPR 22			
EMS	IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8			
Radio	–	–	–	NCC (ioPAC 5542-HSPA)
Rail Traffic	EN 50155 (essential compliance*), EN 50121-3-2, EN 50121-4	EN 50155**, EN 50121-3-2, EN 50121-4		EN 50121-4
Hazardous Location	–	–	–	Class 1 Division 2
Reliability				
Warranty	5 years			
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*Moxa defines “essential compliance” to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
**Complies with a portion of EN 50155 specifications.

I/O Modules for the ioPAC 8600 Series

Preliminary

	Digital Input		Digital Output		Analog Output	Communication	
	86M-1620D-T	86M-1832D-T	86M-2830D-T	86M-2604D-T	86M-4420-T	86M-5212U-T	86M-5250-T
Module Properties							
Channels/Ports (Connector)	16 (terminal block)	8 (terminal block)	8 (terminal block)	6 (terminal block)	4 (terminal block)	2 (M12)	2 (DB9 male)
Input/Output Mode	24 to 110 VDC	24 VDC ch-to-ch isolation	24 VDC ch-to-ch isolation	Relay	0 to 10 V -10 to 10 V 0 to 20 mA 4 to 20 mA	–	–
Type	sink	sink/source	sink	Form A (N.O.)	–	–	–
Communication Ports	–	–	–	–	–	2-wire Ethernet	CAN
Standards	–	–	–	–	–	100BASE-TX IEEE 802.3u 10BASE-T IEEE 802.3 100 Mbps BroadR-Reach® 10 Mbps BroadR-Reach®	CAN 2.0A CAN 2.0B CANopen DS301 CANopen DS401
Enviromental Limits							
Operating Temperature	-40 to 75°C (-40 to 176°F)						
Storage Temperature	-40 to 85°C (-40 to 185°F)						
Ambient Relative Humidity	5 to 95% RH (non-condensing)						
Reliability							
Warranty	5 years (see www.moxa.com/warranty)						

I/O Modules for the ioPAC 8500 Series

	Digital Input	Digital Output	Analog Input				High Speed Analog Input		Communication
	85M-1602-T	85M-2600-T	85M-3800	85M-3801	85M-6600-T	85M-6810-T	85M-3801-T	85M-3811-T	85M-5401-T
Module Properties									
Channels/Ports (Connector)	16 (terminal block)	16 (terminal block)	8 (terminal block)	8 (terminal block)	6 (terminal block)	8 (terminal block)	8 (terminal block)	8 (terminal block)	4 (DB44 female)
Input/Output Mode	24 VDC	24 VDC	4 to 20 mA	0 to 10 V	RTD	Thermocouple	4 to 20 mA	0 to 10 V	–
Type	sink/source	sink	–	–	–	–	–	–	–
Sampling Rate	–	–	All channels: 100 samples/sec Per channel: 12.5 samples/sec	All channels: 100 samples/sec Per channel: 12.5 samples/sec	All channels: 12 samples/sec Per channel: 2 samples/sec	All channels: 12 samples/ sec Per channel: 1.5 samples/sec	All channels: 40k samples/sec Per channel: 5k samples/sec	All channels: 40k samples/sec Per channel: 5k samples/sec	–
Serial Ports	–	–	–	–	–	–	–	–	RS-232/422/485
Environmental Limits									
Operating Temperature	-40 to 75°C (-40 to 176°F)								
Storage Temperature	-40 to 85°C (-40 to 185°F)								
Ambient Relative Humidity	5 to 95% RH (non-condensing)								
Reliability									
Warranty	5 years (see www.moxa.com/warranty)								

Note: 85M modules can also be used with ioPAC 8600 systems.

I/O Modules for the ioPAC 8020 Series

	Digital Input		Digital Output	Analog Input		Communication
	RM-1050-T	RM-1602-T	RM-2600-T	RM-3802-T	RM-3810-T	KM-2430-T
Module Properties						
Channels/Ports (Connector)	10 (terminal block)	16 (terminal block)	16 (terminal block)	8 (terminal block)	8 (terminal block)	4 (M12)
Input/Output Mode	110 VDC ch-to-ch isolation	24 VDC	24 VDC	4 to 20 mA	0 to 10 VDC	–
Type	sink/source	sink/source	sink	–	–	–
Communication Ports	–	–	–	–	–	Unmanaged Ethernet switch
Standards	–	–	–	–	–	IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT(X) IEEE 802.3x for Flow Control
Environmental Limits						
Operating Temperature	-40 to 75°C (-40 to 176°F)					
Storage Temperature	-40 to 85°C (-40 to 185°F)					
Ambient Relative Humidity	5 to 95% RH (non-condensing)					
Reliability						
Warranty	5 years (see www.moxa.com/warranty)					

ioPAC 8600 Series

Preliminary

Rugged modular RTU controllers

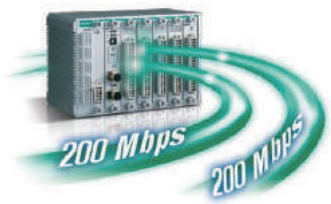
- Modular CPU/Power/Backplane/IO design supporting ioPAC 8500/8600 series I/O modules
- Supports dual power module with dual power inputs
- Supports C/C++ or IEC 61131-3 programming languages with ready-to-run services
- 24 to 110 V power input range and DI/O modules
- Compliant with EN 50121-3, EN 50121-4, and EN 50155 specifications

EN 50155 c UL us LISTED RoHS EN 50121 CE FC

Overview

The ioPAC 8600 modular RTU controllers are 100% modular, giving users the freedom to choose CPU, power, backplane, communication, and I/O modules. In addition, the ioPAC 8600 enhances the hardware system architecture and key features of the ioPAC 8020 and ioPAC 8500 combined. It also adds an Ethernet bus on the backplane to support Ethernet switch modules. The ioPAC 8600 supports the C/C++ and IEC 61131-3 programming languages and ready-to-run services, including Modbus TCP/RTU, SNMP, data logging, and email alarms to fulfill different customers' requirements. With active tag and MX-AOPC data integration software, the ioPAC 8600 series provides a comprehensive solution for data acquisition and control applications in harsh environments.

2-Wire Ethernet Technology



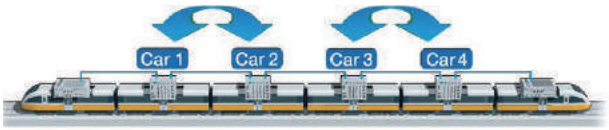
Moxa's 2-wire Ethernet technology offers system integrators an attractive option for upgrading the train's IP network to a 10/100 Mbps* Ethernet backbone with existing 2-wire cable. This innovative 2-wire Ethernet technology supports Ethernet bypass functionality, ensuring that the Ethernet backbone will continue to operate even if one ioPAC is without power. As an added plus, with two 2-wire Ethernet modules in one ioPAC, the network can reach 200 Mbps and provide a redundant architecture.

*Network performance is related to cable quality when using 2-wire technology.

Ready-to-Run Service

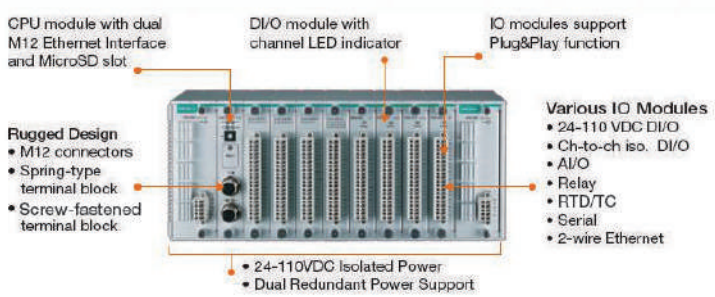
Moxa's ioPAC 8600 programmable controllers allow programmers to rapidly configure services (SNMP, Modbus RTU/TCP, E-mail alarm service, etc.) without writing any programs. The ioPAC can reduce the configuration of massively distributed deployments to a few simple mouse clicks, greatly increasing an engineer's productivity.

Automatic Carriage Sequencing (ACS)



Moxa's Automatic Carriage Sequencing technology quickly and automatically resets the train car sequence, without disrupting network transmissions within the train. This technology greatly reduces the operation effort required for trains that frequently rearrange consists. Onboard passenger information systems can also adjust immediately when changes are made.

Compact Integrated Solution



The compact ioPAC 8600 is equipped with universal dual-power inputs that support all railway power voltages, and new channel-to-channel, wide voltage DI/DO modules are available for use in trains that use different power systems. The ioPAC 8600 supports a variety of communication interfaces, including Ethernet, serial, CAN, and MVB*. System integrators can control or monitor sub-systems with the ioPAC 8600, which saves space and has powerful functions to reduce both the system integrator's budget and installation difficulties.

*MVB available by project request.

Specifications

Power Requirements

Input Voltage: 24 to 110 VDC

Physical Characteristics

Housing: Aluminum

Dimensions:

• 5-slot version: 205.65 x 133.35 x 100 mm (8.1 x 5.25 x 3.94 in)
• 9-slot version: 324.8 x 133.35 x 100 mm (12.79 x 5.25 x 3.94 in)

Weight:

• 5-slot version: 2560 g (5.64 lb)
• 9-slot version: 3690 g (8.14 lb)

Mounting: DIN rail (optional), wall (optional), rack (optional)

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 176°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
Altitude: Up to 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: FCC Part 15 Subpart B Class A, CISPR 22
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS:
80 MHz to 1000 MHz: 3 V/m
1400 MHz to 2100 MHz: 3 V/m
2100 MHz to 2700 MHz: 1 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge:
Power: 2 kV (L-PE), 1 kV (L-L);
Signal: 2 kV (L-PE), 1 kV (L-L)
IEC 61000-4-6 CS: 3 V
IEC 61000-4-8 PFMF: 3 A/m
Rail Traffic: EN 50155 (essential compliance*), EN 50121-3-2, EN 50121-4
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
Note: Please check Moxa's website for the most up-to-date certification status.

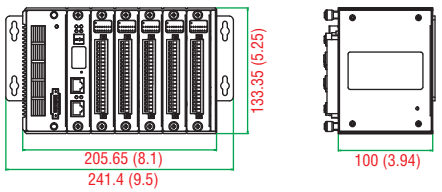
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

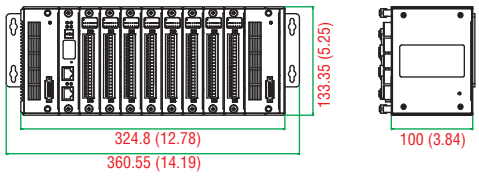
Dimensions

Unit: mm (inch)

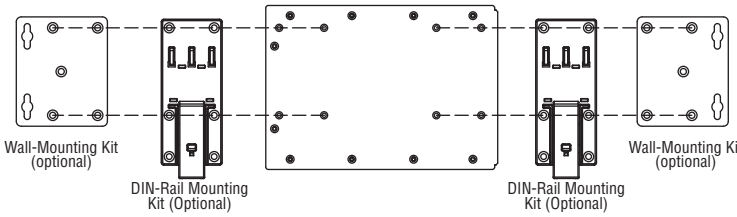
ioPAC 8600 with 5 I/O slots



ioPAC 8600 with 9 I/O slots



Mounting Kits



Ordering Information

CPU Modules

ioPAC 8600-CPU10-M12-C-T: ioPAC 8600 CPU module, C/C++ programmable controller, M12 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8600-CPU10-RJ45-C-T: ioPAC 8600 CPU module, C/C++ programmable controller, RJ45 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8600-CPU10-M12-IEC-T: ioPAC 8600 CPU module, IEC 61131-3 programmable controller, M12 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8600-CPU10-RJ45-IEC-T: ioPAC 8600 CPU module, IEC 61131-3 programmable controller, RJ45 Ethernet ports, -40 to 75°C operating temperature

Power Modules

ioPAC 8600-PW10-15W-T: ioPAC 8600 power module, dual power input, 24 to 110 VDC, 15W, -40 to 75°C operating temperature

Backplane Modules

ioPAC 8600-BM005-T: ioPAC 8600 backplane module with 5 slots, -40 to 75°C operating temperature
ioPAC 8600-BM009-T: ioPAC 8600 backplane module with 9 slots, -40 to 75°C operating temperature

I/O Modules (can be purchased separately)

86M-1620D-T: 16 DIs, sink, 24 to 110 VDC, channel LED, -40 to 75°C operating temperature
86M-1832D-T: 8 DIs, sink/source, 24 VDC, ch-to-ch isolation, channel LED, -40 to 75°C operating temperature
86M-2604D-T: 6 relays, form A (N.O.), channel LED, -40 to 75°C operating temperature
86M-2830D-T: 8 DOs, sink, 24 VDC, ch-to-ch isolation, channel LED, -40 to 75°C operating temperature
86M-4420-T: 4 AOs, 0 to 10 V, -10 to 10 V, 0 to 20 mA, or 4 to 20 mA, -40 to 75°C operating temperature
86M-5212U-T: 2-port 2-wire Ethernet switch, -40 to 75°C operating temperature
86M-5250-T: 2 CAN ports, -40 to 75°C operating temperature
85M-1602-T: 16 DIs, sink/source, 24 VDC, dry contact, -40 to 75°C operating temperature
85M-2600-T: 16 DOs, sink, 24 VDC, -40 to 75°C operating temperature
85M-3800-T: 8 AIs, 4 to 20 mA, 16 bits, -40 to 75°C operating temperature
85M-3810-T: 8 AIs, 4 to 20 mA, 16 bits, 40 kHz, -40 to 75°C operating temperature
85M-3801-T: 8 AIs, 0 to 10 VDC, 16 bits, -40 to 75°C operating temperature
85M-3811-T: 8 AIs, 0 to 10 VDC, 16 bits, 40 kHz, -40 to 75°C operating temperature
85M-5401-T: 4 serial ports (RS-232/422/485 3-in-1), -40 to 75°C operating temperature
85M-6600-T: 6 RTDs, -40 to 75°C operating temperature
85M-6810-T: 8 TCs, -40 to 75°C operating temperature
Note: Both 86M modules and 85M modules can be used with the ioPAC 8600 series.
Note: Conformal coating available on request.

Optional Accessories (can be purchased separately)

DK-DC50131-01: DIN-rail mounting kit, 50 x 131 mm
WK-75: Wall-mounting kit, 2 plates with 8 screws
CBL-M12D(MM4P)/RJ45-100 IP67: 4-pin D-code M12-to-RJ45 CAT5E UTP Ethernet cable, 100 cm, IP67 waterproof
CBL-RJ458P-100: 8-pin RJ45 CAT5 Ethernet cable, 100 cm
CBL-F9DPF1x4-BK-100: Serial console cable
CBL-M44M9x4-50: DB44 to 4-port DB9 female serial cable
85M-BKTES: Empty slot covers (3 per order)

Package Checklist (CPU Module)
- ioPAC 8600 CPU module
- Serial console cable (C/C++ version only)
- Documentation and software CD

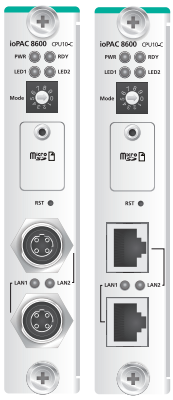
Package Checklist (Power Module)
- ioPAC 8600 power module

Package Checklist (Backplane Module)
- ioPAC 8600 backplane module

Package Checklist (I/O Module)
- 85M/86M module
- Serial cable: CBL-M44M9x4-50 (85M-5401-T only)

ioPAC 8600 Series Modules Preliminary

ioPAC 8600-CPU10 Series: 32-bit ARM9 192 MHz CPU



Computer
CPU Type: 32-bit ARM9 192 MHz CPU
OS: Linux
Clock: Real-time clock with super capacitor (retains charge for 7 days)

Memory
SDRAM: 64 MB
Flash: 32 MB (10 MB reserved for user)
FRAM: 128 KB
microSD™ Slot: Up to 32 GB (SD 2.0 compatible)
Note: For units operating in extreme temperatures, industrial-grade, wide-temperature microSD cards are required.

Switches & Buttons
Rotary Switch: 0 to 9
Button: Reset to factory defaults

Ethernet Interface
LAN: 2 x 10/100 Mbps, Ethernet bypass or 2 MACs (IPs), jumper selectable, RJ45 or M12
Protection: 1.5 kV magnetic isolation
Automation Languages: C/C++ or IEC 61131-3
Protocols: Modbus TCP/RTU (master/slave), SNMP, TCP/IP, UDP, DHCP, BOOTP, SNTP, SMTP

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements
Input Current : 200 mA @ 24 VDC

MTBF (mean time between failures)
Time: 1,032,466 hrs
Standard: Telcordia SR332

EN 50155 c UL us LISTED RoHS EN 50121 CE FC

ioPAC 8600-PW10-15W-T: Dual-power inputs, 24 to 110 VDC, 15 W

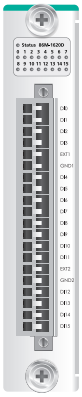
Power
Input Voltage: 24 to 110 VDC (16.8 to 154 VDC)
Note: Compliant with EN 50155 at 24/48/60/72/110 VDC
Wattage: 15 W
Galvanic Isolation: 3k VDC
Dual-Power Input: Yes

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

MTBF (mean time between failures)
Time: 1,579,517 hrs
Standard: Telcordia SR332

EN 50155 c UL us LISTED RoHS EN 50121 CE FC

86M-1620D-T: 16 digital inputs, 24 to 110 VDC, channel LED, sink type



Inputs and Outputs
Digital Inputs: 16 channels
Isolation:
To system:
3k VDC or 2k Vrms

Digital Input
Type: PNP
I/O mode: DI
Logic Definition:
• On: channel voltage > 0.3 x (external power voltage)
• Off: channel voltage < 0.15 x (external power voltage)
Scan Period: 8 ms (typ.)
Scan on Time: 0.5 ms
Debouncing Function: Software disable/enable
Debouncing Time: 1 to 15 ms (software-selectable)
Common Type: 8 points per COM

Physical Characteristics
Wiring: I/O cable, 16 AWG (max.)
Connector: Spring-type terminal block
Channel LED: Yes

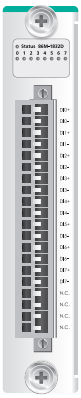
Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements
Input Current: 12.6 mA @ 24 VDC

MTBF (mean time between failures)
Time: 1,115,244 hrs
Standard: Telcordia SR332

EN 50155 c UL us LISTED RoHS EN 50121 CE FC

86M-1832D-T: 8 channel-to-channel isolated DIs, 24 VDC, channel LED, sink/source type



Inputs and Outputs
Digital Inputs: 8 channels
Isolation:
To system: 3k VDC or 2k Vrms
Channel-to-channel: 1k VDC

Digital Input
Sensor Type: Wet contact (NPN or PNP)
I/O Mode: DI, counter, or frequency
Wet Contact (DI+ to DI-):
• On: 10 to 30 VDC
• Off: 0 to 3 VDC
Counter Frequency: 5 kHz
Digital Filtering Time Interval: Software selectable (by 0.1 ms)

Physical Characteristics
Wiring: I/O cable, 16 AWG (max.)
Connector: Spring-type terminal block

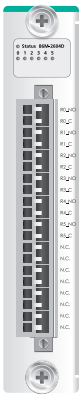
Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements
Input Current: 12.6 mA @ 24 VDC

MTBF (mean time between failures)
Time: 1,149,108 hrs
Standard: Telcordia SR332

EN 50155 c UL us LISTED RoHS EN 50121 CE FC

86M-2604D-T: 6 relays, channel LED, form A (N.O.) type



Inputs and Outputs
Relays: 6 channels
Isolation:
To System: 3k VDC or 2k Vrms

Relay
Type: Form A (N.O.)
I/O mode: DO or PWM
Pulse Output Frequency: 0.33 Hz
Contact Current Rating:
Resistive Load: 5 A @ 30 VDC, 250 VAC
Relay On/Off Time: 10 ms (max.)
Initial Insulation Resistance: 1000 mega-ohms (min.) @ 500 VDC
Mechanical Endurance: 5,000,000 operations
Electrical Endurance: 60,000 operations @ 5 A resistive load
Contact Resistance: 100 milli-ohms (max.)

Physical Characteristics
Wiring: I/O cable, 16 AWG (max.)
Connector: Spring-type terminal block

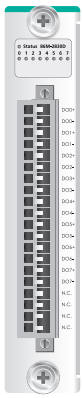
Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements
Input Current: 127 mA @ 24 VDC

MTBF (mean time between failures)
Time: 4,173,843 hrs
Standard: Telcordia SR332

EN 50155 c UL us LISTED RoHS EN 50121 CE FC

86M-2830D-T: 8 channel-to-channel isolated DOs, 24 VDC, channel LED, sink-type



Inputs and Outputs
Digital Outputs: 8 channels
Isolation:
To system: 3k VDC or 2k Vrms
Channel-to-channel: 1k VDC

Digital Output
Type: Sink
I/O Mode: DO or PWM
Pulse Output Frequency: 1 kHz
Short Circuit Protection: 750 mA @ 25°C
Over-Voltage Protection: 41 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C (typical), 150°C (min.)
Current Rating: 200 mA per channel

Physical Characteristics
Wiring: I/O cable, 16 AWG (max.)
Connector: Spring-type terminal block

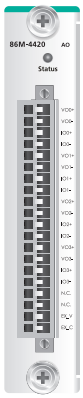
Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements
Input Current: 76.7 mA @ 24 VDC

MTBF (mean time between failures)
Time: 1,766,037 hrs
Standard: Telcordia SR332

EN 50155 cULus LISTED RoHS EN 50121 CE FC

86M-4420-T: 4 analog outputs, 0 to 10 V or -10 to 10 V or 0 to 20 mA or 4 to 20 mA



Inputs and Outputs
Analog Outputs: 4 channels
Isolation:
To system: 3k VDC or 2k Vrms

Analog Output
Resolution: 12 bits
Output range: 0 to 10 V, -10 to 10 V, 0 to 20 mA, 4 to 20 mA
I/O mode: Static or Waveform mode
Voltage Output: 10 mA (max.)
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -40 and 75°C
Current Load Resistance:
Internal Power: 400 ohms
External 24 VDC Power: 1000 ohms
Update Rate: Software polling or waveform mode
Waveform Type: Sine, Triangle, Square
Wavemode Frequency: 125 Hz

Physical Characteristics
Wiring: I/O cable, 16 AWG (max.)
Connector: Spring-type terminal block

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements
Input Current:
94.2 mA @ 24 VDC (voltage)
143.8 mA @ 24 VDC (current)

MTBF (mean time between failures)
Time: 2,409,345 hrs
Standard: Telcordia SR332

EN 50155 cULus LISTED RoHS EN 50121 CE FC

86M-5212U-T: 2-port 2-wire Ethernet switch

Ethernet Communication
Interface: Two 2-wire Ethernet ports
Isolation:
To system: 3k VDC or 2k Vrms

Standards
Supported Standards:
100BASE-TX IEEE 802.3u
10BASE-T IEEE 802.3
100 Mbps BroadR-Reach®
10 Mbps BroadR-Reach®

Physical Characteristics
Wiring: CAT 5 standard cable with M12 D-code male connection
Connector: M12 (D-code, female) x 2
Channel LED: Yes

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements
Input Current: 578 mA @ 3.3 VDC

MTBF (mean time between failures)
Time: 2,498,942 hrs
Standard: Telcordia SR332

EN 50155 cULus LISTED RoHS EN 50121 CE FC

86M-5250-T: 2 CAN ports, channel LED

Serial Communication
Interface: 2 CAN ports
Isolation:
To system: 3k VDC or 2k Vrms

CAN Bus Communication
Protocols:
CAN 2.0A
CAN 2.0B
CANopen DS301, V4.02
CANopen DS401
Speed: 10/20/50/125/250/500/800 kbps, 1 Mbps
Termination Resistor: N/A, 120 ohms (by DIP)

Physical Characteristics
Connector: DB9 male
Channel LED: Yes

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements
Input Current: 60 mA @ 24 VDC

MTBF (mean time between failures)
Time: 3,306,609 hrs
Standard: Telcordia SR332

EN 50155 c UL us LISTED RoHS EN 50121 CE FC

Common Specifications

Power Requirements
Input Voltage: 24 to 110 VDC (16.8 to 154 VDC)

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6

Standards and Certifications
Safety: UL 508
EMC: EN 55022/24
EMI: FCC Part 15 Subpart B Class A, CISPR 22
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS:
80 MHz to 1000 MHz: 3 V/m
1400 MHz to 2100 MHz: 3 V/m
2100 MHz to 2700 MHz: 1 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV (L-PE), 1 kV (L-L); Signal: 1 kV (L-L), 2 kV (L-PE)
IEC 61000-4-6 CS: 3 V
IEC 61000-4-8 PFMF: 3 A/m
Rail Traffic: EN 50155 (essential compliance*), EN 50121-3-2, EN 50121-4
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

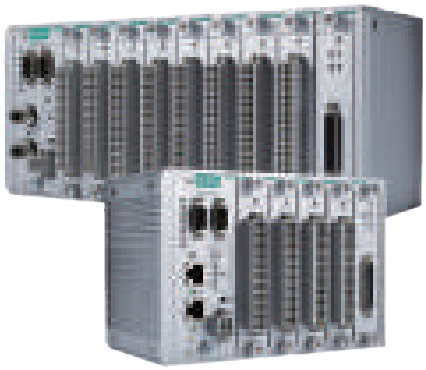
Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

ioPAC 8500 Series

Award-winning Product

TAIWAN EXCELLENCE 2014

Rugged modular RTU controllers



- Dedicated ARM (RISC) CPUs for the main system and each I/O module
- Millisecond timestamp granularity for digital input and analog input
- Supports 5 kHz sampling rate for analog input
- Pre-recording for analog input data logging
- Supports C/C++ or IEC 61131-3 programming languages
- Compliant with EN 50121-3-2, EN 50121-4, and EN 50155 specifications
- Robust and compact design for harsh environments
- Modular I/O for versatility, flexibility, and scalability

RoHS EN 50121 CE FC

Overview

The ioPAC 8500 modular RTU controllers use an ARM9 industrial-grade CPU for the system, and ARM Cortex™ M4 CPUs for the modules. The controllers have 2, 5, or 9 I/O slots for 85M series modules and the dual CPU architecture supports a 5 kHz (per channel) analog input sampling rate, pre-recording of analog input data, and timestamping with millisecond granularity. Moreover, the ioPAC 8500 supports C/C++ or IEC 61131-3 programming, rail-level surge and ESD protection, a -40 to 75°C operating temperature range, vibration protection, hot-swappable modules, two 10/100 Mbps Ethernet ports with two MACs (with port trunking capability), and two 3-in-1 serial ports. Accompanied by Moxa's Active OPC Server and DA-Center data integration software, the ioPAC 8500 series provides a comprehensive solution for data acquisition and control applications in harsh environments.

High Sampling Rate

Moxa's ioPAC 8500 RTUs use an ARM9 industrial-grade CPU, and the dual CPU architecture supports up to a 5 kHz (per channel) analog input sampling rate, giving engineers the analog data precision they need to correctly analyze events after they have occurred.

Analog Input Prerecord Feature

The ioPAC 8500 RTU's prerecord feature allows the RTU controller to continuously record analog input data before an event is triggered. The prerecord feature is a major improvement over products that only start logging data after an event has occurred, because these conventional approaches can often lead to the loss of critical data due to network latency during the event.

Millisecond Timestamp Granularity

Millisecond timestamp granularity is a powerful aid in post-event analysis and troubleshooting. For example, if an emergency triggers 10 separate I/O events within a 10-millisecond time interval, you will still be able to clearly identify the sequence in which the events occurred, even if the I/O events are recorded by different modules.

I/O Module Hot-Swapping

The ioPAC 8500 RTU controller lets you hot-swap I/O modules, allowing engineers to quickly and easily install and replace modules in the field, reducing maintenance costs and streamlining maintenance procedures.

Specifications

Computer
Main CPU: 32-bit ARM9 192 MHz CPU
I/O CPU: 32-bit ARM Cortex M4 80 MHz CPU
OS: Linux
Clock: Real-time clock with battery backup
Memory:
• SDRAM: 64 MB
• Flash: 32 MB
• SRAM: 256 KB (battery backup lasts for 1 week)
• microSD™ Slot: Up to 32 GB (SD 2.0 compatible)
Note: For units operating in extreme temperatures, industrial-grade, wide-temperature microSD cards are required.

Ethernet Interface
LAN: 2 x 10/100 Mbps, 2 MACs (IPs), RJ45 or M12
Protection: 1.5 kV magnetic isolation

Serial Interface
Interface:
• 2 RS-232/422/485 ports, software selectable (DB9 male)
• 1 RS-232 debug port (4-pin connector)
Serial Line Protection: 8 kV ESD for all signals

Serial Communication Parameters
Parity: None, Even, Odd
Data Bits: 7, 8
Stop Bits: 1, 2
Flow Control: RTS/CTS, XON/XOFF
Baudrate: 300 bps to 921.6 kbps

Serial Signals
RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND, RI
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software Characteristics
Automation Languages: C/C++ or IEC 61131-3
Protocols: Modbus TCP/RTU (master/slave), SNMP, TCP/IP, UDP, DHCP, BOOTP, SNTP, SMTP

Power Requirements
Input Voltage: 24 VDC (9 to 48 VDC)
Input Current: 152 mA @ 24 VDC

Physical Characteristics
Housing: Aluminum
Dimensions:
• 2-slot version: 114.7 x 135 x 100 mm (4.52 x 5.31 x 3.94 in)
• 5-slot version: 190.9 x 135 x 100 mm (7.52 x 5.31 x 3.94 in)
• 9-slot version: 292.5 x 135 x 100 mm (11.52 x 5.31 x 3.94 in)
Weight:
• 2-slot version: 1300 g (2.87 lb)
• 5-slot version: 2000 g (4.41 lb)
• 9-slot version: 2575 g (5.68 lb)
Mounting: DIN rail (standard), wall (optional)
Connector: Spring-type terminal block

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
Altitude: Up to 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

Standards and Certifications
Safety: UL 508
EMC: EN 55022, EN 55024
EMI: FCC Part 15 Subpart B Class A, CISPR 22
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS:
80 MHz to 1000 MHz: 3 V/m
1400 MHz to 2100 MHz: 3 V/m
2100 MHz to 2700 MHz: 1 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV (L-PE), 1 kV (L-L); Signal: 1 kV (L-L), 2 kV (L-PE)
IEC 61000-4-6 CS: 3 V
IEC 61000-4-8 PFMF: 3 A/m
Rail Traffic: EN 50155*, EN 50121-3-2, EN 50121-4
*Complies with a portion of EN 50155 specifications.
Note: Please check Moxa's website for the most up-to-date certification status.

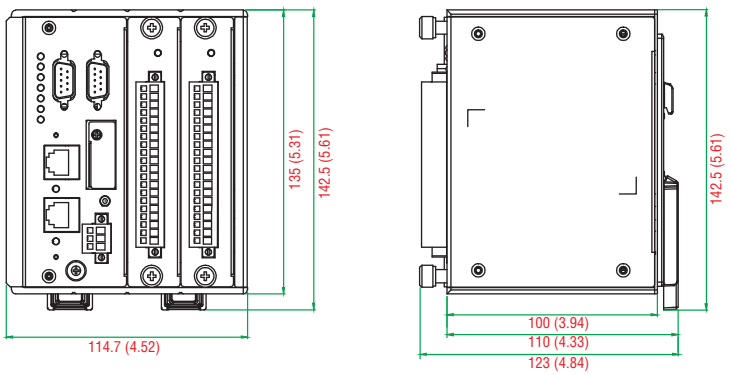
MTBF (mean time between failures)
Time: 859,979 hrs
Standard: Telcordia SR332

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

ioPAC 8500-2

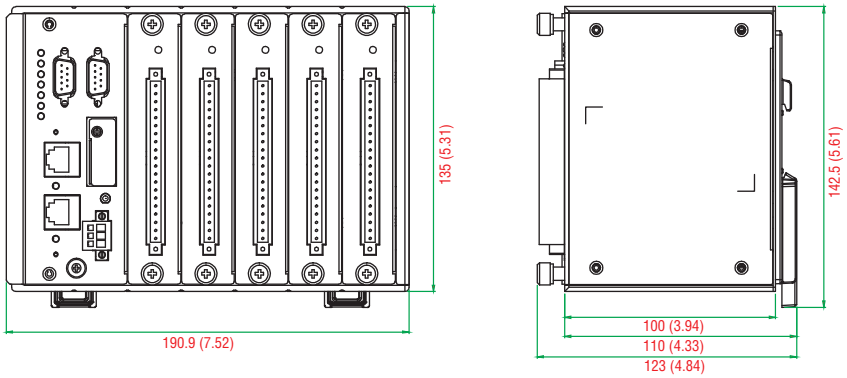
Unit: mm (inch)



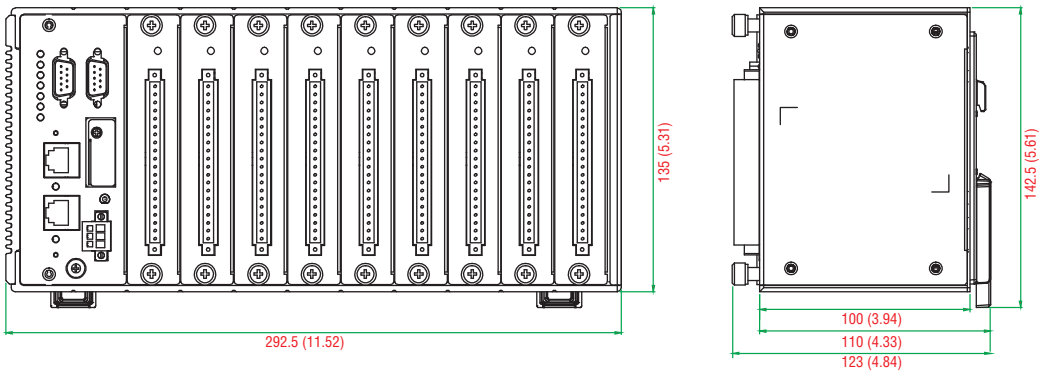
Dimensions

Unit: mm (inch)

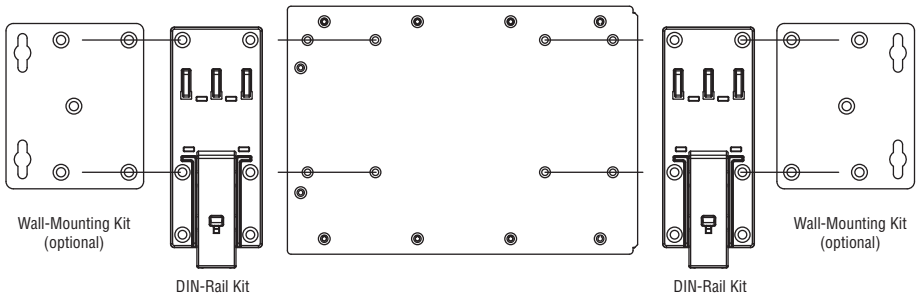
ioPAC 8500-5



ioPAC 8500-9



Mounting Kits



Ordering Information

System Modules

ioPAC 8500-2-M12-C-T: Modular C/C++ programmable controller with 2 slots, M12 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8500-2-M12-IEC-T: Modular IEC 61131-3 programmable controller with 2 slots, M12 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8500-2-RJ45-C-T: Modular C/C++ programmable controller with 2 slots, RJ45 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8500-2-RJ45-IEC-T: Modular IEC 61131-3 programmable controller with 2 slots, RJ45 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8500-5-M12-C-T: Modular C/C++ programmable controller with 5 slots, M12 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8500-5-M12-IEC-T: Modular IEC 61131-3 programmable controller with 5 slots, M12 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8500-5-RJ45-C-T: Modular C/C++ programmable controller with 5 slots, RJ45 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8500-5-RJ45-IEC-T: Modular IEC 61131-3 programmable controller with 5 slots, RJ45 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8500-9-M12-C-T: Modular C/C++ programmable controller with 9 slots, M12 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8500-9-M12-IEC-T: Modular IEC 61131-3 programmable controller with 9 slots, M12 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8500-9-RJ45-C-T: Modular C/C++ programmable controller with 9 slots, RJ45 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8500-9-RJ45-IEC-T: Modular IEC 61131-3 programmable controller with 9 slots, RJ45 Ethernet ports, -40 to 75°C operating temperature

Package Checklist (ioPAC 8500)

- ioPAC 8500 system module
- Serial console cable (C/C++ version only)
- Documentation and software CD

I/O Modules (can be purchased separately)

85M-1602-T: 16 DIs, sink/source, 24 VDC, dry contact, -40 to 75°C operating temperature
85M-2600-T: 16 DOs, sink, 24 VDC, -40 to 75°C operating temperature
85M-3800-T: 8 AIs, 4 to 20 mA, 16 bits, -40 to 75°C operating temperature
85M-3810-T: 8 AIs, 4 to 20 mA, 16 bits, 40 kHz, -40 to 75°C operating temperature
85M-3801-T: 8 AIs, 0 to 10 VDC, 16 bits, -40 to 75°C operating temperature
85M-3811-T: 8 AIs, 0 to 10 VDC, 16 bits, 40 kHz, -40 to 75°C operating temperature
85M-5401-T: 4 serial ports (RS-232/422/485 3-in-1), -40 to 75°C operating temperature
85M-6600-T: 6 RTDs, -40 to 75°C operating temperature
85M-6810-T: 8 TCs, -40 to 75°C operating temperature
Note: Conformal coating available on request

Package Checklist (85M modules)

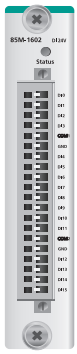
- 85M module
- Serial cable: CBL-M44M9x4-50 (85M-5401-T only)

Optional Accessories (can be purchased separately)

DK-DC50131-01: DIN-rail mounting kit, 50 x 131 mm
WK-75: Wall-mounting kit, 2 plates with 8 screws
CBL-M12D(MM4P)/RJ45-100 IP67: 4-pin D-code M12-to-RJ45 CAT5E UTP Ethernet cable, 100 cm, IP67 waterproof
CBL-RJ458P-100: 8-pin RJ45 CAT5 Ethernet cable, 100 cm
CBL-F9DPF1x4-BK-100: Serial console cable
CBL-M44M9x4-50: DB44 to 4-port DB9 female serial cable
85M-BKTES: Empty slot covers (3 per order)

ioPAC 8500 Series Modules

85M-1602-T: 16 digital inputs, 24 VDC, sink/source type



Inputs and Outputs
Digital Inputs: 16 channels
Isolation: 3k VDC or 2k Vrms

Digital Input
Sensor Type: Wet contact (NPN or PNP), dry contact
I/O Mode: DI, Counter or Frequncy
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to COM):
• Off: 0 to 3 VDC
• On: 10 to 30 VDC
Common Type: 8 points per COM
Counter Frequency: 5 kHz
Digital Filtering Time Interval: Software selectable (by 0.1 ms)

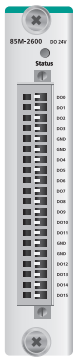
Physical Characteristics
Wiring: I/O cable, 16 AWG (max.)
Connector: Spring-type terminal block

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements
Input Current: 363.6 mA @ 3.3 VDC

MTBF (mean time between failures)
Time: 1,132,561 hrs
Standard: Telcordia SR332

85M-2600-T: 16 digital outputs, 24 VDC, sink-type



Inputs and Outputs
Digital Outputs: 16 channels
Isolation: 3k VDC or 2k Vrms

Digital Output
Type: Sink
I/O Mode: DO or PWM
Pulse Output Frequency: 5 kHz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C (typical), 150°C (min.)
Current Rating: 200 mA per channel

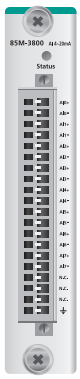
Physical Characteristics
Wiring: I/O cable, 16 AWG (max.)
Connector: Spring-type terminal block

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements
Input Current: 257.6 mA @ 3.3 VDC

MTBF (mean time between failures)
Time: 792,571 hrs
Standard: Telcordia SR332

85M-3800-T: 8 analog inputs, 4 to 20 mA



Inputs and Outputs
Analog Inputs: 8 channels
Isolation: 3k VDC or 2k Vrms

Analog Input
Type: Differential
Resolution: 16 bits
I/O Mode: 4 to 20 mA (wire off)
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -40 and 75°C
Sampling Rate:
• All channels: 100 samples/sec
• Per channel: 12.5 samples/sec
Input Impedance: 125 ohms (min.)

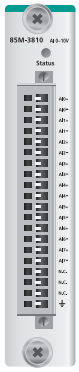
Physical Characteristics
Wiring: I/O cable, 16 AWG (max.)
Connector: Spring-type terminal block

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements
Input Current: 318.2 mA @ 3.3 VDC

MTBF (mean time between failures)
Time: 1,512,906 hrs
Standard: Telcordia SR332

85M-3810-T: 8 analog inputs, 0 to 10 VDC



Inputs and Outputs
Analog Inputs: 8 channels
Isolation: 3k VDC or 2k Vrms

Analog Inputs
Type: Differential
Resolution: 16 bits
I/O Mode: 0 to 10 VDC
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -40 and 75°C
Sampling Rate:
• All channels: 100 samples/sec
• Per channel: 12.5 samples/sec
Input Impedance: 200 kilo-ohms (min.)

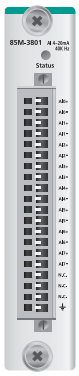
Physical Characteristics
Wiring: I/O cable, 16 AWG (max.)
Connector: Spring-type terminal block

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements
Input Current: 315.2 mA @ 3.3 VDC

MTBF (mean time between failures)
Time: 1,530,690 hrs
Standard: Telcordia SR332

85M-3801-T: 8 analog inputs, 4 to 20 mA, 40 kHz



Inputs and Outputs
Analog Inputs: 8 channels
Isolation: 3k VDC or 2k Vrms

Analog Input
Type: Differential
Resolution: 16 bits
I/O Mode: 4 to 20 mA (wire off)
Historical Data Buffering: 60 KB per channel, 6-second data buffer at 5 kHz
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -40 and 75°C
Sampling Rate:
• All channels: 40k samples/sec
• Per channel: 5k samples/sec
Input Impedance: 125 ohms (min.)

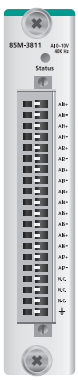
Physical Characteristics
Wiring: I/O cable, 16 AWG (max.)
Connector: Spring-type terminal block

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements
Input Current: 378.8 mA @ 3.3 VDC

MTBF (mean time between failures)
Time: 1,426,112 hrs
Standard: Telcordia SR332

85M-3811-T: 8 analog inputs, 0 to 10 VDC, 40 kHz



Inputs and Outputs
Analog Inputs: 8 channels
Isolation: 3k VDC or 2k Vrms

Analog Inputs
Type: Differential
Resolution: 16 bits
I/O Mode: 0 to 10 VDC
Historical Data Buffering: 60 KB per channel, 6-second data buffer at 5 kHz
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -40 and 75°C
Sampling Rate:
• All channels: 40k samples/sec
• Per channel: 5k samples/sec
Input Impedance: 20 mega-ohms (min.)

Physical Characteristics
Wiring: I/O cable, 16 AWG (max.)
Connector: Spring-type terminal block

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements
Input Current: 378.8 mA @ 3.3 VDC

MTBF (mean time between failures)
Time: 1,426,112 hrs
Standard: Telcordia SR332

85M-5401-T: 4 serial ports (RS-232/422/485)

Serial Communication

Interface: 4 RS-232/422/485 ports, software selectable (DB44 female)
Isolation: 3k VDC or 2k Vrms
Note: DB44 to 4-port DB9 cable included in the package.

Serial Communication Parameters

Parity: None, Even, Odd
Data Bits: 7, 8
Stop Bits: 1, 2
Flow Control: RTS/CTS, XON/XOFF
Baudrate: 300 bps to 921.6 kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Physical Characteristics

Connector: DB44 female

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements

Input Current: 375.8 mA @ 3.3 VDC

MTBF (mean time between failures)

Time: 596,611 hrs
Standard: Telcordia SR332

85M-6600-T: 6 RTDs

Inputs and Outputs

RTD Inputs: 6 channels
Isolation: 3k VDC or 2k Vrms

RTDs

Input Type:
• PT50, PT100, PT200, PT500 (-200 to 850°C)
• PT1000 (-200 to 350°C)
• JPT100, JPT200, JPT500 (-200 to 640°C)
• JPT1000 (-200 to 350°C)
• NI100, NI200, NI500 (-60 to 250°C)
• NI1000 (-60 to 150°C)
• NI120 (-80 to 260°C)
• Resistance of 310, 620, 1250, and 2200 ohms
Sampling Rate (single channel):
• All channels: 12 samples/sec
• Per channel: 2 samples/sec

Resolution: 0.1°C or 0.1 ohms
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -40 and 75°C
Input Impedance: 625 kilo-ohms (min.)
Wiring: I/O cable, 16 AWG (max.)
Connector: Spring-type terminal block

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 176°F)

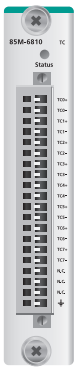
Power Requirements

Input Current: 201.5 mA @ 3.3 VDC

MTBF (mean time between failures)

Time: 571,446 hrs
Standard: Telcordia SR332

85M-6810-T: 8 thermocouples



Inputs and Outputs

Analog Inputs: 8 channels
Isolation: 3k VDC or 2k Vrms

Thermocouples

Sensor Type: J (0 to 750°C), K (-200 to 1250°C), T (-200 to 350°C), E (-200 to 900°C), R (-50 to 1600°C), S (-50 to 1760°C), B (600 to 1700°C), N (-200 to 1300°C)
Millivolt Type:
- Mode: ±78.126 mV, ±39.062 mV, ±19.532 mV
- Fault and over-voltage protection: -35 to +35 VDC (power off); -25 to +30 VDC (power on)

Sampling Rate (single channel):
- All channels: 12 samples/sec
- Per channel: 1.5 samples/sec

Resolution: 16 bits

Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -40 and 75°C
Input Impedance: 1 mega-ohm (min.)
Wiring: I/O cable, 16 AWG (max.)
Connector: Spring-type terminal block

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 176°F)

Power Requirements

Input Current: 175.5 mA @ 3.3 VDC

MTBF (mean time between failures)

Time: 2,324,891 hrs
Standard: Telcordia SR332

Common Specifications

Power Requirements

Input Voltage: 24 VDC (9 to 48 VDC)

Environmental Limits

Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: FCC Part 15 Subpart B Class A, CISPR 22
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS:
80 MHz to 1000 MHz: 3 V/m
1400 MHz to 2100 MHz: 3 V/m
2100 MHz to 2700 MHz: 1 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV (L-PE), 1 kV (L-L); Signal: 1 kV (L-L), 2 kV (L-PE)
IEC 61000-4-6 CS: 3V
IEC 61000-4-8 PFMF: 3 A/m

Rail Traffic: EN 50155*, EN 50121-3-2, EN 50121-4
*Complies with a portion of EN 50155 specifications.

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

ioPAC 8020 Series

Rugged modular RTU controllers

- Compliant with EN 50121-3-2, EN 50121-4, and a portion of EN 50155 specifications
- Supports C/C++ programming languages
- 2-port Ethernet switch for daisy-chain topologies with bypass function
- Modular I/O for versatility, flexibility, and scalability
- Rugged and compact design for harsh environments
- Wide operating temperature: -40 to 75°C (-40 to 167°F)
- 3-in-1 RS-232/422/485 serial port
- Up to 32 GB SDHC data logging function

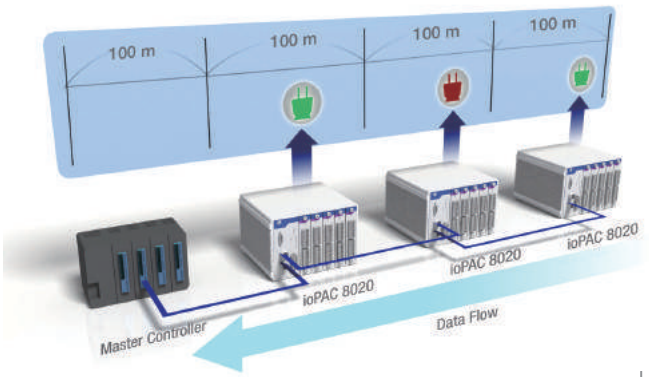
Overview

Sturdy and dependable, ioPAC 8020-C modular RTU controllers are an ideal solution for rolling stock and trackside applications. This series tolerates temperature extremes from -40 to 75°C, is enclosed in a sealed metal casing, and is compliant with EN 50121-3-2, EN 50121-4, and relevant sections of the EN 50155 anti-vibration standard. The ioPAC 8020-C further features a Linux/GNU platform adapted to data acquisition and condition monitoring. The main advantage of this open C platform is its user-friendly SDK, which helps economize on installation and configuration overhead by reducing your programming workload for key areas, including I/O control and condition monitoring, SCADA/DB interoperability, and improving smart communication controls.

The ioPAC-8020-C has a 2-port Ethernet switch that allows system integrators to easily build control networks with open Ethernet standards and daisy-chain topologies. Built-in dual power inputs ensure non-stop data transfer to the controller and uninterrupted communications management on the control network. For train-related applications, spring-type terminal blocks and optional M12 Ethernet connectors deliver reliable operations in high vibration environments. In addition, a rich selection of hot-swap I/O and communication modules is available for any combination of device applications.

Ethernet bypass feature for seamless data transmission

ioPAC RTU controllers also come with an integrated, independent, 2-port Ethernet switch for the convenient daisy-chaining of ioPAC RTU controllers. In distributed Ethernet data acquisition applications, panels, units, and cabinets are often located at remote sites where space is limited. The daisy-chain capability of ioPAC controllers allows ioPAC RTUs to connect in series either to each other or to other nearby Ethernet devices, drastically saving on both space and wiring costs. Because the Ethernet switch is independent of the main RTU and includes the power-off bypass mechanism, ioPAC RTU controllers are able to maintain continuous and seamless data transmissions even when a linked device fails.



Hot-swappable modular I/O

ioPAC RTU controllers offer a modular design in a compact size to save space in installation cabinets. For modular ioPAC RTU controllers, the hot-swap capability allows users to unplug and then re-plug a module without shutting down the system, so that maintenance engineers can easily complete replacement tasks and reduce system downtime.

Specifications

Computer
CPU: 32-bit ARM9 160 MHz CPU
OS: Linux
Clock: Real-time clock with battery backup
SDRAM: 64 MB
Flash: 32 MB
SD™ Slot: Up to 32 GB (SD 2.0 compatible)
Note: For units operating in extreme temperatures, industrial-grade, wide-temperature SD cards are required.

Ethernet Interface
LAN: 2 x 10/100 Mbps, Ethernet bypass, RJ45 or M12
Protection: 1.5 kV magnetic isolation

Serial Interface
Serial Ports: RS-232/422/485 (DB9 male)
Serial Debug Port: RS-232 (4-pin connector)

Serial Ports
RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 184 mA @ 24 VDC (without I/O modules)
Note: Compliant with EN 50155 at 24 VDC

Physical Characteristics
Housing: Aluminum
Dimensions:
5-slot version: 190.9 x 135 x 100 mm (7.52 x 5.31 x 3.94 in)
9-slot version: 292.5 x 135 x 100 mm (11.52 x 5.31 x 3.94 in)
Weight:
5-slot version: 2,000 g (4.41 lb)
9-slot version: 2,575 g (5.68 lb)
Mounting: DIN rail (standard), wall (optional)
I/O Module Slots: 5 or 9 slots (the 9th slot is reserved)

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
Altitude: Up to 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

Standards and Certifications
Safety: UL 508
EMC: EN 55022/24
EMI: FCC Part 15 Subpart B Class A, CISPR 22
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS:
80 MHz to 1000 MHz: 10 V/m
1400 MHz to 2100 MHz: 3 V/m
2100 MHz to 2700 MHz: 1 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV (L-PE), 1 kV (L-L); Signal: 1 kV (9-slot version)
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8 PFMF: 30 A/m
Rail Traffic: EN 50155*, EN 50121-3-2, EN 50121-4
*Complies with a portion of EN 50155 specifications.
Green Product: RoHS, CRoHS, WEEE
Note: Please check Moxa's website for the most up-to-date certification status.

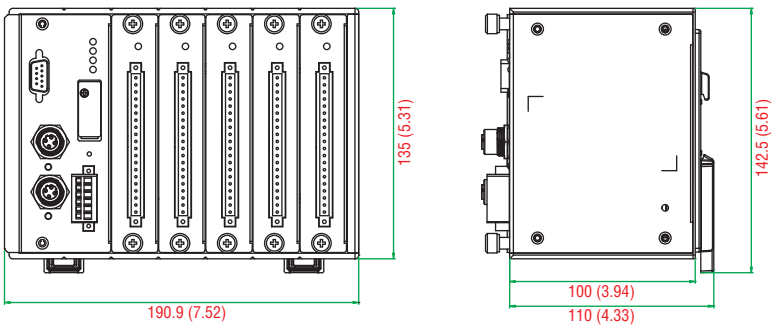
MTBF (mean time between failures)
Time: 690,214 hrs
Standard: Telcordia SR332

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

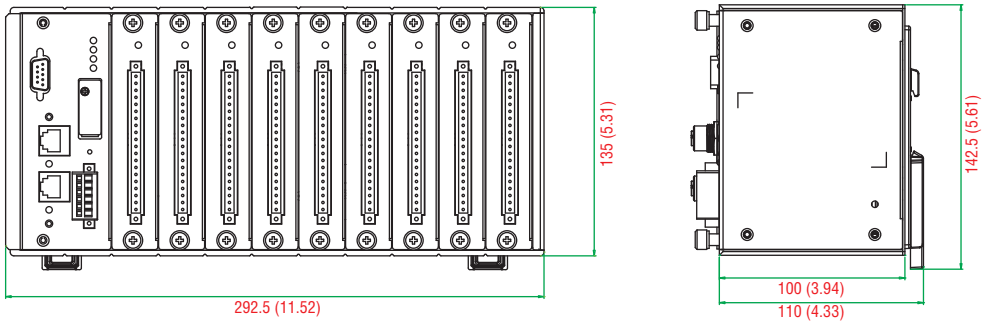
ioPAC 8020-5



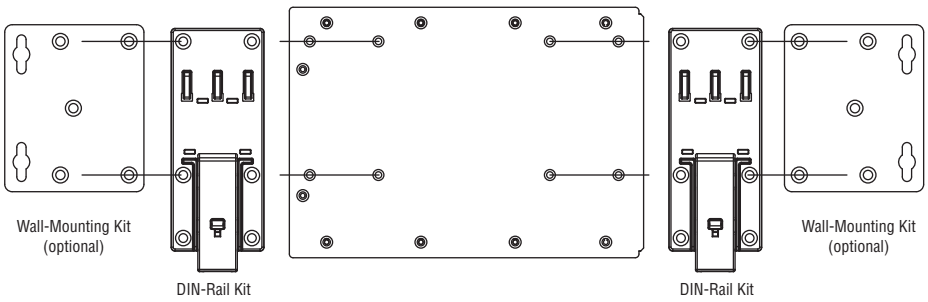
Dimensions

Unit: mm (inch)

ioPAC 8020-9



Mounting Kits



Ordering Information

System Modules

ioPAC 8020-5-M12-C-T: Modular programmable controller with 5 slots, M12 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8020-5-RJ45-C-T: Modular programmable controller with 5 slots, RJ45 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8020-9-M12-C-T: Modular programmable controller with 9 slots, M12 Ethernet ports, -40 to 75°C operating temperature
ioPAC 8020-9-RJ45-C-T: Modular programmable controller with 9 slots, RJ45 Ethernet ports, -40 to 75°C operating temperature

Package Checklist

- ioPAC 8020-C
- Ethernet cable: CBL-M12D(MM4P)/RJ45-100 IP67
- Serial cable: CBL-F9DPF1x4-BK-100
- Documentation and software CD

I/O Modules (can be purchased separately)

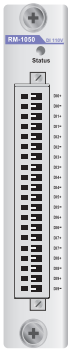
RM-1050-T: 10 DIs, 110 VDC, ch-to-ch isolation, -40 to 75°C operating temperature
RM-1602-T: 16 DIs, sink/source, 24 VDC, -40 to 75°C operating temperature
RM-2600-T: 16 DOs, sink, 24 VDC, -40 to 75°C operating temperature
RM-3802-T: 8 AIs, 4 to 20 mA, 16 bits, -40 to 75°C operating temperature
RM-3810-T: 8 AIs, 0 to 10 V, 16 bits, -40 to 75°C operating temperature
KM-2430-T: 4-port unmanaged Ethernet switch, M12, -40 to 75°C operating temperature
Note: Conformal coating available on request

Optional Accessories (can be purchased separately)

DK-DC50131-01: DIN-rail mounting kit, 50 x 131 mm
WK-75: Wall-mounting kit, 2 plates with 8 screws
CBL-M12D(MM4P)/RJ45-100 IP67: 4-pin D-code M12-to-RJ45 CAT5E UTP Ethernet cable, 100 cm, IP67 waterproof
CBL-RJ458P-100: 8-pin RJ45 CAT5 Ethernet cable, 100 cm
CBL-F9DPF1x4-BK-100: Serial console cable

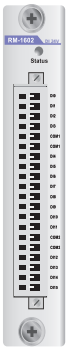
ioPAC 8020 Series Modules

RM-1050-T: 10 channel-to-channel isolated DIs, 110 VDC, sink/source type



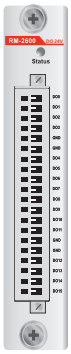
Digital Inputs: 10 channels, 110 VDC, channel-to-channel isolation
On: 50 to 175 VDC
Off: 0 to 15 VDC
Input Impedance: 120 kilo-ohms (typical)
Response Time: 10 ms
Isolation: 3k VDC or 2k Vrms
Channel-to-Channel Isolation: 2.5k VDC
Operating Temperature: -40 to 75°C (-40 to 176°F)
Input Current: 7 mA @ 24 VDC
Wiring: I/O cable, 14 AWG (max.)
MTBF: 3,993,435 hrs (Standard: Telcordia SR332)

RM-1602-T: 16 digital inputs, 24 VDC, sink/source type



Digital Inputs: 16 channels, 24 VDC, sink/source type
On: 10 to 30 VDC
Off: 0 to 3 VDC
Input Impedance: 3 kilo-ohms (typical)
Common Type: 8 points per 2 COMs
Response Time: 10 ms
Isolation: 3k VDC or 2k Vrms
Operating Temperature: -40 to 75°C (-40 to 176°F)
Input Current: 7 mA @ 24 VDC
Wiring: I/O cable, 14 AWG (max.)
MTBF: 4,132,863 hrs (Standard: Telcordia SR332)

RM-2600-T: 16 digital outputs, 24 VDC, sink-type



Digital Outputs: 16 channels, 24 VDC, sink-type
Output Impedance: 120 milli-ohms (typical)
Current Rating: 200 mA per channel
Off-state Resistance: 500 kilo-ohms (typical)
Response Time: 10 ms
Over Current Protection: 2.6 A (4 channels @ 650 mA)
Isolation: 3k VDC or 2k Vrms
Operating Temperature: -40 to 75°C (-40 to 176°F)
Input Current: 10 mA @ 24 VDC
Wiring: I/O cable, 14 AWG (max.)
MTBF: 4,440,241 hrs (Standard: Telcordia SR332)

RM-3802-T: 8 analog inputs, 4 to 20 mA

Analog Inputs: 8 channels, differential
Input Range: 4 to 20 mA
Input Impendence: 120 ohms
Resolution: 16 bits, 0.24 µA/bit
Accuracy:
±0.1%, FSR @ 25°C
±0.3%, FSR @ -40°C and 75°C
Sampling Rate:
• All channels: 12 samples/sec
• Per channel: 1.5 samples/sec
Isolation: 3k VDC or 2k Vrms
Operating Temperature: -40 to 75°C (-40 to 176°F)

Input Current: 78 mA @ 24 VDC
Wiring: I/O cable, 14 AWG (max.)
MTBF: 1,222,361 hrs (Standard: Telcordia SR332)

RM-3810-T: 8 analog inputs, 0 to 10 V

Analog Inputs: 8 channels, differential
Input Range: 0 to 10 VDC
Input Impendence: 10 mega-ohms (min.)
Resolution: 16 bits, 0.15 µA/bit
Data Format: 16-bit integer (2's complement)
Accuracy:
±0.1%, FSR @ 25°C
±0.3%, FSR @ -40°C, 75°C
Sampling Rate:
• All channels: 12 samples/sec
• Per channel: 1.5 samples/sec
Isolation: 3k VDC or 2k Vrms
Operating Temperature: -40 to 75°C (-40 to 176°F)

Input Current: 78 mA @ 24 VDC
Wiring: I/O cable, 14 AWG (max.)
MTBF: 1,225,957 hrs (Standard: Telcordia SR332)

KM-2430-T: 4-port unmanaged Ethernet switch module

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control
Processing Type: Store and Forward
Interface: Front cabling, M12 connector, 10/100BaseT(X) auto negotiation speed
Operating Temperature: -40 to 75°C (-40 to 176°F)
Input Current: 20 mA @ 24 VDC
MTBF: 3,873,592 hrs (Standard: Telcordia SR332)

ioPAC 5542 Series

Rugged, compact RTU controllers

- Dedicated ARM CPUs for both the main system and I/O channels
- Millisecond timestamp granularity on both digital input and analog input
- Up to 250 Hz sampling rate per analog input channel
- Prerecord feature for analog input data logging
- Supports C/C++ or IEC 61131-3 programming languages
- Compliant with EN 50121-4, UL/cUL Class 1 Division 2
- Robust and compact design for harsh environments

Overview

The ioPAC 5500 standalone controllers use an ARM9 industrial-grade CPU for the main system, with ARM Cortex™ M4 based CPUs used for I/O channels. The dual CPU architecture supports up to a 250 Hz per channel analog input sampling rate with millisecond timestamp granularity. The ioPAC 5500 supports C/C++ or IEC 61131-3 programming langauges, rail-level surge and ESD protection, a -40 to 75°C (-30 to 75°C for HSPA models) operating temperature range, UL/cUL Class 1 Division 2 certifications, two 10/100 Mbps Ethernet ports with two MACs (Port Trunking ready), and two 3-in-1 serial ports. With Moxa's Active OPC Server and DA-Center, the ioPAC 5500 series provides a comprehensive solution for data acquisition and control applications in harsh environments.

High Sampling Rate

Moxa's ioPAC 5542 RTUs use an ARM9 industrial-grade CPU, and the dual CPU architecture supports up to a 2000 Hz analog input sampling rate (all channels), giving engineers the analog data precision they need to correctly analyze events, and then formulate the best response.

Prerecorded Analog Input

Prerecording

The ioPAC 5542's prerecord function allows the RTU controller to continuously record analog input data before an event trigger point. The prerecording function is a major improvement over products that only start data logging after an event has occurred, which can lead to the loss of critical data due to the latency between the event and when the data logging actually begins.

Specifications

Computer

Main CPU: 32-bit ARM9 192 MHz CPU
I/O CPU: 32-bit ARM Cortex M4 80 MHz CPU
OS: Linux
Clock: Real-time clock with battery backup
Memory:
• SDRAM: 64 MB
• Flash: 32 MB
• SRAM: 256 KB (battery backup lasts for 1 week)
• microSD™ Slot: Up to 32 GB (SD 2.0 compatible)
Note: For units operating in extreme temperatures, industrial-grade, wide-temperature microSD cards are required.

Cellular (for the ioPAC 5542-HSPA Series)

Network:
• Quad-band GSM/GPRS/EDGE 850/900/1800/1900 MHz
• Five-band UMTS/HSPA+ 800/850/AWS/1900/2100 MHz
Internet:
HSPA:
• Up to 5.76 Mbps upload speed
• Up to 14.4 Mbps download speed
UMTS: Up to 384 kbps upload/download speed
EDGE Class 12: Up to 237 kbps upload/download speed
GPRS Class 12: Up to 85.6 kbps upload/download speed
SMS: Point-to-Point Text/PDU mode
SIM Control Voltage: 3/1.8 V

Ethernet Interface

LAN: 2 x 10/100 Mbps, 2 MACs (IPs), RJ45
Protection: 1.5 kV magnetic isolation

Serial Interface

Interface:
• 2 RS-232/422/485 ports, software selectable (DB9 male)
• 1 RS-232 debug port (4-pin connector)
Serial Line Protection: 15 kV ESD for all signals

Serial Communication Parameters

Parity: None, Even, Odd
Data Bits: 7, 8
Stop Bits: 1, 2
Flow Control: RTS/CTS, XON/XOFF
Baudrate: 300 bps to 921.6 kbps

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND, RI
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Inputs and Outputs

Digital Inputs: 8 channels
Configurable DIOs: 8 channels
Analog Inputs: 8 channels
Isolation: 3k VDC or 2k Vrms

Digital Input

Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI Counter or Frequency
Dry Contact:
• On: short to GND
• Off: open
Wet Contact:
NPN (DI to GND):
• On: 0 to 3 VDC
• Off: 10 to 30 VDC
PNP (DI to GND):
• Off: 0 to 3 VDC
• On: 10 to 30 VDC
Common Type: 4 points per COM
Counter Frequency: 1 kHz
Digital Filtering Time Interval: Software selectable (by 0.5 ms)

Digital Output

Type: Sink
I/O Mode: DO or PWM
Pulse Output Frequency: 1 kHz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C (typical), 150°C (min.)
Current Rating: 200 mA per channel

Analog Input

Type: Differential Input
Resolution: 16 bits
I/O Mode: Voltage / Current
Input Range: 0 to 10 VDC, -10 to 10 VDC, 0 to 20 mA, 4 to 20 mA (wire off)
Historical Data Buffering: 60 KB per channel, 120-second data buffer at 250 Hz
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -40 and 75°C
Sampling Rate:
• All channels: 2000 samples/sec
• Per channel: 250 samples/sec
Input Impedance: 2 mega-ohms (min.)
Built-in Resistor for Current Input: 120 ohms (min.)

Software Characteristics

Automation Languages: C/C++ or IEC 61131-3
Protocols: Modbus TCP/RTU (master/slave), SNMP TCP/IP, UDP, DHCP, BOOTP, SNTP, SMTP

Power Requirements

Input Voltage: 24 VDC (9 to 48 VDC)
Input Current:
• ioPAC 5542-HSPA series: 305 mA @ 24 VDC
• ioPAC 5542 series: 264 mA @ 24 VDC

Physical Characteristics

Housing: Aluminum
Dimensions: 90.05 x 135 x 105.4 mm (3.55 x 5.32 x 4.15 in)
Weight:
• ioPAC 5542-HSPA Series: 1100 g (2.43 lb)
• ioPAC 5542 Series: 1000 g (2.20 lb)
Mounting: DIN rail (standard), wall (optional)
Connector: Spring-type terminal block

Environmental Limits

Operating Temperature:
• ioPAC 5542 Series: -40 to 75°C (-40 to 176°F)
• ioPAC 5542-HSPA Series: -30 to 75°C (-22 to 176°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
Altitude: 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: FCC Part 15 Subpart B Class A, CISPR 22
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1000 MHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV (L-PE), 1 kV (L-L); Signal: 1 kV
IEC 61000-4-6 CS: 3 V
IEC 61000-4-8 PFMF: 1 A/m
Radio: NCC
Rail Traffic: EN 50121-4
Hazardous Location: Class 1 Division 2
Note: Please check Moxa's website for the most up-to-date certification status.

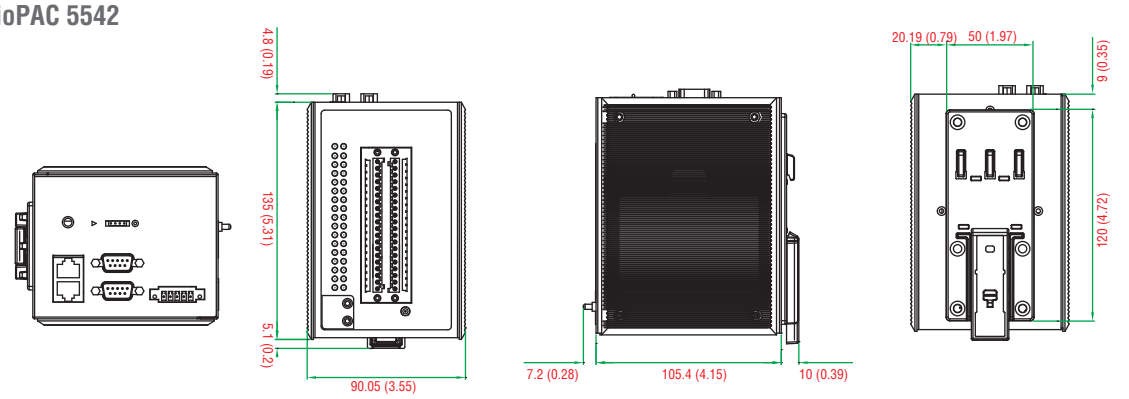
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

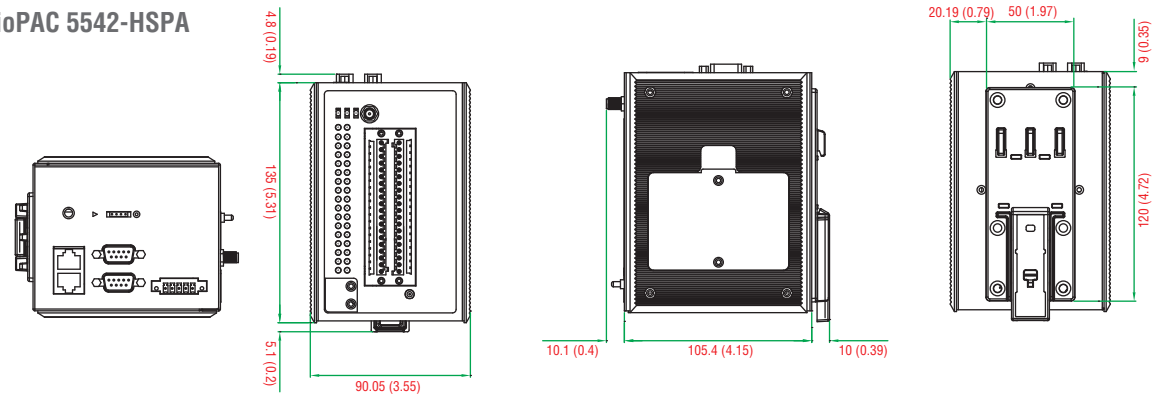
Unit: mm (inch)

ioPAC 5542



Top View | Front View | Side View | Rear View

ioPAC 5542-HSPA



Top View | Front View | Side View | Rear View

Ordering Information

Available Models

ioPAC 5542-C-T: Rugged, compact, Ethernet, C/C++ programmable controller with 8 DIs, 8 DIOs, 8 AIs, -40 to 75°C operating temperature
ioPAC 5542-IEC-T: Rugged, compact, Ethernet, IEC 61131-3 programmable controller with 8 DIs, 8 DIOs, 8 AIs, -40 to 75°C operating temperature
ioPAC 5542-HSPA-C-T: Rugged, compact, HSPA, C/C++ programmable controller with 8 DIs, 8 DIOs, 8 AIs, -30 to 75°C operating temperature
ioPAC 5542-HSPA-IEC-T: Rugged, compact, HSPA, IEC 61131-3 programmable controller with 8 DIs, 8 DIOs, 8 AIs, -30 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DK-DC50131: DIN-rail mounting kit, 50 x 131 mm
CBL-RJ458P-100: 8-pin RJ45 CAT5 Ethernet cable, 100 cm
CBL-F9DPF1x4-BK-100: Serial console cable
WK-51-01: Wall-mounting kit, 2 plates with 6 screws
ANT-WCDMA-AHSM-04-2.5m Black: 3G cellular antenna

Package Checklist

- ioPAC 5500 controller
- Serial cable: CBL-F9DPF1x4-BK-100
- Cellular 3G antenna: ANT-WCDMA-AHSM-04-2.5m black
- Documentation and software CD

Smart Remote I/O

Product Selection Guide

Smart Remote I/O with Click&Go Plus Logic 16-2
Smart Remote I/O with Click&Go Logic 16-3

Smart Wireless I/O

ioLogik 2500 HSPA/GPRS/WLAN Series: Smart wireless remote I/O with Click&Go Plus Logic. 16-4
ioLogik W5340-HSPA: Smart HSPA remote I/O with Click&Go Logic 16-9

Smart Ethernet I/O

ioLogik 2500 Ethernet Series: Smart Ethernet remote I/O with Click&Go Plus Logic 16-13
ioLogik E2200 Series: Smart Ethernet remote I/O with Click&Go Logic. 16-17

Smart Remote I/O with Click&Go Plus Logic

	ioLogik 2542-HSPA	ioLogik 2542-GPRS	ioLogik 2542-WL1	ioLogik 2542	ioLogik 2512-HSPA	ioLogik 2512-GPRS	ioLogik 2512-WL1	ioLogik 2512
Inputs/Outputs								
Digital Inputs	–	–	–	–	8	8	8	8
Configurable DIOs	12	12	12	12	8	8	8	8
Analog Inputs	4	4	4	4	–	–	–	–
Cellular								
Band Options	UMTS/HSPA+: five-band 800/850/900/1900/2100 MHz GSM/GPRS/EDGE: quad-band 850/900/1800/1900 MHz	GSM/GPRS/EDGE: quad-band 850/900/1800/1900 MHz	–	–	UMTS/HSPA+: five-band 800/850/900/1900/2100 MHz GSM/GPRS/EDGE: quad-band 850/900/1800/1900 MHz	GSM/GPRS/EDGE: quad-band 850/900/1800/1900 MHz	–	–
WLAN								
Standard	–	–	IEEE 802.11a/b/g for Wireless LAN IEEE 802.11i for Wireless Security	–	–	–	IEEE 802.11a/b/g for Wireless LAN IEEE 802.11i for Wireless Security	–
Ethernet								
Ports (Connector)	4 switched ports, with 1 optimized port for faster downstream communications with up to 8 daisy-chained ioLogik E1200 units (RJ45)							
Speed	10/100 Mbps							
Protocols	Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, SNMP, HTTP, CGI, SNTP, SMTP							
Serial								
Ports (Connector)	2 (RJ45)							
Interface	RS-232/422/485 software-selectable							
Protocols	Modbus/RTU (master/gateway), serial tunnel mode (client/server)							
Environmental Limits								
Standard Operating Temp.	-10 to 60°C (14 to 140°F)							
Wide Operating Temp.	-30 to 70°C (-22 to 158°F)			-40 to 75°C (-40 to 167°F)	-30 to 70°C (-22 to 158°F)			-40 to 75°C (-40 to 167°F)
Storage Temp.	-40 to 85°C (-40 to 185°F)							
Ambient Relative Humidity	5 to 95% (non-condensing)							
Software								
Click&Go Plus	✓	✓	✓	✓	✓	✓	✓	✓
MX-AOPC UA Server	✓	✓	✓	✓	✓	✓	✓	✓
MX-AOPC UA Logger (Data Complement)	✓	✓	✓	✓	✓	✓	✓	✓
MXIO	✓	✓	✓	✓	✓	✓	✓	✓
IOxpress	✓	✓	✓	✓	✓	✓	✓	✓
Standards and Certifications								
Safety	UL 508							
EMC	EN 55022; EN 55024; EN 61000-6-2; EN 61000-6-4							
EMI	CISPR 22, FCC Part 15B Class A							
EMS	EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8							
Shock	IEC 60068-2-27							
Vibration	IEC 60068-2-6							
Radio	R&TTE; NCC		R&TTE; NCC; VCCI	–	R&TTE; NCC		R&TTE; NCC; VCCI	–
Hazardous Location	Class I Division 2, ATEX Zone 2							
Green Product	RoHS, CRoHS, WEEE							
Reliability								
Warranty	5 years							
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Smart Remote I/O with Click&Go Logic

	ioLogik E2210	ioLogik E2212	ioLogik E2214	ioLogik E2240	ioLogik E2242	ioLogik E2260	ioLogik E2262	ioLogik W5340-HSPA
Inputs/Outputs								
Digital Inputs	12	8	6	–	–	–	–	–
Digital Outputs	8	8	–	–	–	4	4	–
Relays	–	–	6	–	–	–	–	2
Configurable DIOs	–	4	–	–	12	–	–	8
Analog Inputs	–	–	–	8	4	–	–	4
Analog Outputs	–	–	–	2	–	–	–	–
RTDs	–	–	–	–	–	6	–	–
Thermocouples	–	–	–	–	–	–	8	–
Ethernet								
Ports (Connector)	1 (RJ45)							1, with up to 3 ioLogik E1200 units daisy-chained (RJ45)
Speed	10/100 Mbps							
Protocols	Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, SNMP, HTTP, CGI, SNTP, SMTP							Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, SNMP, SNTP, SMTP
Serial								
Ports (Connector)	1 (Euroblock terminal)							1 (DB9 male or Euroblock terminal)
Interface	RS-485							RS-232/422/485 software-selectable
Protocols	Modbus/RTU (gateway)							Modbus/RTU (master/gateway), serial tunnel mode (client/server)
Environmental Limits								
Standard Operating Temp.	-10 to 60°C (14 to 140°F)							-10 to 55°C (14 to 131°F)
Wide Operating Temp.	-40 to 75°C (-40 to 167°F)							-30 to 70°C (-22 to 158°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)							
Ambient Relative Humidity	5 to 95% RH (non-condensing)							
Software								
Click&Go	✓	✓	✓	✓	✓	✓	✓	✓
Active OPC Server	✓	✓	✓	✓	✓	✓	✓	✓
MX-AOPC UA Server	✓	✓	✓	✓	✓	✓	✓	✓
DA-Center (Data Complement)	–	–	–	–	–	–	–	✓
MXIO	✓	✓	✓	✓	✓	✓	✓	✓
ioAdmin	✓	✓	✓	✓	✓	✓	✓	✓
Standards and Certifications								
Safety	UL 508							
EMC	EN 61000-6-2; EN 61000-6-4							
EMI	CISPR 22, FCC Part 15B Class A							
EMS	EN 61000-4-2; EN 61000-4-3; EN 61000-4-4; EN 61000-4-5; EN 61000-4-6; EN 61000-4-8							
Shock	IEC 60068-2-27							
Vibration	IEC 60068-2-6							
Radio	–	–	–	–	–	–	–	R&TTE; NCC
Green Product	RoHS, CRoHS, WEEE							
Reliability								
Warranty	5 years	5 years	2 years*	5 years	5 years	5 years	5 years	2 years*
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*Because of the limited lifetime of power relays, products using that component are covered by a 2-year warranty.

ioLogik 2500 HSPA/GPRS/WLAN Series

Smart wireless remote I/O with Click&Go Plus Logic

- Front-end intelligence with Click&Go Plus control logic, up to 48 rules
- Using Cellular Data Access software, SCADA systems can directly communicate with cellular devices hidden behind private IP addresses
- Active communication with MX-AOPC UA Server
- Automatically complement disconnection period data with MX-AOPC UA Logger software
- 4-port unmanaged switch built in for linking to Ethernet devices
- I/O expansion port for daisy chaining up to 8 ioLogik E1200 units
- 3-in-1 RS-232/422/485 serial port for connecting to serial devices in the field
- Simplify I/O management with MXIO library for Windows or Linux
- Wide operating temperature range of -30 to 70°C (-22 to 158°F)

CLICK&GO LOGIC

Introduction

The ioLogik 2500 is a smart remote I/O product with unique hardware and software designs, making it an ideal solution for a variety of industrial data acquisition applications.

The ioLogik 2500 HSPA/GPRS series features dual SIM failover, 3-step cellular reconnection, and dynamic IP access. The WLAN series features 802.11a/b/g reliable wireless communication.

The ioLogik 2500's hardware design includes a 4-port unmanaged Ethernet switch and 2 serial ports, enabling the ioLogik 2500 to seamlessly connect to a variety of field devices. One of the Ethernet ports can be used to link to 8 daisy-chained ioLogik E1200 expansion modules to provide more than 100 channels. The ioLogik 2500 acts as the "head" unit, with Click&Go Plus logic used to control the entire I/O array. Most importantly, the ioLogik 2500's single IP is all that's required to connect the entire I/O array to your network, providing the perfect solution for industrial field sites that have an insufficient number of IP addresses.

Dual SIM Failover

The ioLogik 2500 HSPA/GPRS series has dual SIM slots for inserting SIM cards from different carriers. It can switch over to a different carrier automatically when one of the cellular networks gets disconnected, ensuring that your device will always be online.

3-step Cellular Reconnection

If the cellular network is still disconnected after dual SIM failover, the ioLogik 2500 series will first try to reset the cellular modem, then reset the system software if it is still not working, and lastly reboot the entire system after being disconnected for a user-defined period of time.

Based on Moxa's experience, 90% of cellular connection issues can be solved by resetting the cellular modem. 3-step cellular reconnection not only helps prevent data and control loss, but also reduces your cost since your engineers won't need to make as many service calls to reboot devices located at remote sites.

Dynamic IP Access

Most carriers provide dynamic and private IP address SIM cards, and although private IP cards are cheaper, they cannot be used to provide direct access to the cloud. Moxa's Cellular Data Access software enables this type of connection by establishing a special data route between the ioLogik 2500 HSPA/GPRS series and the cloud. Only one public IP address is needed to use Moxa's Cellular Data Access software, allowing you to easily update internal register values, change output channel status, and modify the configurations of devices connected to an ioLogik 2500, all through the cloud.

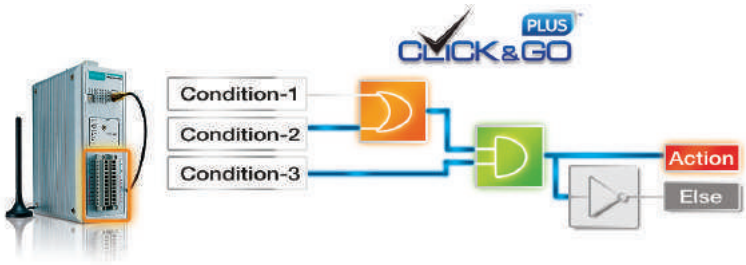
VPN—Build a Reliable and Secure Cellular Communication Network

For security purposes, the ioLogik 2500-GPRS/HSPA also supports IPSec for building a secure VPN tunnel to the host station. With the help of VPNs, cellular devices acting as a VPN client can initiate a connection with a VPN server. Once the connection is established, cellular devices can communicate with other network devices on the same private network.

Powerful Control Logic from the New Click&Go Plus™

The new Click&Go Plus™ control logic now supports up to 48 rules with further upgrades to 8 conditions/actions. In addition, its graphical user interface provides 3 logic gates and 3 multi-layers, helping you build more powerful and efficient IO solutions.

Once you finish setting up your Click&Go Plus™ logic rules, IOxpress's easy-to-use simulation function can be used to find potential errors in your Click&Go Plus™ rules before uploading them to your online devices.



One IP for Multiple Expansion I/Os Gives You a Smarter Data Acquisition Solution

The ioLogik 2500's unique IO expansion hardware design lets you link up to 8 ioLogik E1200 modules into a versatile I/O array with 100+ different I/O channels. The ioLogik 2500 acts as the perfect "head" unit, using Click&Go Plus logic to control the entire I/O array, and providing a single IP to connect the entire I/O array to your network.

ioLogik 2512 Specifications

Inputs and Outputs

Digital Inputs: 8 channels
Configurable DIOs (by software): 8 channels
Isolation: 3k VDC or 2k Vrms

Digital Input

Sensor Type: Wet Contact (NPN or PNP) and Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to COM):
• On: 10 to 30 VDC
• Off: 0 to 3 VDC
Common Type: 8 points per COM
Counter Frequency: 2.5 kHz
Digital Filtering Time Interval: Software configurable

Digital Output

Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 5 kHz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 1.5 A per channel @ 25°C
Over-Temperature Shutdown: 175°C (min.)
Current Rating: 500 mA per channel @ 25°C
DIO Output Leakage Current: < 1 mA @ 30 VDC

Power Requirements

Input Voltage: 9 to 48 VDC
Input Current:
• HSPA Model: 390 mA @ 24 VDC
• GPRS Model: 416 mA @ 24 VDC
• WL1 Model: 328 mA @ 24 VDC

MTBF (mean time between failures)

Time:
• HSPA model: 378,154 hrs
• GPRS model: 403,452 hrs
• WL1 model: 400,469 hrs
Standard: Telcordia SR332

ioLogik 2542 Specifications

Inputs and Outputs

Configurable DIOs (by software): 12 channels
Analog Inputs: 4 channels
Isolation: 3k VDC or 2k Vrms

Digital Input

Sensor Type: Wet Contact (NPN or PNP) and Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to COM):
• On: 10 to 30 VDC
• Off: 0 to 3 VDC
Common Type: 6 points per COM
Counter Frequency: 2.5 kHz
Digital Filtering Time Interval: Software configurable

Digital Output

Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 5 kHz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 1.5 A per channel @ 25°C
Over-Temperature Shutdown: 175°C (min.)
Current Rating: 500 mA per channel @ 25°C
DIO Output Leakage Current: < 1 mA @ 30 VDC

Analog Input

Type: Differential input
Resolution: 16 bits
I/O Mode: Voltage / Current (software selectable)
Input Range: ±10 V, 0 to 10 V, 0 to 20 mA, 4 to 20 mA, 4 to 20 mA (burnout detection)
Accuracy:
• ±0.1% FSR @ 25°C
• ±0.3% FSR @ -10 and 60°C
• ±0.5% FSR @ -30 and 70°C
Sampling Rate:
• All channels: 400 samples/sec
• Per channel: 100 samples/sec
Input Impedance: 1M ohms (min.)
Built-in Resistor for Current Input: 120 ohms

Power Requirements

Input Voltage: 9 to 48 VDC
Input Current:
• HSPA Model: 442 mA @ 24 VDC
• GPRS Model: 494 mA @ 24 VDC
• WL1 Model: 406 mA @ 24 VDC

MTBF (mean time between failures)

Time:
• HSPA model: 378,154 hrs
• GPRS model: 403,087 hrs
• WL1 model: 331,222 hrs
Standard: Telcordia SR332

Common Specifications

Cellular

Standards: GSM/GPRS/EDGE/UMTS/HSPA+
HSPA Model Band Options:
• UMTS/HSPA+: five-band 800/850/900/1900/2100 MHz
• GSM/GPRS/EDGE: quad-band 850/900/1800/1900 MHz
GPRS Model Band Options: GSM/GPRS/EDGE: quad-band 850/900/1800/1900 MHz
SIM Control Voltage: 3/1.8 V
SIM Format: Full size

WLAN

Standards:
• IEEE 802.11a/b/g for wireless LAN
• IEEE 802.11i for wireless security
Spread Spectrum and Modulation (typical):
• DSSS with DBPSK, DQPSK, CCK
• OFDM with BPSK, QPSK, 16QAM, 64QAM
• 802.11b: CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBPSK @ 11 Mbps
• 802.11a/g: 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps

Operating Channels (central frequency):
• US: 2.412 to 2.462 GHz (11 channels), 5.18 to 5.24 GHz (4 channels)
• EU: 2.412 to 2.472 GHz (13 channels), 5.18 to 5.24 GHz (4 channels)
Security:
• 64-bit and 128-bit WEP encryption
• Full WPA/WPA2 Personal
Transmission Rates:
• 802.11b: 1, 2, 5.5, 11 Mbps
• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
TX Transmit Power:
• 802.11b: Typ. 18±1.5 dBm @ 1 to 11 Mbps
• 802.11g: Typ. 18±1.5 dBm @ 6 to 24 Mbps, Typ. 17±1.5 dBm @ 36 Mbps, Typ. 16±1.5 dBm @ 48 Mbps, Typ. 16±1.5 dBm @ 54 Mbps
• 802.11a: Typ. 18±1.5 dBm @ 6 to 24 Mbps, Typ. 16±1.5 dBm @ 36 Mbps, Typ. 15±1.5 dBm @ 48 Mbps, Typ. 14±1.5 dBm @ 54 Mbps
RX Sensitivity:
• 802.11b: -97 dBm @ 1 Mbps, -94 dBm @ 2 Mbps, -92 dBm @ 5.5 Mbps, -90 dBm @ 11 Mbps
• 802.11g: -88 dBm @ 6 to 24 Mbps, -85 dBm @ 36 Mbps, -75 dBm @ 48 Mbps, -70 dBm @ 54 Mbps
• 802.11a: -88 dBm @ 6 to 24 Mbps, -85 dBm @ 36 Mbps, -75 dBm @ 48 Mbps, -70 dBm @ 54 Mbps

LAN

Ethernet:
• 4 switched 10/100 Mbps RJ45 ports
• 1 optimized port for faster downstream communications with daisy-chained ioLogik E1200 units
Note: The optimized daisy-chain port is not supported by the ioLogik E1261W-T, E1261H-T, or E1263H-T.
Protection: 1.5 kV magnetic isolation
Protocols: Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, SNMP, HTTP, CGI, SNTP, SMTP

Serial

Interface: 2 RS-232/422/485 (software selectable) RJ45 ports
Parity: None, Odd, Even
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 2
Flow Control: None, RTS/CTS, XON/XOFF
Baudrate: 300 to 115200 bps
Protocols: Modbus/RTU (master/gateway), serial tunnel mode (client/server)

Physical Characteristics

Wiring: I/O cable, 14 AWG (max.)
Dimensions: 61 x 157 x 115 mm (2.4 x 6.18 x 4.53 in)
Weight: Under 1265 g (2.79 lb)
Mounting: DIN rail (standard), wall (optional)

Storage

Expansion Slot: Up to 32 GB microSD™ memory card (SDHC compatible)
Note: For units operating in extreme temperatures, industrial-grade, wide-temperature SD cards are required.

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -30 to 70°C (-22 to 158°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
Altitude: Up to 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

Standards and Certifications

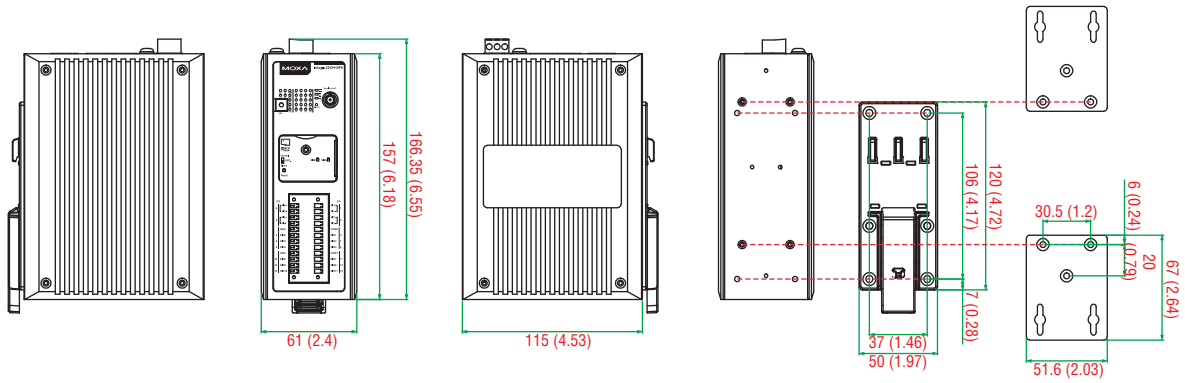
Safety: UL 508
EMC: EN 55022/24, EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power 2 kV
IEC 61000-4-6 CS: 3 V
IEC 61000-4-8
Radio: R&TTE: EN 62311, EN 300 328, EN 301 489-1, EN 301 489-17, EN 301 893; NCC; VCCI
Hazardous Location: Class 1 Division 2; ATEX Zone 2
Green Product: RoHS, CRoHS, WEEE
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

ioLogik 2512-GPRS: Smart GPRS remote I/O with Click&Go Plus, 8 DIs, 8 DIOs, -10 to 60°C operating temperature
ioLogik 2512-GPRS-T: Smart GPRS remote I/O with Click&Go Plus, 8 DIs, 8 DIOs, -30 to 70°C operating temperature
ioLogik 2512-HSPA: Smart HSPA remote I/O with Click&Go Plus, 8 DIs, 8 DIOs, -10 to 60°C operating temperature
ioLogik 2512-HSPA-T: Smart HSPA remote I/O with Click&Go Plus, 8 DIs, 8 DIOs, -30 to 70°C operating temperature
ioLogik 2512-WL1: Smart WLAN remote I/O with Click&Go Plus, 8 DIs, 8 DIOs, -10 to 60°C operating temperature
ioLogik 2512-WL1-T: Smart WLAN remote I/O with Click&Go Plus, 8 DIs, 8 DIOs, -30 to 70°C operating temperature
ioLogik 2542-GPRS: Smart GPRS remote I/O with Click&Go Plus, 12 DIOs, 4 AIs, -10 to 60°C operating temperature
ioLogik 2542-GPRS-T: Smart GPRS remote I/O with Click&Go Plus, 12 DIOs, 4 AIs, -30 to 70°C operating temperature
ioLogik 2542-HSPA: Smart HSPA remote I/O with Click&Go Plus, 12 DIOs, 4 AIs, -10 to 60°C operating temperature
ioLogik 2542-HSPA-T: Smart HSPA remote I/O with Click&Go Plus, 12 DIOs, 4 AIs, -30 to 70°C operating temperature
ioLogik 2542-WL1: Smart WLAN remote I/O with Click&Go Plus, 12 DIOs, 4 AIs, -10 to 60°C operating temperature
ioLogik 2542-WL1-T: Smart WLAN remote I/O with Click&Go Plus, 12 DIOs, 4 AIs, -30 to 70°C operating temperature

Optional Accessories (can be purchased separately)

WK-51-01: DIN-rail/wall-mounting kit, 2 plates with 6 screws

Package Checklist

- ioLogik 2500
- RJ45-to-DB9 connection cables x 2
- Documentation and software CD
- Antennas x 1
- Hardware installation guide

ioLogik W5340-HSPA

Smart HSPA remote I/O with Click&Go Logic

- Front-end intelligence with patented Click&Go control logic, up to 24 rules
- Using Active OPC Server software, SCADA systems can directly communicate with cellular devices hidden behind private IP addresses
- Active communication with Active OPC Server
- Automatically complement disconnection period data with DA-Center software
- Daisy chain up to 3 ioLogik E1200 units
- 3-in-1 RS-232/422/485 serial port for connecting to serial devices in the field
- Supports SNMPv1/v2c
- Simplify I/O management with MXIO library for Windows or Linux platforms
- Wide operating temperature range of -30 to 70°C (-22 to 158°F)

Introduction

The ioLogik W5340-HSPA is a hardy, metal-encased remote I/O unit that combines an HSPA cellular modem, a remote I/O module, and a data logger for use in a wide variety of innovative I/O applications. The ioLogik W5340-HSPA also supports Moxa's patented Click&Go programming interface, giving engineers a powerful, simple tool that streamlines installation and setup into a nearly effortless process.

The ioLogik W5340-HSPA delivers local data logging in a storage space expandable up to 32 GB, and comes with Moxa's innovative, patented MX-AOPC UA Server or Active OPC Server software to transform network communications from centralized polling by the control system to event-based notifications that originate at the edge.

By eliminating constant polling, communications can be brought up to real-time speeds while reducing hardware costs and overall network overhead.

The ioLogik W5340-HSPA provides benefits beyond mere cellular connectivity and remote input/output management; it is an ideal solution for any number of industrial applications, including:

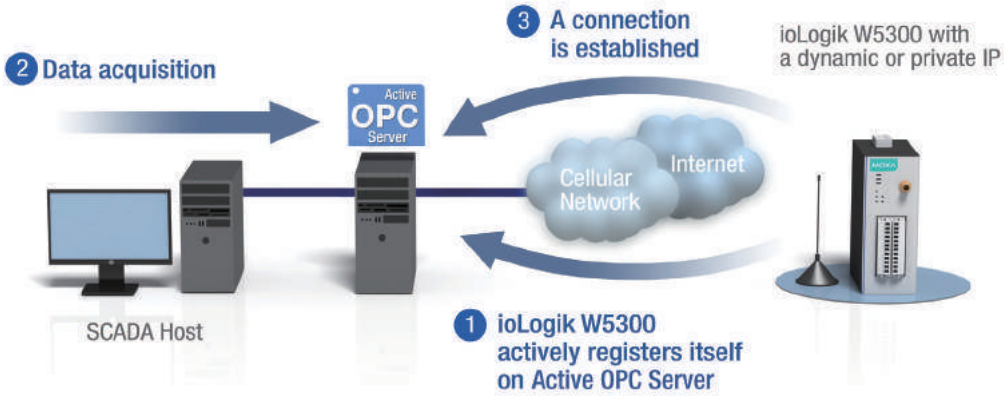
- Pipeline monitoring for water, oil, and gas facilities
- Pump station and lift station monitoring
- Environmental monitoring
- Security and surveillance

Automatic Data Updates from SD Cards Following Network Failures

When Active OPC Server is used in combination with DA-Center, then following any network failure an ioLogik W5340-HSPA remote client will, upon reconnecting, restore to the central database any data that was accumulated during the downtime. Following a network failure, DA-Center will compare received data stored in the database with the historical data stored locally on the ioLogik W5340-HSPA. If there are any gaps in the database record, DA-Center will restore the missing data by requesting re-transmission from the remote ioLogik client.

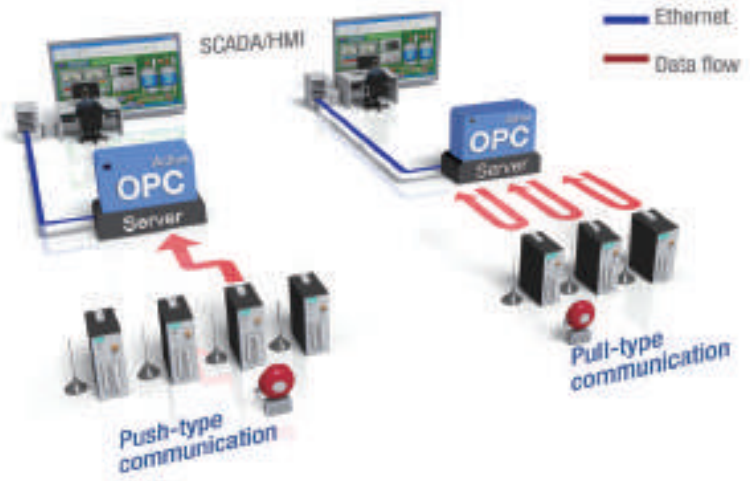
Dynamic IP Assignments

For most cellular solutions, each remote modem is assigned a static public IP when it first associates with a network, and this often causes big headaches when automating devices over cellular connections. Cellular network carriers charge higher monthly fees for static, public IPs than they do for dynamic, private IPs. Moxa's ioLogik W5340-HSPA and patented Active OPC Server allow users to implement dynamic IP assignments for the ioLogik W5340-HSPA. The ioLogik W5340-HSPA can automatically establish communications with the ioLogik W5340-HSPA Server using a fixed IP, and the Active OPC Server will receive and register the ioLogik W5300's IP address and receive or record tag updates accordingly.



Faster, More Accurate Serial Data Collection than Traditional Polling Architectures

The ioLogik W5340-HSPA is equipped with a 3-in-1 serial port that supports RS-232, RS-422, and RS-485, making it more convenient than ever (and saving users money) when connecting field serial devices. ioLogik W5340-HSPA remote I/O units can also create user-defined Modbus tags for conveniently ordering and storing data from remote meters and flow sensors, and then take the initiative to actively update the central MX-AOPC UA Server with the latest tagged data. This results in faster I/O response times and more accurate data collection. Finally, the ioLogik W5340-HSPA uses remote I/O methodology to build transparent serial tunnels for Modbus RTU communications over TCP/IP, allowing for direct connectivity between field devices and central control systems over either cellular wireless or wired Ethernet interfaces.



I/O Expandability

The ioLogik W5340-HSPA comes with a single RJ45 Ethernet port so that it can be linked together with Moxa's ioLogik E1200 units in a daisy-chain network, giving engineers a simple, cost-effective means of extending their I/O capabilities with full peer-to-peer communications. The ioLogik W5340-HSPA can support up to three ioLogik E1200 series I/O devices, which can then be installed to whichever locations are most convenient and effective for the needs of the local station.

Specifications

LAN
Ethernet: 1 10/100 Mbps RJ45 port, with up to 3 ioLogik E1200 units daisy-chained
Protection: 1.5 kV magnetic isolation
Protocols: Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, SNMP, SNTP

Serial
Interface: 1 RS-232/422/485 (software selectable) DB9 male or terminal block port
Parity: None, Odd, Even, Space, Mark
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 2
Flow Control: None, Hardware, XON/XOFF
Baudrate: 300 to 115200 bps
Protocols: Modbus/RTU (master/gateway), serial tunnel mode (client/server)

Inputs and Outputs
Configurable DIOs (by software): 8 channels
Relays: 2 channels
Analog Inputs: 4 channels
Isolation: 3k VDC or 2k Vrms

Digital Input
Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to GND):
• On: 0 to 3 VDC
• Off: 10 to 30 VDC
Common Type: 4 points per COM
Counter Frequency: 900 Hz
Digital Filtering Time Interval: Software configurable

Digital Output
Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 1 kHz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 160°C (min.)
Current Rating: 200 mA per channel
DIO Output Leakage Current: 3.6 mA @ 24 VDC

Relay
Type: Form A (N.O.) power relay
Contact Current Rating: Resistive Load: 1 A @ 30 VDC, 250 VAC, 110 VAC
Initial Insulation Resistance: 1000 micro-ohms (min.) @ 500 VDC
Mechanical Endurance: 5,000,000 operations
Electrical Endurance: 600,000 operations @ 1 A resistive load
Contact Resistance: 100 milli-ohms (max.)
Pulse Output: 0.3 Hz at rated load
Note: Ambient humidity must be non-condensing and remain between 5 and 95%. The relays of the ioLogik W5340-HSPA may malfunction when operating in high condensation environments below 0° Celsius.

Analog Input
Type: Differential input
Resolution: 16 bits
I/O Mode: Voltage / Current (software selectable)
Input Range: 0 to 10 V, ±10 V, ±5 V, 0 to 20 mA, 4 to 20 mA
Accuracy:
• ±0.1% FSR @ 25°C
• ±0.3% FSR @ -30 and 70°C
Sampling Rate:
All channels: 32 samples/sec
Per channel: 8 samples/sec
Single channel: 100 samples/sec
Input Impedance: 200k ohms (min.)
Built-in Resistor for Current Input: 120 ohms

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 196 mA @ 24 VDC

Physical Characteristics
Wiring: I/O cable, 14 AWG (max.)
Dimensions: 46.8 x 135 x 105 mm (1.84 x 5.31 x 4.13 in)
Weight: 495 g (1.09 lb)
Mounting: DIN rail (standard), wall (optional)

Storage
Expansion Slot: Up to 32 GB SD™ memory card (SD 2.0 compatible)
Note: For units operating in extreme temperatures, industrial-grade, wide temperature SD cards are required.

Environmental Limits
Operating Temperature:
Standard Models: -10 to 55°C (14 to 131°F)
Wide Temp. Models: -30 to 70°C (-22 to 158°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
Altitude: Up to 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

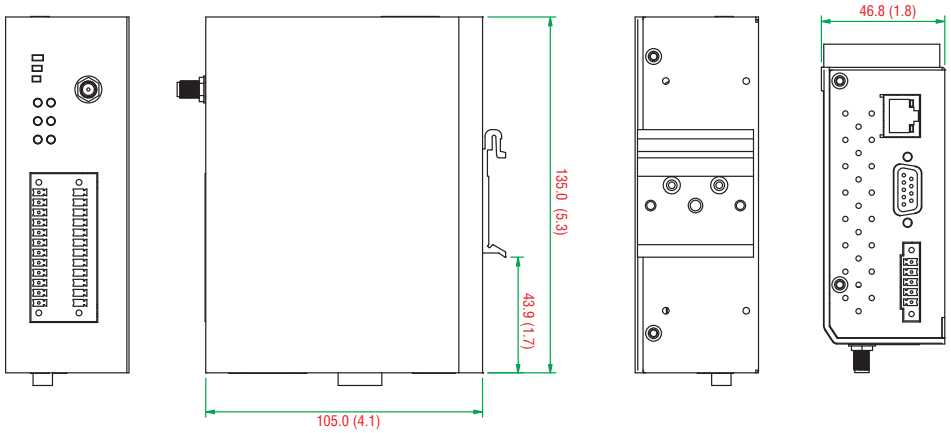
Standards and Certifications
Safety: UL 508, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: Signal: 3 V/m
IEC 61000-4-8 Magnetic Field: 1 A/m
Radio: R&TTE: EN 301 489-1, EN 301 489-7, EN 301 489-24, EN 301 511, EN 301 908-1; NCC
Green Product: RoHS, CRoHS, WEEE
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)
Time: 280,739 hrs
Standard: Telcordia SR332

Warranty
Warranty Period: 2 years*
Details: See www.moxa.com/warranty
*Because of the limited lifetime of power relays, products that use that component are covered by a 2-year warranty.

Dimensions

Unit: mm (inch)



Front View | Side View | Rear View | Top View

Ordering Information

Available Models

ioLogik W5340-HSPA: Smart HSPA remote I/O with 8 DIOs, 2 relays, 4 AIs, -10 to 55°C operating temperature

ioLogik W5340-HSPA-T: Smart HSPA remote I/O with 8 DIOs, 2 relays, 4 AIs, -30 to 70°C operating temperature

Optional Accessories (can be purchased separately)

WK-46: DIN-rail/wall-mounting kit, 2 plates with 6 screws

Package Checklist

- ioLogik W5340-HSPA
- Five-band omnidirectional antenna for GSM/GPRS/UMTS/ HSPA/HSPA+, 4 dBi, magnetic SMA, 2.5 meters
- Documentation and software CD

ioLogik 2500 Ethernet Series

Smart Ethernet remote I/O with Click&Go Plus Logic

- Front-end intelligence with Click&Go Plus control logic, up to 48 rules
- Active communication with MX-AOPC UA Server
- Automatically complement disconnection period data with MX-AOPC UA Logger software
- 4-port unmanaged switch built in for linking to Ethernet devices
- I/O expansion port for daisy chaining up to 8 ioLogik E1200 units
- 3-in-1 RS-232/422/485 serial port for connecting to serial devices in the field
- Supports SNMPv1/v2c/v3
- Simplify I/O management with MXIO library for Windows or Linux platforms
- Wide operating temperature range of -40 to 75°C (-40 to 167°F)

Introduction

The ioLogik 2500 is a smart remote I/O product with unique hardware and software designs, making it an ideal solution for a variety of industrial data acquisition applications.

The ioLogik 2500's hardware design includes a 4-port unmanaged Ethernet switch and 2 serial ports, enabling the ioLogik 2500 to seamlessly connect to a variety of field devices. One of the Ethernet ports can be used to link to 8 daisy-chained ioLogik E1200 expansion modules to provide more than 100 channels. The ioLogik 2500 acts as the "head" unit, with Click&Go Plus logic used to control the entire I/O array. Most importantly, the ioLogik 2500's single IP is all that's required to connect the entire I/O array to your network, providing the perfect solution for industrial field sites that have an insufficient number of IP addresses.

Powerful Control Logic from the New Click&Go Plus™

The new Click&Go Plus™ control logic now supports up to 48 rules with further upgrades to 8 conditions/actions. In addition, its graphical user interface provides 3 logic gates and 3 multi-layers, helping you build more powerful and efficient IO solutions.

Once you finish setting up your Click&Go Plus™ logic rules, IOxpress's easy-to-use simulation function can be used to find potential errors in your Click&Go Plus™ rules before uploading them to your online devices.

Peer-to-peer (P2P) mode is widely used for industrial applications. Traditionally, you would need to use P2P devices on both sides of the connection. However, if a configuration mismatch occurred between the P2P devices, the P2P connection would fail, after which you would need to spend extra time and effort to check the P2P settings. With IOxpress, all you need to do is set up the output device, and the P2P connection will be established automatically.

One IP for Multiple Expansion I/Os Gives You a Smarter Data Acquisition Solution

The ioLogik 2500's unique IO expansion hardware design lets you link up to 8 ioLogik E1200 modules into a versatile I/O array with 100+ different I/O channels. The ioLogik 2500 acts as the perfect "head" unit, using Click&Go Plus logic to control the entire I/O array, and providing a single IP to connect the entire I/O array to your network.

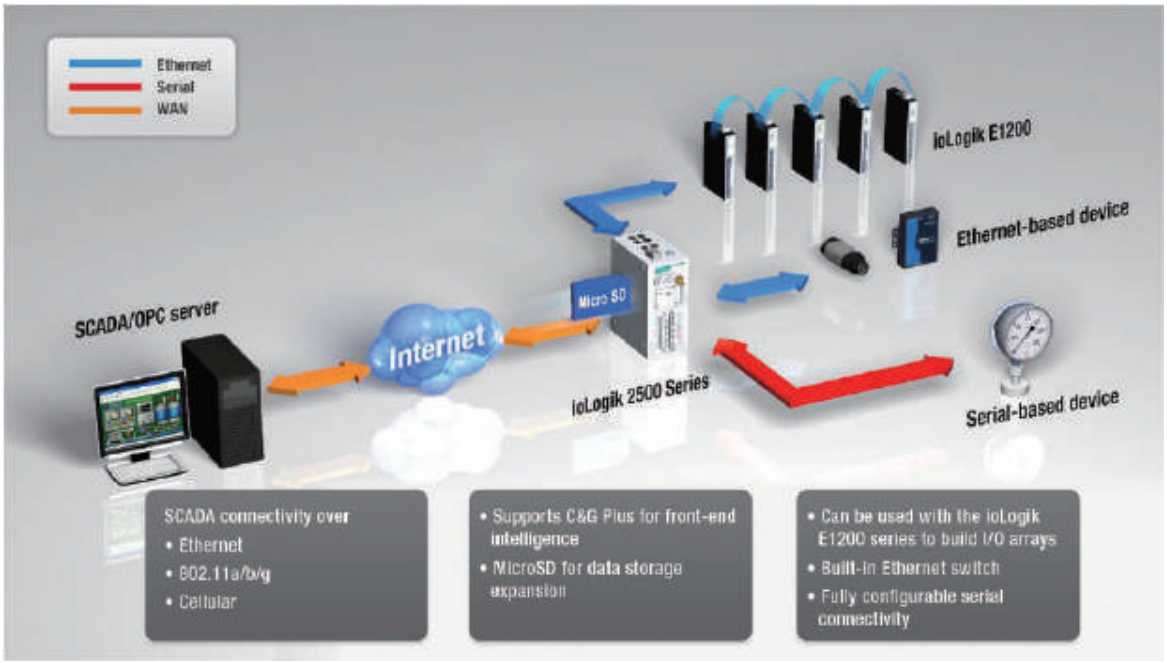
Powerful Datalogger and Value-added MODBUS Gateway

The ioLogik 2500 Series supports micro SD cards with up to 32 GB of memory, turning the ioLogik into a powerful datalogger for storing valuable data. And with a built-in FTP server, important data from field sites can be accessed remotely by different systems. In addition, the 2 serial communication ports can be used to input data from devices using the Modbus RTU protocol, and then transform the data into Modbus TCP or AOPC tag format before sending it out over the Ethernet network.

New MX-AOPC UA Server Efficiently Reduces System Response Time

The new MX-AOPC UA supports both UA server and DA server types. MX-AOPC UA server has a number of strengths. UA server provides a standard, state of the art security model, assuring your system's security, and supports communication channels via the standard UA TCP port. This means that messages can be relayed through third party proxies. In addition, configuring the firewall is be easier, since you won't need to worry about DCOM settings.

In addition, MX-AOPC supports both the traditional Modbus protocol and Moxa's patented Push type communication. Unlike the traditional passive "pull" method, "active" messages are automatically "pushed" from the ioLogik 2500 to the SCADA system when the I/O state changes or pre-configured events occur. In this way, information can be accurately and efficiently pushed to the SCADA system as it becomes available.



ioLogik 2512 Specifications

Inputs and Outputs
Digital Inputs: 8 channels
Configurable DIOs (by software): 8 channels
Isolation: 3k VDC or 2k Vrms

Digital Input
Sensor Type: Wet Contact (NPN or PNP) and Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to COM):
• On: 10 to 30 VDC
• Off: 0 to 3 VDC
Common Type: 8 points per COM
Counter Frequency: 2.5 kHz
Digital Filtering Time Interval: Software configurable

Digital Output
Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 5 kHz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 1.5 A per channel @ 25°C
Over-Temperature Shutdown: 175°C (min.)
Current Rating: 500 mA per channel @ 25°C
DIO Output Leakage Current: < 1 mA @ 30 VDC

Power Requirements
Input Voltage: 9 to 48 VDC
Input Current: 274 mA @ 24 VDC

MTBF (mean time between failures)
Time: 467,032 hrs
Standard: Telcordia SR332

ioLogik 2542 Specifications

Inputs and Outputs
Configurable DIOs (by software): 12 channels
Analog Inputs: 4 channels
Isolation: 3k VDC or 2k Vrms

Digital Input
Sensor Type: Wet Contact (NPN or PNP) and Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to COM):
• On: 10 to 30 VDC
• Off: 0 to 3 VDC
Common Type: 6 points per COM
Counter Frequency: 2.5 kHz
Digital Filtering Time Interval: Software configurable

Digital Output
Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 5 kHz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 1.5 A per channel @ 25°C
Over-Temperature Shutdown: 175°C (min.)
Current Rating: 500 mA per channel @ 25°C
DIO Output Leakage Current: < 1 mA @ 30 VDC

Analog Input
Type: Differential input
Resolution: 16 bits
I/O Mode: Voltage / Current (software selectable)
Input Range: ±10 V, 0 to 10 V, 0 to 20 mA, 4 to 20 mA, 4 to 20 mA (burnout detection)
Accuracy:
• ±0.1% FSR @ 25°C
• ±0.3% FSR @ -10 and 60°C
• ±0.5% FSR @ -30 and 70°C
Sampling Rate:
• All channels: 400 samples/sec
• Per channel: 100 samples/sec
Input Impedance: 1 mega-ohm (min.)
Built-in Resistor for Current Input: 120 ohms

Power Requirements
Input Voltage: 9 to 48 VDC
Input Current: 358 mA @ 24 VDC

MTBF (mean time between failures)
Time: 375,439 hrs
Standard: Telcordia SR332

Common Specifications

LAN
Ethernet:
• 4 switched 10/100 Mbps RJ45 ports
• 1 optimized port for faster downstream communications with daisy-chained ioLogik E1200 units
Note: The optimized daisy-chain port is not supported by the ioLogik E1261W-T, E1261H-T, or E1263H-T.
Protection: 1.5 kV magnetic isolation
Protocols: Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, SNMP, HTTP, CGI, SNTP, SMTP

Serial
Interface: 2 RS-232/422/485 (software selectable) RJ45 ports
Parity: None, Odd, Even
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 2
Flow Control: None, RTS/CTS, XON/XOFF
Baudrate: 300 to 115200 bps
Protocols: Modbus/RTU (master/gateway), serial tunnel mode (client/server)

Physical Characteristics
Wiring: I/O cable max. 14 AWG
Dimensions: 61 x 157 x 115 mm (2.4 x 6.18 x 4.53 in)
Weight: Under 1265 g (2.79 lb)
Mounting: DIN-rail (standard), wall (with optional kit)

Storage
Expansion Slot: Up to 32 GB microSD™ memory card (SDHC compatible)
Note: For units operating in extreme temperatures, industrial-grade, wide-temperature SD cards are required.

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
Altitude: Up to 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24, EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 1 kV
IEC 61000-4-6 CS: 3 V
IEC 61000-4-8

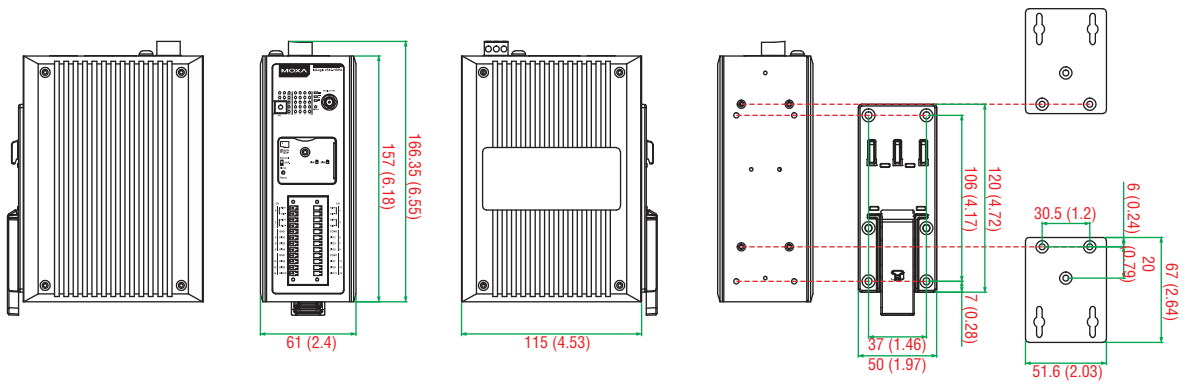
Hazardous Location: Class 1 Division 2; ATEX Zone 2
Green Product: RoHS, CRoHS, WEEE
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

ioLogik 2512: Smart Ethernet remote I/O with Click&Go Plus, 8 DIs, 8 DIOs, -10 to 60°C operating temperature
ioLogik 2512-T: Smart Ethernet remote I/O with Click&Go Plus, 8 DIs, 8 DIOs, -40 to 75°C operating temperature
ioLogik 2542: Smart Ethernet remote I/O with Click&Go Plus, 12 DIOs, 4 AIs, -10 to 60°C operating temperature
ioLogik 2542-T: Smart Ethernet remote I/O with Click&Go Plus, 12 DIOs, 4 AIs, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

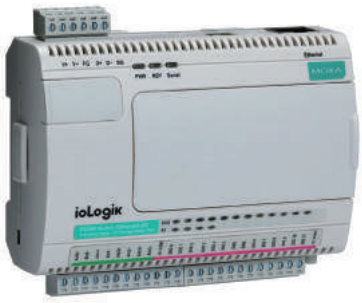
WK-51-01: DIN-rail/wall-mounting kit, 2 plates with 6 screws

Package Checklist

- ioLogik 2500
- RJ45-to-DB9 connection cables x 2
- Documentation and software CD
- Hardware installation guide

ioLogik E2200 Series

Smart Ethernet remote I/O with Click&GO Logic



- Front-end intelligence with patented Click&Go control logic, up to 24 rules
- Active communication with MX-AOPC UA Server
- Save time and wiring cost with peer-to-peer communication
- Supports SNMPv1/v2c/v3
- Friendly configuration via web browser
- Simplify I/O management with MXIO library for Windows or Linux platforms
- Wide operating temperature range of -40 to 75°C (-40 to 167°F)

CLICK&GO LOGIC

RoHS c UL us LISTED CE FC

Introduction

Moxa's ioLogik E2200 Ethernet Remote I/O features the Click&Go programming interface. The ioLogik E2200 is a PC-based data acquisition and control device that uses proactive, event-based reporting to control I/O devices. Unlike traditional PLCs, which are passive and must poll for data, Moxa's ioLogik E2200 series will, when paired with our MX-AOPC UA Server, communicate with SCADA systems using active messaging that is pushed to the server only when state changes or configured events occur. Additionally, the ioLogik E2200 features SNMP for communications and control using an NMS (Network Management System), allowing IT professionals to configure the device to push I/O status reports according to configured specifications. This report-by-exception approach, which is new to PC-based monitoring, requires far less bandwidth than traditional polling methods.

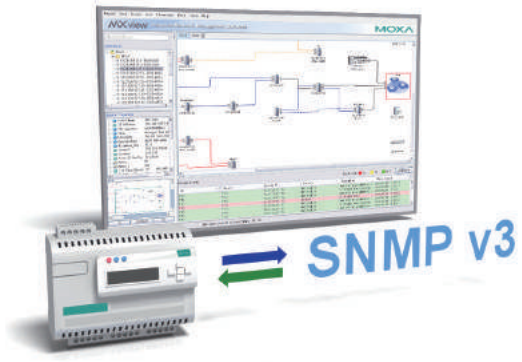
PC-Free Alarm and Control Intelligence

The ioLogik E2200 supports simple and powerful Click&Go™ technology to configure event-driven reports and alarms delivered over email, TCP/UDP, or SNMP traps, giving you a powerful effective, tool for delivering time-stamped status updates in real time.

With built-in Click&Go™ intelligence, the ioLogik E2200 can be configured for simple outputs paired up with simple input triggers without the need for a PC controller. This allows the ioLogik E2200 to be configured to automatically report I/O events according to user-specified conditions.

SNMP Protocol for Ethernet Device Management

In addition to Modbus/TCP, the ioLogik E2200 supports both SNMP and CGI scripting, giving IT engineers familiar tools for controlling and monitoring I/O systems. By using SNMP, IT engineers can configure the ioLogik E2200 to deliver alarms (traps) for specific I/O events, or use it to read or write directly to the I/O registers. For the strongest security, the ioLogik E2200 features SNMP v3, with authentication and encryption. With Moxa's SNMP-capable ioLogik E2200, even IT professionals can easily integrate industrial sensors and servos over an Ethernet backbone, and with its strong network management tools the ioLogik E2200 is ideal for a wide variety of industrial applications, whether in environmental monitoring, telecommunications, power production and delivery, or transportation.



Push Technology for Events and Alarms

The ioLogik E2200 series is designed for use with the Moxa's MX-AOPC UA server. When used with MX-AOPC UA Server, the E2200 is upgraded to use active push communications when communicating state changes and/or events to the SCADA system. Unlike a polling system, when using a push architecture for communications with the SCADA messages will only be delivered when state changes or configured events occur. Active messaging thus allows for big increases in data acquisition and control throughput while also delivering big reductions in network overhead.

ioLogik E2210 Specifications

Inputs and Outputs
Digital Inputs: 12 channels
Digital Outputs: 8 channels
Isolation: 3k VDC or 2k Vrms

Digital Input
Sensor Type: Wet Contact (NPN), Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to GND):
• On: 0 to 3 VDC
• Off: 10 to 30 VDC
Common Type: 12 points per COM
Counter Frequency: 900 Hz
Digital Filtering Time Interval: Software Configurable

Digital Output
Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 1 kHz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C (min.)
Current Rating: 200 mA per channel

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 190 mA @ 24 VDC

MTBF (mean time between failures)
Time: 213,673 hrs
Database: Telcordia SR332

ioLogik E2212 Specifications

Inputs and Outputs
Digital Inputs: 8 channels
Digital Outputs: 8 channels
Configurable DIOs: 4 channels
Isolation: 3k VDC or 2k Vrms

Digital Input
Sensor Type: Wet Contact (NPN or PNP) and Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to GND):
• On: 0 to 3 VDC
• OFF: 10 to 30 VDC
Common Type: 6 points per COM
Counter Frequency: 900 Hz
Digital Filtering Time Interval: Software Configurable

Digital Output
Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 1 kHz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C (min.)
Current Rating: 200 mA per channel

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 136 mA @ 24 VDC

MTBF (mean time between failures)
Time: 217,722 hrs
Database: Telcordia SR332

ioLogik E2214 Specifications

Inputs and Outputs
Digital Inputs: 6 channels
Relay Outputs: 6 channels
Isolation: 3k VDC or 2k Vrms

Digital Input
Sensor Type: Wet Contact (NPN or PNP) and Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to GND):
• On: 0 to 3 VDC
• Off: 10 to 30 VDC
Common Type: 3 points per COM
Counter Frequency: 900 Hz
Digital Filtering Time Interval: Software Configurable

Relay Output
Type: Form A (N.O.) power relay
Contact Current Rating:
• Inductive Load: 2 A @ 30 VDC, 250 VAC, 110 VAC
• Resistive Load: 5 A @ 30 VDC, 250 VAC, 110 VAC
Minimum permitted load: 1 A @ 5 VDC
Initial Insulation Resistance: 1000 mega-ohms (min.) @ 500 VDC
Mechanical Endurance: 1,000,000 operations
Electrical Endurance: 100,000 operations @ 5 A resistive load
Contact Resistance: 100 milli-ohms (max.)
Pulse Output: 0.3 Hz at rated load
Note: Ambient humidity must be non-condensing and remain between 5 and 95%. The relays of the ioLogik E2214 may malfunction when operating in high condensation environments below 0° Celsius.

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 170 mA @ 24 VDC

MTBF (mean time between failures)
Time: 307,239 hrs
Database: Telcordia SR332

ioLogik E2240 Specifications

Inputs and Outputs
Analog Inputs: 8 channels
Analog Outputs: 2 channels

Analog Input
Isolation: 3k VDC or 2k Vrms
Type: Differential input
Resolution: 16 bits
I/O Mode: Voltage/Current (software selectable)
Input Range: ±150 mV, ±500 mV, ±5 V, ±10 V, 0 to 20 mA, 4 to 20 mA
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
±0.5% FSR @ -40 and 75°C
Sampling Rate:
All channels:
• 10 samples/sec for voltage
• 6 samples/sec for current
Per channel:
• 1.25 samples/sec for voltage
• 0.75 samples/sec for current
Single channel:
• 1.25 samples/sec for voltage
• 0.75 samples/sec for current
Input Impedance: 900 kilo-ohms ohms (min.)
Built-in Resistor for Current Input: 120 ohms

Analog Output
Resolution: 12 bits
Output Range: 0 to 10 V, 4 to 20 mA
Drive Voltage: 15 VDC for current output
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
±0.5% FSR @ -40 and 75°C
Load Resistor: Less than 250 ohms

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 190 mA @ 24 VDC

MTBF (mean time between failures)
Time: 155,941 hrs
Standard: Telcordia SR332

ioLogik E2242 Specifications

Inputs and Outputs
Configurable DIOs (by software): 12 channels
Analog Inputs: 4 channels
Isolation: 3k VDC or 2k Vrms

Digital Input
Sensor Type: Wet Contact (NPN or PNP) and Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: Open
Wet Contact (DI to GND):
• On: 0 to 3 VDC
• Off: 10 to 30 VDC
Common Type: 6 points per COM
Isolation: 3k VDC or 2k Vrms
Counter Frequency: 900 Hz
Digital Filtering Time Interval: Software selectable

Digital Output
Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 1 kHz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C (min.)
Current Rating: 200 mA per channel

Analog Input
Type: Differential input
Resolution: 16 bits
I/O Mode: Voltage / Current (software selectable)
Input Range: ±150 mV, 0 to 150 mV, ±500 mV, 0 to 500 mV, ±5 V, 0 to 5 V, ±10 V, 0 to 10 V, 0 to 20 mA, 4 to 20 mA

Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
±0.5% FSR @ -40 and 75°C
Sampling Rate:
All channels: 32 samples/sec
Per channel: 8 samples/sec
Single channel: 100 samples/sec
Input Impedance: 200 kilo-ohms ohms (min.)
Built-in Resistor for Current Input: 120 ohms

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 178 mA @ 24 VDC

MTBF (mean time between failures)
Time: 204,391 hrs
Database: Telcordia SR332

ioLogik E2260 Specifications

Inputs and Outputs
Digital Outputs: 4 channels
RTDs: 6 channels
Isolation: 3k VDC or 2k Vrms

Digital Output
Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 100 Hz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C
Current Rating: 200 mA per channel

RTD
Sensor Type: PT50, PT100, PT200, PT500, PT1000; JPT100, JPT200, JPT500, JPT1000; NI100, NI120, NI200, NI500, NI1000; Resistance of 310, 620, 1250, and 2200 ohms
Input Connection: 2- or 3-wire
Sampling Rate:
All channels: 12 samples/sec
Per channel: 2 samples/sec
Resolution: 0.1°C or 0.1 ohm
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
±0.5% FSR @ -40 and 75°C
Input Impedance: 625 kilo-ohms ohms

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 95 mA @ 24 VDC

MTBF (mean time between failures)
Time: 327,282 hrs
Standard: Telcordia SR332

ioLogik E2262 Specifications

Inputs and Outputs
Digital Outputs: 4 channels
Thermocouples: 8 channels

Digital Output
Isolation: 3k VDC or 2k Vrms
Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 100 Hz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C
Current Rating: 200 mA per channel

Thermocouple
Sensor Type: J (0 to 750°C), K (-200 to 1250°C), T (-200 to 350°C), E (-200 to 900°C), R (-50 to 1600°C), S (-50 to 1760°C), B (600 to 1700°C), N (-200 to 1300°C)
Millivolt Type:
• Mode: ±78.126 mV, ±39.062 mV, ±19.532 mV
• Fault and over-voltage protection: -35 to +35 VDC (power off); -25 to +30 VDC (power on)
Sampling Rate:
All channels: 12 samples/sec
Per channel: 1.5 samples/sec
Resolution: 16 bits
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
±0.5% FSR @ -40 and 75°C
Input Impedance: 1 mega-ohm ohms

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 160 mA @ 24 VDC

MTBF (mean time between failures)
Time: 341,063 hrs
Database: Telcordia SR332

Common Specifications

LAN
Ethernet: 1 10/100 Mbps RJ45 port
Protection: 1.5 kV magnetic isolation
Protocols: Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, SNMP, HTTP, CGI, SNTP, SMTP

Serial
Interface: 1 RS-485-2w terminal block port
Parity: None
Data Bits: 8
Stop Bits: 1
Flow Control: None
Baudrate: 1200 to 115200 bps
Protocols: Modbus RTU (gateway)

Physical Characteristics
Wiring: I/O cable max. 14 AWG
Dimensions: 115 x 79 x 45.6 mm (4.53 x 3.11 x 1.80 in)
Weight: under 250 g (0.55 lb)
Mounting: DIN-rail or wall

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
Altitude: Up to 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

Standards and Certifications

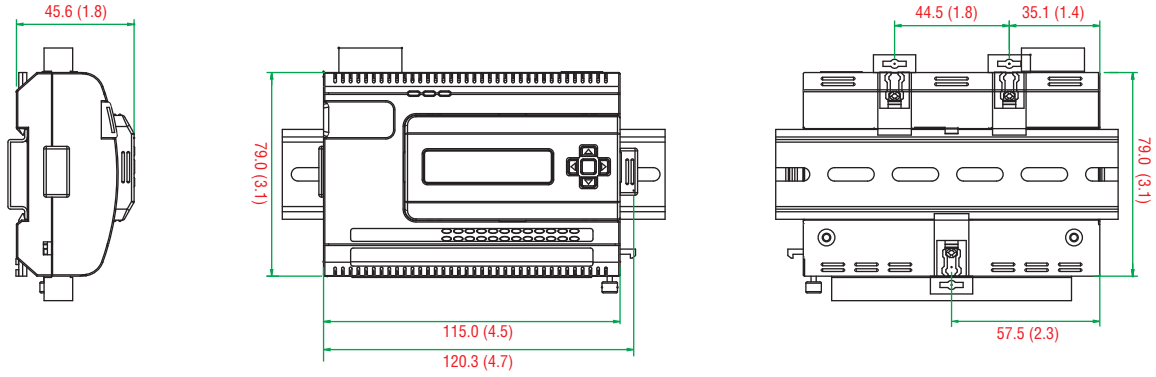
Safety: UL 508
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS:
80 MHz to 1 GHz: 10 V/m
1.4 GHz to 2 GHz: 3 V/m
2 GHz to 2.7 GHz: 1 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 1 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Green Product: RoHS, CRoHS, WEEE
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years (excluding ioLogik E2214*)
Details: See www.moxa.com/warranty
*Because of the limited lifetime of power relays, products that use that component are covered by a 2-year warranty.

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View

Ordering Information

Available Models

ioLogik E2210: Smart Ethernet Remote I/O with 12 DIs, 8 DOs, -10 to 60°C operating temperature
ioLogik E2210-T: Smart Ethernet Remote I/O with 12 DIs, 8 DOs, -40 to 75°C operating temperature
ioLogik E2212: Smart Ethernet Remote I/O with 8 DIs, 8 DOs, 4 DIOs, -10 to 60°C operating temperature
ioLogik E2212-T: Smart Ethernet Remote I/O with 8 DIs, 8 DOs, 4 DIOs, -40 to 75°C operating temperature
ioLogik E2214: Smart Ethernet Remote I/O with 6 DIs, 6 relays, -10 to 60°C operating temperature
ioLogik E2214-T: Smart Ethernet Remote I/O with 6 DIs, 6 relays, -40 to 75°C operating temperature
ioLogik E2240: Smart Ethernet Remote I/O with 8 AIs, 2 AOs, -10 to 60°C operating temperature
ioLogik E2240-T: Smart Ethernet Remote I/O with 8 AIs, 2 AOs, -40 to 75°C operating temperature
ioLogik E2242: Smart Ethernet Remote I/O with 12 DIOs, 4 AIs, -10 to 60°C operating temperature
ioLogik E2242-T: Smart Ethernet Remote I/O with 12 DIOs, 4 AIs, -40 to 75°C operating temperature
ioLogik E2260: Smart Ethernet Remote I/O with 4 DOs, 6 RTDs, -10 to 60°C operating temperature
ioLogik E2260-T: Smart Ethernet Remote I/O with 4 DOs, 6 RTDs, -40 to 75°C operating temperature
ioLogik E2262: Smart Ethernet Remote I/O with 4 DOs, 8 TCs, and -10 to 60°C operating temperature
ioLogik E2262-T: Smart Ethernet Remote I/O with 4 DOs, 8 TCs, and -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

LDP1602: LCD module with 16 x 2 text and 5 buttons, 0 to 55°C operating temperature

Package Checklist

- ioLogik E2200
- Documentation and software CD

Remote I/O

Product Selection Guide

Ethernet I/O 17-2
RS-485 I/O. 17-3
Modular I/O 17-4

Ethernet I/O

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ioLogik E1261W-T: Ethernet remote I/O for wind power applications 17-11
ioLogik E1200H Series: Ethernet remote I/O for offshore wind power applications 17-13
ioLogik E1500 Series: Ethernet remote I/O for railway applications 17-17

RS-485 I/O

ioLogik R1200 Series: RS-485 remote I/O. 17-20

Modular I/O

ioLogik 4000 Series: Modular remote I/O 17-23
ioLogik 4000 Expansion Modules 17-26

Ethernet I/O

	ioLogik E1210	ioLogik E1211	ioLogik E1212	ioLogik E1214	ioLogik E1213**	ioLogik E1240	ioLogik E1241	ioLogik E1242	ioLogik E1260	ioLogik E1262
Input/Output										
Digital Inputs	16	–	8	6	4	–	–	4	–	–
Digital Outputs	–	16	–	–	4	–	–	–	–	–
Relays	–	–	–	6	–	–	–	–	–	–
Configurable DIOs	–	–	8	–	4	–	–	4	–	–
Analog Inputs	–	–	–	–	–	8	–	4	–	–
Analog Outputs	–	–	–	–	–	–	4	–	–	–
RTDs	–	–	–	–	–	–	–	–	6	–
Thermocouples	–	–	–	–	–	–	–	–	–	8
Ethernet										
Ports (Connector)	2 (RJ45)									
Speed	10/100 Mbps									
Switch (Daisy Chain)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Protocols	Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, HTTP, SNMP									
Environmental Limits										
Standard Models	-10 to 60°C (14 to 140°F)									
Wide Temp. Models	-40 to 75°C (-40 to 167°F)									
Storage Temperature	-40 to 85°C (-40 to 185°F)									
Operating Humidity	5 to 95% RH (non-condensing)									
Software										
Active OPC Server	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MX-AOPC UA Server	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MXIO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ioSearch	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Peer-to-Peer	✓	✓	✓	✓	✓	✓	✓	✓	–	–
Standards and Certifications										
Safety	UL 508									
EMC	EN 55022, EN 55024									
EMI	CISPR 22, FCC Part 15B Class A									
EMS	EN 61000-4-2; EN 61000-4-3; EN 61000-4-4; EN 61000-4-5; EN 61000-4-6; EN 61000-4-8									
Shock	IEC 60068-2-27									
Vibration	IEC 60068-2-6									
Hazardous Locations	Class 1 Division 2; ATEX Zone 2									
Green Product	RoHS, CRoHS, WEEE									
Reliability										
Warranty	5 years	5 years	5 years	2 years*	5 years	5 years	5 years	5 years	5 years	5 years

*Because of the limited lifetime of power relays, products using that component are covered by a 2-year warranty.

**DO of ioLogik E1213 is source type

Ethernet I/O

	ioLogik E1261W-T	ioLogik E1263H-T	ioLogik E1261H-T	ioLogik E1510-M12-T	ioLogik E1512-M12-T
Input/Output					
Digital Inputs	–	–	–	12	4
Configurable DIOs	12	24	12	–	4
Analog Inputs	5	10	5	–	–
RTDs	3	3	3	–	–
Ethernet					
Ports (Connector)	1 (RJ45)	2 (RJ45)		1 (M12)	
Speed	10/100 Mbps				
Switch (Daisy Chain)	–	✓	✓	–	–
Protocols	Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, HTTP				
Environmental Limits					
Operating Temperature	-40 to 75°C (-40 to 167°F)			-40 to 85°C (-40 to 185°F)	
Storage Temperature	-40 to 85°C (-40 to 185°F)				
Operating Humidity	5 to 95% RH (non-condensing)				
Software					
Active OPC Server	✓	✓	✓	✓	✓
MX-AOPC UA Server	✓	✓	✓	✓	✓
MXIO	✓	✓	✓	✓	✓
ioSearch	✓	✓	✓	✓	✓
Standards and Certifications					
Safety	UL 508				
EMC	EN 55022, EN 55024			EN 61000-6-2, EN 61000-6-4	
EMI	CISPR 22, FCC Part 15B Class A				
EMS	EN 61000-4-2; EN 61000-4-3; EN 61000-4-4; EN 61000-4-5; EN 61000-4-6; EN 61000-4-8				
Shock	IEC 60068-2-27				
Vibration	IEC 60068-2-6				
Rail Traffic	–	–	–	EN 50155; EN 50121-3-2; EN 50121-4	
Marine Communications	–	IEC 60945		–	–
Green Product	RoHS, CRoHS, WEEE				
Reliability					
Warranty	5 years				

RS-485 I/O

	ioLogik R1210	ioLogik R1212	ioLogik R1214	ioLogik R1240	ioLogik R1241
Input/Output					
Digital Inputs	16	8	6	–	–
Relays	–	–	6	–	–
Configurable DIOs	–	8	–	–	–
Analog Inputs	–	–	–	8	–
Analog Outputs	–	–	–	–	4
Serial					
Ports (Connector)	2 (5-wire Euroblock terminal)				
Interface	Dual RS-485				
Protocols	Modbus/RTU (slave)				
Environmental Limits					
Standard Models	-10 to 75°C (14 to 167°F)				
Wide Temp. Models	-40 to 85°C (-40 to 185°F)				
Storage Temperature	-40 to 85°C (-40 to 185°F)				
Operating Humidity	5 to 95% RH (non-condensing)				
Software					
MXIO	✓	✓	✓	✓	✓
ioSearch	✓	✓	✓	✓	✓
Standards and Certifications					
Safety	UL 508				
EMC	EN 55022, EN 55024				
EMI	CISPR 22, FCC Part 15B Class A				
EMS	EN 61000-4-2; EN 61000-4-3; EN 61000-4-4; EN 61000-4-5; EN 61000-4-6; EN 61000-4-8				
Shock	IEC 60068-2-27				
Vibration	IEC 60068-2-6				
Green Product	RoHS, CRoHS, WEEE				
Reliability					
Warranty	5 years	5 years	2 years*	5 years	5 years

*Because of the limited lifetime of power relays, products using that component are covered by a 2-year warranty.

Modular I/O

	NA-4010	NA-4020	NA-4021	ioLogik E4200
Inputs/Outputs				
Digital Inputs	–	–	–	–
Digital Outputs	–	–	–	–
Analog Inputs	–	–	–	–
Analog Outputs	–	–	–	–
Ethernet				
Ports (connector)	1 (RJ45)	–	–	2 MACs (RJ45)
Speed	10/100 Mbps	–	–	10/100 Mbps
Protocols	Modbus/TCP (slave), BOOTP, HTTP	–	–	Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, SNMP, HTTP, SNTP
Serial				
Ports (connector)	–	1 (terminal block)	1 (DB9 female)	1 (DB9 male)
Interface	–	RS-485	RS-232	RS-232
Protocols	–	Modbus/RTU (slave), Modbus/ASCII (slave)		For Moxa OnCell only
Physical Characteristics				
I/O Module Slots	32	32	32	16
Environmental Limits				
Operating Temperature	-10 to 60°C (14 to 140°F)			
Storage Temperature	-40 to 85°C (-40 to 185°F)			
Ambient Relative Humidity	5 to 95% RH (non-condensing)			
Software				
Click&Go	–	–	–	✓
Active OPC Server	–	–	–	✓
MXIO	✓	✓	✓	✓
ioAdmin	✓	✓	✓	–
Modular ioAdmin	–	–	–	✓
Standards and Certifications				
Safety	UL 508			
EMC	EN 61000-6-2, EN 61000-6-4			
EMI	CISPR 22, FCC Part 15B Class A			
EMS	EN 61000-4-2; EN 61000-4-3; EN 61000-4-4; EN 61000-4-5; EN 61000-4-6; EN 61000-4-8			
Shock	IEC 60068-2-27			
Vibration	IEC 60068-2-6			
Reliability				
Warranty	2 years	2 years	2 years	2 years

Digital I/O Modules

	M-1450	M-1451	M-1600	M-1601	M-1800	M-1801	M-2450	M-2600	M-2601	M-2800	M-2801
Inputs/Outputs											
Digital Inputs	4 (110 VAC)	4 (220 VAC)	16 (Sink)	16 (Source)	8 (Sink)	8 (Source)	–	–	–	–	–
Digital Outputs	–	–	–	–	–	–	–	16 (Sink)	16 (Source)	8 (Sink)	8 (Source)
Relays	–	–	–	–	–	–	4	–	–	–	–
Warranty	2 years										

Analog I/O Modules

	M-3802	M-3810	M-4402	M-4410	M-6200	M-6201
Inputs/Outputs						
Analog Inputs	8 (4 to 20 mA)	8 (00 to 10 V)	–	–	–	–
Analog Outputs	–	–	4 (4 to 20 mA)	4 (0 to 10 V)	–	–
RTDs	–	–	–	–	2	–
Thermocouples	–	–	–	–	–	2
Warranty	2 years					

Power Modules

	M-7001	M-7002	M-7804	M-7805
Power				
VDC	24	5/24/48	0	24
VAC	–	110/220	–	–
Purpose	System	Field	Field	Field
Warranty	2 years			

ioLogik E1200 Series

Ethernet remote I/O with 2-port Ethernet switch

- User-definable Modbus/TCP Slave addressing
- 2-port Ethernet switch for daisy-chain topologies
- Save time and wiring cost with peer-to-peer communications
- Active communications with MX-AOPC UA Server
- Supports SNMPv1/v2c
- Easy mass deployment and configuration with ioSearch utility
- Friendly configuration via web browser
- Simplify I/O management with MXIO library on either a Windows or Linux platform
- Class I Division 2, ATEX Zone 2 certification
- Wide operating temperature range: -40 to 75°C (-40 to 167°F)

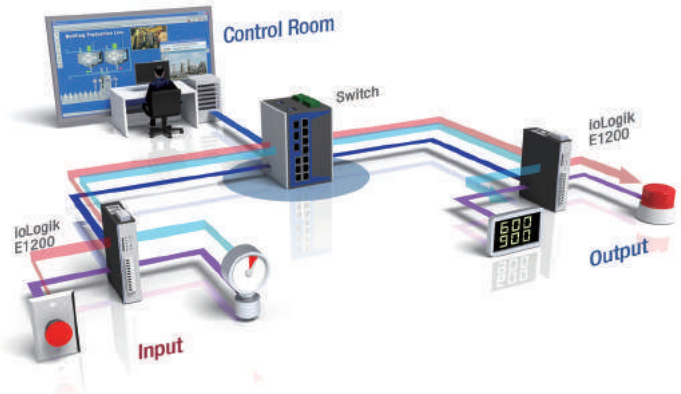
Introduction

Daisy-Chained Ethernet I/O Connection

A new era of extensible Ethernet I/O arrays is here. The ioLogik E1200 industrial Ethernet remote I/O comes with two switched Ethernet ports to allow for the free flow of information downstream, to another local Ethernet device, or upstream, to a control server. Applications such as factory automation, security and surveillance systems, and tunnelled connections can make use of daisy-chained Ethernet for building multidrop I/O networks over standard Ethernet cables. Many industrial automation users are familiar with multidrop as the configuration most typically used in fieldbus solutions. The daisy-chain capabilities supported by ioLogik E1200 Ethernet remote I/O units not only increase the extensibility and installation possibilities for your remote I/O applications, but also lower overall costs by reducing the need for separate Ethernet switches. Daisy-chaining devices in this way will also reduce overall labor and cabling expenses. For example, if a production facility contains 700 stations with 20 I/O points per station, the savings on wiring costs can reach as much as 15% of the total expense.

Saving Time and Wiring Costs with Peer-to-Peer Communications

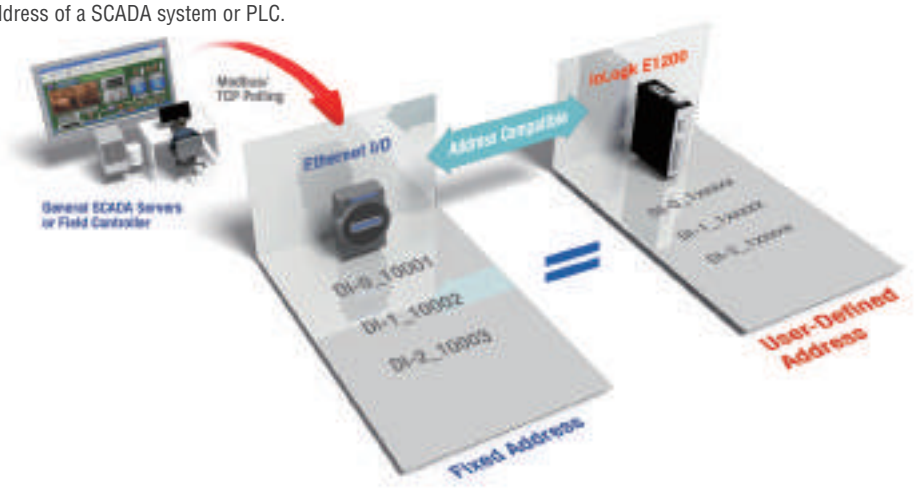
In remote automation applications, the control room and sensors are often far removed, making wiring over long distances a constant challenge. With peer-to-peer networking, users may now map a pair of ioLogik E1200 series modules so that input values will be directly transferred to output channels, greatly simplifying the wiring process and reducing wiring costs.



User-Definable Modbus/TCP Addressing for Painless Upgrading of Existing Systems

For Modbus devices that are controlled and detected by fixed addresses, users need to spend a vast amount of time researching and verifying initial configurations. Users need to locate each device's networking details, such as I/O channels or vendor-defined addresses, to enable the initial or start address of a SCADA system or PLC.

The ioLogik E1200, with user-definable Modbus/TCP addressing, offers greater flexibility, and setup is easy. Instead of worrying about individual devices, users simply configure the function and address map to fit their needs.



ioLogik E1210 Specifications

Inputs and Outputs
Digital Inputs: 16 channels
Isolation: 3k VDC or 2k Vrms

Digital Input
Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to COM):
• On: 10 to 30 VDC
• Off: 0 to 3 VDC
Common Type: 8 points per COM
Counter Frequency: 250 Hz
Digital Filtering Time Interval: Software configurable

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 110 mA @ 24 VDC

MTBF (mean time between failures)
Time: 671,345 hrs
Standard: Telcordia SR332

ioLogik E1211 Specifications

Inputs and Outputs
Digital Outputs: 16 channels
Isolation: 3k VDC or 2k Vrms

Digital Output
Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 500 Hz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C (typical), 150°C (min.)
Current Rating: 200 mA per channel

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 200 mA @ 24 VDC

MTBF (mean time between failures)
Time: 923,027 hrs
Standard: Telcordia SR332

ioLogik E1212 Specifications

Inputs and Outputs
Digital Inputs: 8 channels
Configurable DIOs (by jumper): 8 channels
Isolation: 3k VDC or 2k Vrms

Digital Input
Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to COM):
• On: 10 to 30 VDC
• Off: 0 to 3 VDC
Common Type: 8 points per COM
Counter Frequency: 250 Hz
Digital Filtering Time Interval: Software Configurable

Digital Output
Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 500 Hz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C (typical), 150°C (min.)
Current Rating: 200 mA per channel

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 155 mA @ 24 VDC

MTBF (mean time between failures)
Time: 561,930 hrs
Standard: Telcordia SR332

ioLogik E1213 Specifications

Inputs and Outputs
Digital Inputs: 8 channels
Digital Outputs: 4 channels
Configurable DIOs (by jumper): 4 channels
Isolation: 3k VDC or 2k Vrms

Digital Input
Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to COM):
• On: 10 to 30 VDC
• Off: 0 to 3 VDC
Common Type: 12 points per COM
Counter Frequency: 250 Hz
Digital Filtering Time Interval: Software configurable

Digital Output
Type: Source
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 500 Hz
Over-Voltage Protection: 41 VDC
Over-current Protection: 1.5 A per channel @ 25°C
Over-Temperature Shutdown: 175°C (typical), 150°C (min.)
Current Rating: 500 mA per channel

Power Requirements
Output Voltage Rating: 15 to 30 VDC (12 or 9 VDC configurable by jumper on the 4 DO channels)
Input Voltage: 12 to 36 VDC
Input Current: 130 mA @ 24 VDC

MTBF (mean time between failures)
Time: 715,256 hrs
Standard: Telcordia SR332

ioLogik E1214 Specifications

Inputs and Outputs
Digital Inputs: 6 channels
Relays: 6 channels
Isolation: 3k VDC or 2k Vrms

Digital Input
Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to COM):
• On: 10 to 30 VDC
• Off: 0 to 3 VDC
Common Type: 6 points per COM
Counter Frequency: 250 Hz
Digital Filtering Time Interval: Software configurable

Relay
Type: Form A (N.O.) power relay
Contact Current Rating:
Resistive Load: 5 A @ 30 VDC, 250 VAC, 110 VAC
Breakdown Voltage: 500 VAC
Relay On/Off Time: 1500 ms (max.)
Initial Insulation Resistance: 1000 mega-ohms (min.) @ 500 VDC
Mechanical Endurance: 5,000,000 operations
Electrical Endurance: 100,000 operations @ 5 A resistive load
Contact Resistance: 100 milli-ohms (max.)
Pulse Output: 0.3 Hz at rated load
Note: Ambient humidity must be non-condensing and remain between 5 and 95%. The relays of the ioLogik E1214 may malfunction when operating in high condensation environments below 0°C.

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 188 mA @ 24 VDC

MTBF (mean time between failures)
Time: 808,744 hrs
Standard: Telcordia SR332

ioLogik E1240 Specifications

Inputs and Outputs
Analog Inputs: 8 channels
Isolation: 3k VDC or 2k Vrms

Analog Input
Type: Differential input
Resolution: 16 bits
I/O Mode: Voltage / Current (jumper selectable)
Input Range: 0 to 10 VDC, 0 to 20 mA, 4 to 20 mA, 4 to 20 mA (burnout detection)
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
±0.5% FSR @ -40 and 75°C
Sampling Rate:
• All channels: 12 samples/sec
• Per channel: 1.5 samples/sec
• Only one channel enabled: 12 samples/sec
Input Impedance: 10 mega-ohms (min.)
Built-in Resistor for Current Input: 120 ohms

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 121 mA @ 24 VDC

MTBF (mean time between failures)
Time: 474,053 hrs
Standard: Telcordia SR332

ioLogik E1241 Specifications

Inputs and Outputs
Analog Outputs: 4 channels
Isolation: 3k VDC or 2k Vrms

Analog Output
Resolution: 12 bits
Output Range: 0 to 10 VDC, 4 to 20 mA
Drive Voltage: 10 mA (max.)
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -40 and 75°C
Load Resistor: Internal register, 400 ohms
Note: 24 V of external power required when loading exceeds 1000 ohms.

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 194 mA @ 24 VDC

MTBF (mean time between failures)
Time: 888,656 hrs
Standard: Telcordia SR332

ioLogik E1242 Specifications

Inputs and Outputs
Digital Inputs: 4 channels
Configurable DIOs (by jumper): 4 channels
Analog Inputs: 4 channels
Isolation: 3k VDC or 2k Vrms

Digital Input
Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to COM):
• On: 10 to 30 VDC
• Off: 0 to 3 VDC
Common Type: 4 points per COM
Counter Frequency: 250 Hz
Digital Filtering Time Interval: Software Configurable

Digital Output
Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 500 Hz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C (typical), 150°C (min.)
Current Rating: 200 mA per channel

Analog Input
Type: Differential input
Resolution: 16 bits
I/O Mode: Voltage / Current (jumper selectable)
Input Range: 0 to 10 VDC, 0 to 20 mA, 4 to 20 mA, 4 to 20 mA (burnout detection)
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
±0.5% FSR @ -40 and 75°C
Sampling Rate:
• All channels: 12 samples/sec
• Per channel: 3 samples/sec
• Only one channel enabled: 12 samples/sec
Input Impedance: 10 mega-ohms (min.)
Built-in Resistor for Current Input: 120 ohms

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 139 mA @ 24 VDC

MTBF (mean time between failures)
Time: 502,210 hrs
Standard: Telcordia SR332

ioLogik E1260 Specifications

Inputs and Outputs
RTDs: 6 channels
Isolation: 3k VDC or 2k Vrms

RTD
Sensor Type:
• PT50, PT100, PT200, PT500 (-200 to 850°C)
• PT1000 (-200 to 350°C)
• Resistance of 310, 620, 1250, and 2200 ohms
Input Connection: 2- or 3-wire
Sampling Rate:
• All channels: 12 samples/sec
• Per channel: 2 samples/sec
• Only one channel enabled: 12 samples/sec
Resolution: 0.1°C or 0.1 ohm
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -40 and 75°C
Input Impedance: 625 kilo-ohms

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 110 mA @ 24 VDC

MTBF (mean time between failures)
Time: 660,260 hrs
Standard: Telcordia SR332

ioLogik E1262 Specifications

Inputs and Outputs
Thermocouples: 8 channels
Isolation: 3k VDC or 2k Vrms

Thermocouple
Sensor Type: J (0 to 750°C), K (-200 to 1250°C), T (-200 to 350°C), E (-200 to 900°C), R (-50 to 1600°C), S (-50 to 1760°C), B (600 to 1700°C), N (-200 to 1300°C)
Millivolt Type:
• Mode: ±78.126 mV, ±39.062 mV, ±19.532 mV
• Fault and over-voltage protection:
-35 to +35 VDC (power off)
-25 to +30 VDC (power on)
Sampling Rate:
• All channels: 12 samples/sec
• Per channel: 1.5 samples/sec
• Only one channel enabled: 12 samples/sec
Resolution: 16 bits
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -40 and 75°C
Input Impedance: 10 mega-ohms

Power Requirements
Input Voltage: 12 to 36 VDC
Input Current: 118 mA @ 24 VDC

MTBF (mean time between failures)
Time: 631,418 hrs
Standard: Telcordia SR332

Common Specifications

LAN

Ethernet: 2 switched 10/100 Mbps RJ45 ports
Protection: 1.5 kV magnetic isolation
Protocols: Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, HTTP

Physical Characteristics

Wiring: I/O cable max. 14 AWG
Dimensions: 27.8 x 124 x 84 mm (1.09 x 4.88 x 3.31 in)
Weight: Under 200 g (0.44 lb)
Mounting: DIN rail or wall

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
Altitude: Up to 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

Standards and Certifications

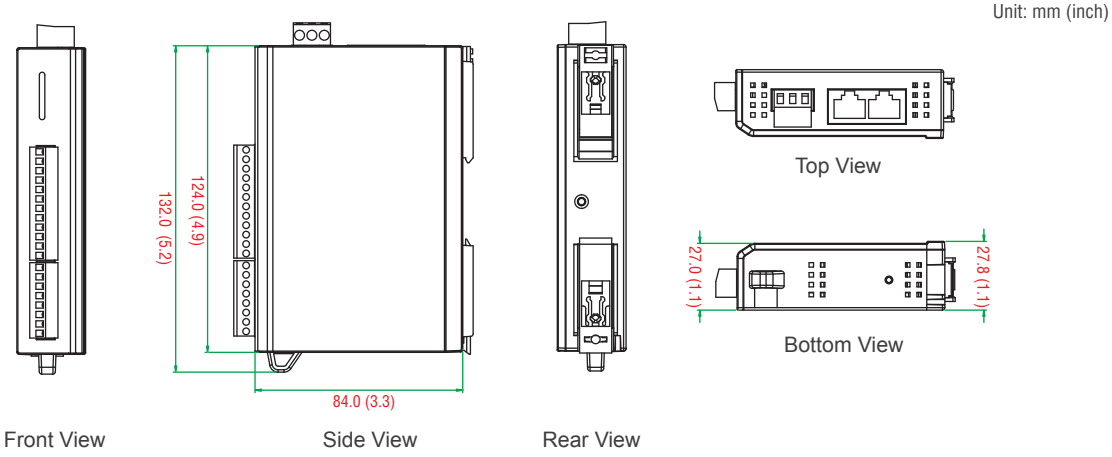
Safety: UL 508
EMC: EN 55022, EN 55024
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Hazardous Location: Class 1 Division 2, ATEX Zone 2
Green Product: RoHS, CRoHS, WEEE
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years (excluding the ioLogik E1214)
Details: See www.moxa.com/warranty
Note: Because of the limited lifetime of power relays, products that use this component are covered by a 2-year warranty.

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

ioLogik E1210: Ethernet remote I/O with 2-port Ethernet switch, 16 DIs, -10 to 60°C operating temperature
ioLogik E1210-T: Ethernet remote I/O with 2-port Ethernet switch, 16 DIs, -40 to 75°C operating temperature
ioLogik E1211: Ethernet remote I/O with 2-port Ethernet switch, 16 DOs, -10 to 60°C operating temperature
ioLogik E1211-T: Ethernet remote I/O with 2-port Ethernet switch, 16 DOs, -40 to 75°C operating temperature
ioLogik E1212: Ethernet remote I/O with 2-port Ethernet switch, 8 DIs, 8 DIOs, -10 to 60°C operating temperature
ioLogik E1212-T: Ethernet remote I/O with 2-port Ethernet switch, 8 DIs, 8 DIOs, -40 to 75°C operating temperature
ioLogik E1213: Ethernet remote I/O with 2-port Ethernet switch, 8 DIs, 4 DOs, 4 DIOs, source-type DO, -10 to 60°C operating temperature
ioLogik E1213-T: Ethernet remote I/O with 2-port ethernet switch, 8 DIs, 4 DOs, 4 DIOs, source-type DO, -40 to 75°C operating temperature
ioLogik E1214: Ethernet remote I/O with 2-port Ethernet switch, 6 DIs, 6 relays, -10 to 60°C operating temperature
ioLogik E1214-T: Ethernet remote I/O with 2-port Ethernet switch, 6 DIs, 6 relays, -40 to 75°C operating temperature
ioLogik E1240: Ethernet remote I/O with 2-port Ethernet switch, 8 AIs, -10 to 60°C operating temperature
ioLogik E1240-T: Ethernet remote I/O with 2-port Ethernet switch, 8 AIs, -40 to 75°C operating temperature
ioLogik E1241: Ethernet remote I/O with 2-port Ethernet switch, 4 AOs, -10 to 60°C operating temperature
ioLogik E1241-T: Ethernet remote I/O with 2-port Ethernet switch, 4 AOs , -40 to 75°C operating temperature
ioLogik E1242: Ethernet remote I/O with 2-port Ethernet switch, 4 DIs, 4 DIOs, 4 AIs, -10 to 60°C operating temperature
ioLogik E1242-T: Ethernet remote I/O with 2-port Ethernet switch, 4 DIs, 4 DIOs, 4 AIs, -40 to 75°C operating temperature
ioLogik E1260: Ethernet remote I/O with 2-port Ethernet switch, 6 RTDs, -10 to 60°C operating temperature
ioLogik E1260-T: Ethernet remote I/O with 2-port Ethernet switch, 6 RTDs, -40 to 75°C operating temperature
ioLogik E1262: Ethernet remote I/O with 2-port Ethernet switch, 8 TCs, -10 to 60°C operating temperature
ioLogik E1262-T: Ethernet remote I/O with 2-port Ethernet switch, 8 TCs, -40 to 75°C operating temperature

Package Checklist

- ioLogik E1200
- Documentation and software CD
- Quick installation guide (printed)

ioLogik E1261W-T

Ethernet remote I/O for wind power applications

- User-definable Modbus/TCP Slave addressing
- Active communications with MX-AOPC UA Server
- Easy mass deployment and configuration with ioSearch utility
- Friendly configuration via web browser
- Simplify I/O management with MXIO library on either Windows or Linux platform
- Wide operating temperature range: -40 to 75°C (-40 to 167°F)

Introduction

Moxa's ioLogik E1261W-T is designed for Ethernet-based remote condition monitoring systems. With 3 RTD, 5 AI, and 12 DIO channels, the ioLogik E1261W-T's I/O combination is ideal for monitoring wind turbines and environmental conditions. Unlike other remote I/O products, which are passive and must poll for data, the ioLogik E1261W-T supports active communication with Moxa's MX-AOPC UA Server to enable real time communications capabilities with remote monitoring and control systems.

Specifications

LAN

Ethernet: 1 10/100 Mbps RJ45 port
Protection: 1.5 kV magnetic isolation
Protocols: Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, HTTP

Serial

Interface: 1 RS-485-2w terminal block port
Parity: None
Data Bits: 8
Stop Bits: 1
Flow Control: None
Baudrate: 1200 to 115200 bps
Protocols: Modbus RTU (slave)

Inputs and Outputs

Configurable DIOs (by software): 12 channels
Analog Inputs: 5 channels
RTDs: 3 channels
Isolation: 3k VDC or 2k Vrms

Digital Input

Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to GND):
• On: 0 to 3 VDC
• Off: 10 to 30 VDC
Common Type: 12 points per COM
Counter Frequency: 250 Hz
Digital Filtering Time Interval: Software Configurable

Digital Output

Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 500 Hz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C (typical), 150°C (min.)
Current Rating: 200 mA per channe

Analog Input

Type: Differential input
Resolution: 16 bits
I/O Mode: Voltage / Current (software selectable)
Input Range: 0 to 10 VDC, 0 to 20 mA, 4 to 20 mA, 4 to 20 mA (burnout detection)
Accuracy:
• ±0.1% FSR @ 25°C
• ±1.0% FSR @ -40 and 75°C
Sampling Rate:
• All channels: 12 samples/sec
• Per channel: 2.4 samples/sec
Input Impedance: 10 mega-ohms (min.)
Built-in Resistor for Current Input: 120 ohms

RTD

Sensor Type: PT100 (-200 to 850°C)
Input connection: 2- or 3-wire
Sampling Rate:
• All channels: 12 samples/sec
• Per channel: 4 samples/sec
Resolution: 16 bits
Accuracy:
• ±0.1% FSR @ 25°C
• ±1.0% FSR @ -40 and 75°C
Input Impedance: 625 kilo-ohms (min.)

Power Requirements

Input Voltage: 12 to 36 VDC
Input Current: 143 mA @ 24 VDC

Physical Characteristics

Wiring: I/O cable, 14 AWG (max.)
Dimensions: 115 x 79 x 40.4 mm (4.53 x 3.11 x 1.59 in)
Weight: Under 250 g (0.55 lb)
Mounting: DIN-rail or wall

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
Altitude: Up to 2000 m
Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Green Product: RoHS, CRoHS, WEEE
Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

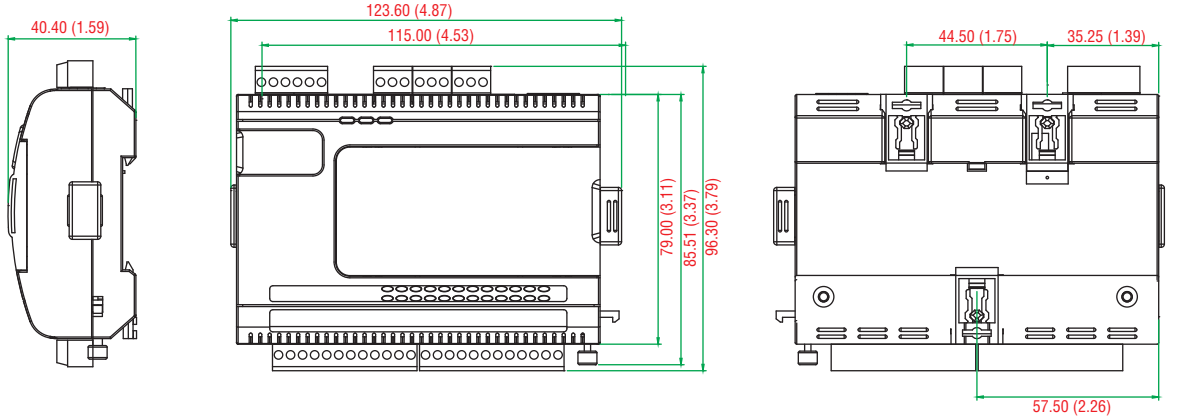
Time: 367,508 hrs
Standard: Telcordia SR332

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View

Ordering Information

Available Models

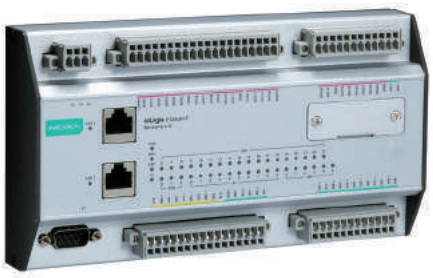
ioLogik E1261W-T: Ethernet remote I/O with 12 DIOs, 5 AIs, 3 RTDs, -40 to 75°C operating temperature

Package Checklist

- ioLogik E1261W-T
- Documentation and software CD
- Quick installation guide (printed)

ioLogik E1200H Series

Ethernet remote I/O for offshore wind power applications



- User-definable Modbus/TCP Slave addressing
- 2-port Ethernet switch for daisy-chain topologies
- Active communications with MX-AOPC UA Server
- Easy mass deployment and configuration with ioSearch utility
- Friendly configuration via web browser
- Simplify I/O management with MXIO library on either Windows or Linux platform
- IEC 60945 approval for harsh offshore environments
- Wide operating temperature range: -40 to 75°C (-40 to 167°F)

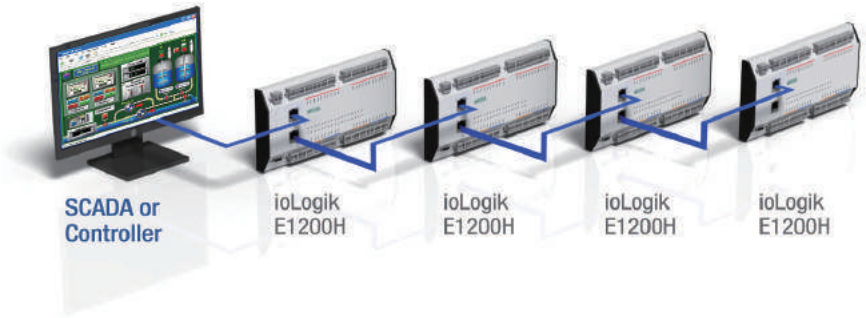
Introduction

Industry-Proven Rugged Design

Installation of remote Ethernet I/O in offshore environments is a real challenge. It is critical to find devices properly designed for protected, safe use in these environments. Moxa's ioLogik E1200H series with IEC 60945 certifications fulfills the need for devices suitable for such demanding industrial applications. Compactly packaged in a metal housing, this rugged hardware supports operating temperatures ranging from -40 to 75°C, meeting the stringent demands of IEC 60945 for harsh offshore applications.

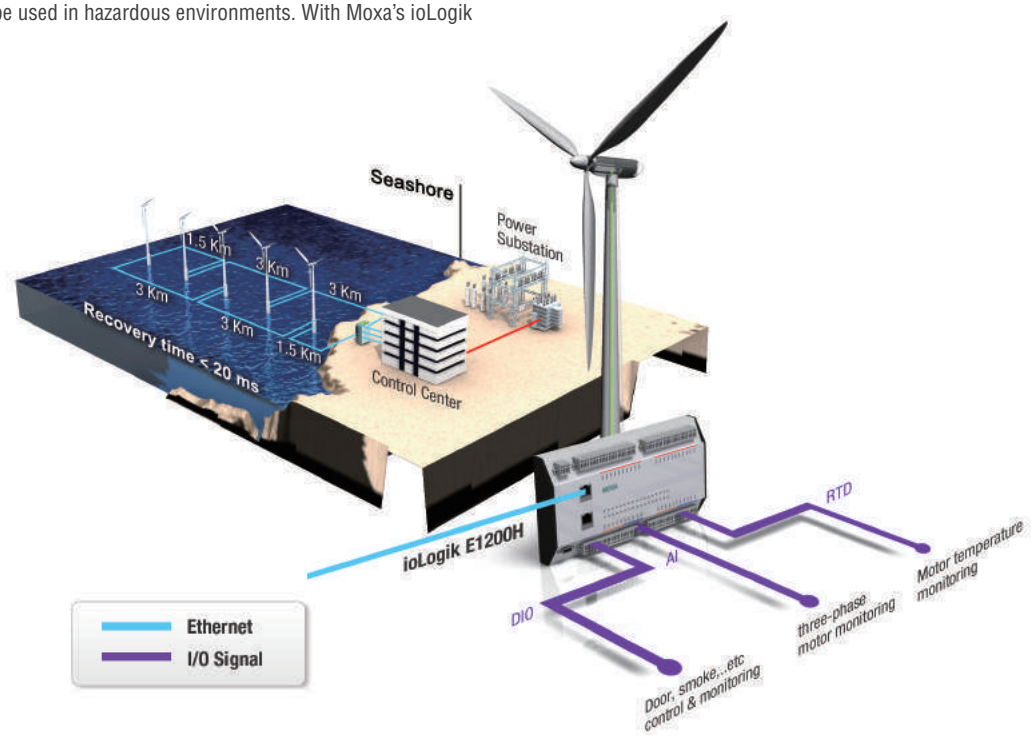
Daisy-Chain Topology Reduces Deployment Costs

Thanks to its two embedded Ethernet switch ports, the ioLogik E1200H remote Ethernet I/O allows you to create daisy-chain topologies for easy cabling. In distributed Ethernet data acquisition applications, panels, units, and cabinets are often located at remote sites where space is limited. The daisy-chain capability of the ioLogik E1200H series allows ioLogik E1200H units to connect in series either to each other or to other nearby Ethernet devices, drastically saving on both space and wiring costs.



Application: Offshore Remote Monitoring

Have you ever wondered where to find a rugged remote Ethernet I/O device for offshore facilities? You need something with the ability to withstand extreme weather conditions, wide temperature changes, and that can be used in hazardous environments. With Moxa's ioLogik E1200H, you get a robust design that will meet your most stringent demands, ensuring your remote data acquisition applications are reliable, consistent, and safe.



ioLogik E1261H Specifications

Inputs and Outputs

Configurable DIOs (by software): 12 channels
Analog Inputs: 5 channels
RTDs: 3 channels
Isolation: 3k VDC or 2k Vrms

Digital Input

Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter (channels 0 to 3)
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to GND):
• On: 0 to 3 VDC
• Off: 10 to 30 VDC
Common Type: 12 points per COM
Counter Frequency: 250 Hz
Digital Filtering Time Interval: Software Configurable

Digital Output

Type: Sink
I/O Mode: DO or Pulse Output (channels 0 to 3)
Pulse Output Frequency: 500 Hz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C (typical), 150°C (min.)
Current Rating: 200 mA per channel

Analog Input

Type: Differential input
Resolution: 16 bits
I/O Mode: Voltage / Current (software selectable)
Input Range: 0 to 10 V, 0 to 20 mA, 4 to 20 mA, 4 to 20 mA (burnout detection)
Accuracy:
• ±0.5% FSR @ 25°C
• ±1.0% FSR @ -40 and 75°
Sampling Rate (all channels):
• All channels: 12 samples/sec
• Per channel: 1.5 samples/sec
Input Impedance: 10 mega-ohms (min.)
Built-in Resistor for Current Input: 120 ohms

RTDs

Sensor Type:
PT100 (-200 to 850°C)
Input Connection: 2- or 3-wire
Sampling Rate:
• All channels: 12 samples/sec
• Per channel: 1.5 samples/sec
Resolution: 0.5°C
Accuracy:
• ±0.5% FSR @ 25°C
• ±1.0% FSR @ -40 and 75°C
Input Impedance: 625 kilo-ohms

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current: 235 mA @ 24 VDC

Physical Characteristics

Dimensions: 140 x 113 x 36.3 mm (5.51 x 4.45 x 1.43 in)
Weight: 825 g (1.82 lb)

MTBF (mean time between failures)

Time: 296,094 hrs
Standard: Telcordia SR332

ioLogik E1263H Specifications

Inputs and Outputs
Configurable DIOs (by software): 24 channels
Analog Inputs: 10 channels
RTDs: 3 channels
Isolation: 3k VDC or 2k Vrms

Digital Input
Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter (channels 0 to 7)
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to GND):
• On: 0 to 3 VDC
• Off: 10 to 30 VDC
Common Type: 12 points per COM
Counter Frequency: 250 Hz
Digital Filtering Time Interval: Software configurable

Digital Output
Type: Sink
I/O Mode: DO or Pulse Output (channels 0 to 7)
Pulse Output Frequency: 500 Hz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C (typical), 150°C (min.)
Current Rating: 200 mA per channel

Analog Input
Type: Differential input
Resolution: 16 bits
I/O Mode: Voltage / Current (software selectable)
Input Range: 0 to 10 V, 0 to 20 mA, 4 to 20 mA, 4 to 20 mA (burnout detection)
Accuracy:
• ±0.5% FSR @ 25°C
• ±1.0% FSR @ -40 and 75°
Sampling Rate (all channels):
• All channels: 12 samples/sec
• Per channel: 0.9 samples/sec
Input Impedance: 10 mega-ohms (min.)
Built-in Resistor for Current Input: 120 ohms

RTDs
Sensor Type:
• PT100 (-200 to 850°C)
Input connection: 2- or 3-wire
Sampling Rate:
• All channels: 12 samples/sec
• Per channel: 0.9 samples/sec
Resolution: 0.5°C
Accuracy:
• ±0.5% FSR @ 25°C
• ±1.0% FSR @ -40 and 75°C
Input Impedance: 625 kilo-ohms

Power Requirements
Input Voltage: 12 to 48 VDC
Input Current: 343 mA @ 24 VDC

Physical Characteristics
Dimensions: 204 x 113 x 36.3 mm (8.03 x 4.45 x 1.43 in)
Weight: 945 g (2.08 lb)

MTBF (mean time between failures)
Time: 180,390 hrs
Standard: Telcordia SR332

Common Specifications

LAN
Ethernet: 2 switched 10/100 Mbps RJ45 ports
Protection: 1.5 kV magnetic isolation
Protocols: Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, HTTP

Serial
Interface: 1 RS-232/422/485 (software selectable) DB9 male port
Parity: None
Data Bits: 8
Stop Bits: 1
Flow Control: None
Baudrate: 300 to 115200 bps
Protocols: Modbus RTU (slave)

Physical Characteristics
Wiring: I/O cable max. 14 AWG
Mounting: DIN rail (standard), wall (with optional kit)

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
Altitude: Up to 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

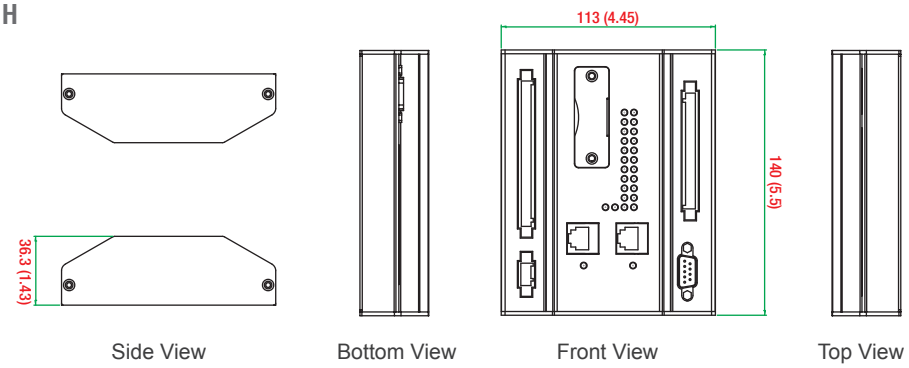
Standards and Certifications
Safety: UL 508
EMC: EN 55022/24, EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 3 V
IEC 61000-4-8
Maritime: IEC 60945
Green Product: RoHS, CRoHS, WEEE
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

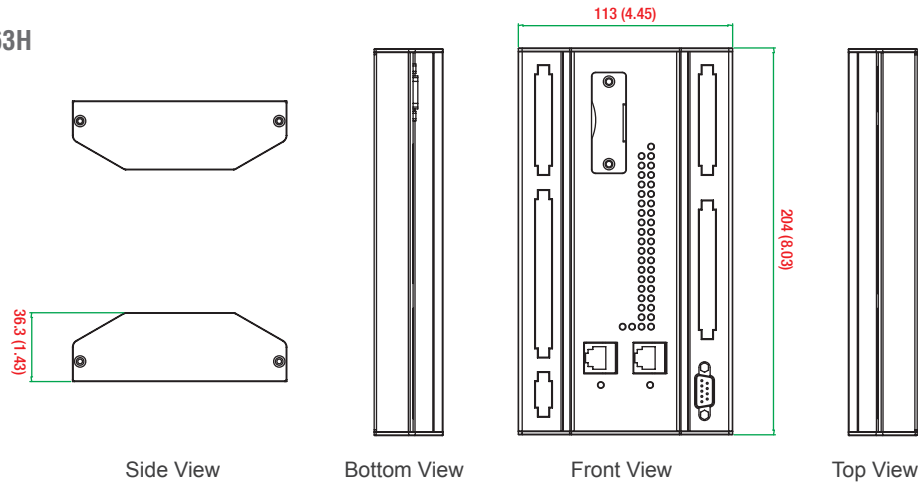
Dimensions

Unit: mm (inch)

ioLogik E1261H



ioLogik E1263H



Ordering Information

Available Models

ioLogik E1261H-T: Ethernet remote I/O with 2-port Ethernet switch, 12 DIOs, 5 AIs and 3 RTDs, -40 to 75°C operating temperature.

ioLogik E1263H-T: Ethernet remote I/O with 2-port Ethernet switch, 24 DIOs, 10 AIs and 3 RTDs, -40 to 75°C operating temperature.

Optional Accessories (can be purchased separately)

WK-90: Wall-mounting kit, BKTx2 FMSx6 NI Nylok M3x6

Package Checklist

- ioLogik E1200H-T
- Documentation and software CD
- Quick installation guide (printed)

ioLogik E1500 Series

Ethernet remote I/O for railway applications

- User-definable Modbus/TCP Slave addressing
- Active communications with MX-AOPC UA Server
- Easy mass deployment and configuration with ioSearch utility
- Friendly configuration via web browser
- Simplify I/O management with MXIO library on either Windows or Linux platform
- EN 50121-3-2, EN 50121-4, and EN 50155* approval for harsh railway environments
- Wide operating temperature range: -40 to 85°C (-40 to 185°F)

*Complies with a portion of EN 50155 specifications

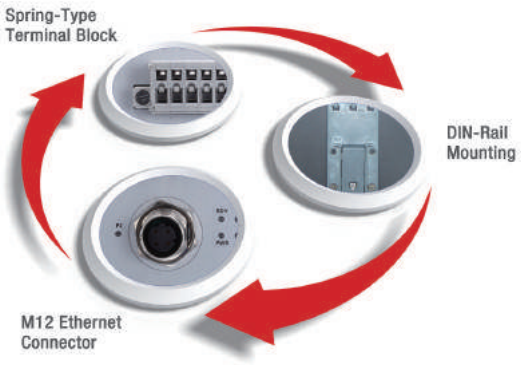
EN 50121 RoHS c UL us LISTED CE FC

Introduction

The ioLogik E1500 series is designed to withstand the severe vibrations experienced in rolling stock and wayside applications. These products come with a threaded M12 Ethernet port to ensure wired connectivity, a spring-type terminal block for vibration-resistant cabling, and a convenient DIN-rail mounting assembly. Carefully engineered DI channel-to-channel isolation helps maintain stable data communications by providing protection against cross-line power surges and crosstalk. In addition, this remote I/O product is compliant with EN 50121-3-2, EN 50121-4, and a portion of EN 50155 specifications, covering operating temperature, power input voltage, surge, ESD, and vibration, making the products suitable for a variety of industrial applications, including electronic equipment used on or around railway vehicles.

Ruggedly Designed for Monitoring Rolling Stock

The ioLogik E1500 Ethernet remote I/O devices have a durable aluminum housing and are compliant with EN 50121-3-2, EN 50121-4, and essential sections of EN 50155, all of which are essential for electronic equipment used in railway applications. The ioLogik E1500 design strictly conforms to EN standards, including not only EMC requirements but also with regards to shock, vibration, extended temperature range, humidity, and power supply variations.

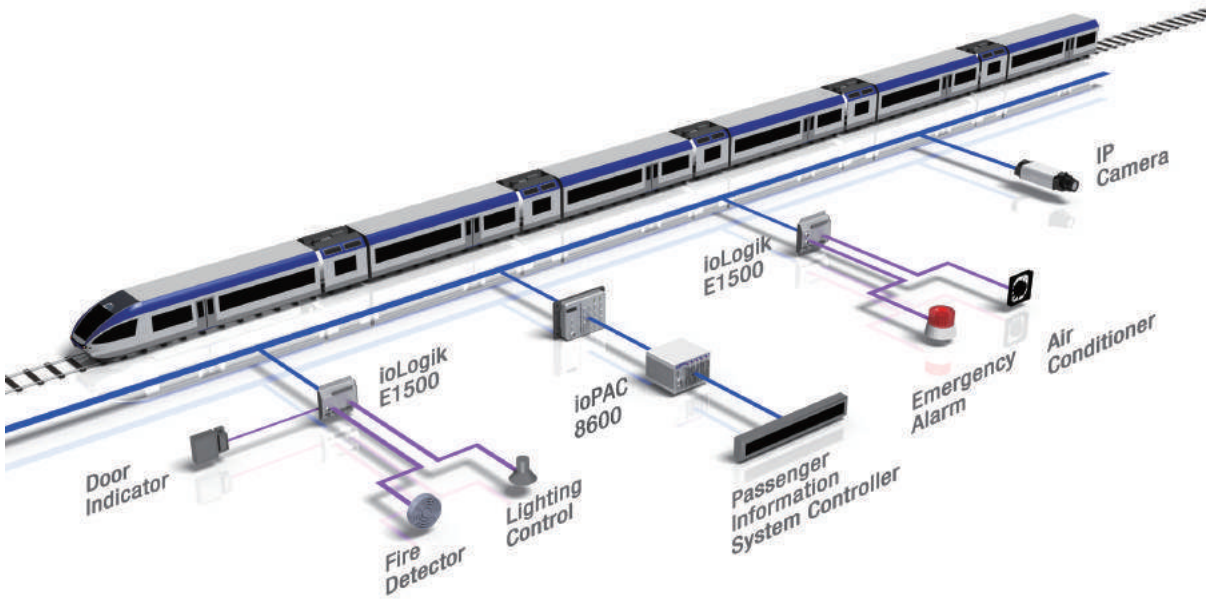


Channel-to-Channel Isolation

With this topology, I/O channels on the ioLogik E1500 are individually isolated from one another to ensure that data communication is highly stable. For example, a lightning strike that affects one channel will not affect devices connected to other channels on the same ioLogik E1500.

Application: Enhanced Efficiency for Remote Monitoring on Rolling Stock

Do you need an EN 50155/50121 compliant remote Ethernet I/O device for use on rolling stock? The ioLogik E1500 railway I/O module features an anti-vibration design, channel isolation, and operates reliably in temperatures ranging from -40 to 85°C, making it the ideal solution for data acquisition on rolling stock. Capable of both monitoring system status and triggering I/O events, the ioLogik E1500 is your best choice when you want to simultaneously enhance system reliability and maintenance efficiency in rolling stock environments.



ioLogik E1510-T Specifications

Inputs and Outputs

Digital Inputs: 12 channels (channel-to-channel isolation)
Isolation: 3k VDC or 2k Vrms

Digital Input

Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to GND):
• On: 0 to 3 VDC
• Off: 10 to 30 VDC
Counter Frequency: 250 Hz
Digital Filtering Time Interval: Software configurable

MTBF (mean time between failures)

Time: 507,064 hrs
Standard: Telcordia SR332

ioLogik E1512-T Specifications

Inputs and Outputs

Digital Inputs: 4 channels (channel-to-channel isolation)
Configurable DIOs (by software): 4 channels
Isolation: 3k VDC or 2k Vrms

Digital Input

Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to GND):
• On: 0 to 3 VDC
• Off: 10 to 30 VDC
Common Type: 2 points per COM (Configurable DIOs)
Counter Frequency: 250 Hz
Digital Filtering Time Interval: Software configurable

Digital Output

Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 500 Hz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C (typical), 150°C (min.)
Current Rating: 200 mA per channel

MTBF (mean time between failures)

Time: 554,122 hrs
Standard: Telcordia SR332

Common Specifications

LAN
Ethernet: 1 10/100 Mbps, M12
Protection: 1.5 kV magnetic isolation
Protocols: Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, HTTP

Power Requirements
Input Voltage: 12 to 48 VDC
Input Current: 150 mA @ 24 VDC
Note: Compliant with EN 50155 at 24 VDC

Physical Characteristics
Wiring: I/O cable max. 14 AWG
Dimensions: 144 x 124 x 30 mm (5.67 x 4.88 x 1.18 in)
Weight: Under 825 g (1.82 lb)
Mounting: DIN-rail (standard), wall (with optional kit)

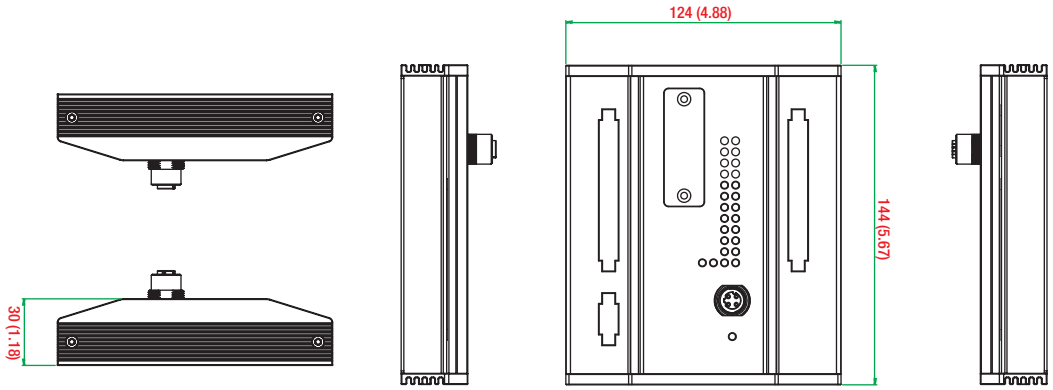
Environmental Limits
Operating Temperature: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
Altitude: Up to 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.
Conformal Coating: Applies only to -CT models

Standards and Certifications
Safety: UL 508
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS:
80 MHz to 1 GHz: 10 V/m
1.4 GHz to 2 GHz: 3 V/m
2 GHz to 2.7 GHz: 1 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Rail Traffic: EN 50155*, EN 50121-3-2, EN 50121-4
*Complies with a portion of EN 50155 specifications.
Green Product: RoHS, CRoHS, WEEE
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Bottom View | Front View | Top View

Ordering Information

Available Models
ioLogik E1510-M12-T: Ethernet remote I/O with M12 connector, 12 DIs, -40 to 85°C operating temperature
ioLogik E1510-M12-CT-T: Ethernet remote I/O with M12 connector, 12 DIs, coating, -40 to 85°C operating temperature
ioLogik E1512-M12-T: Ethernet remote I/O with M12 connector, 4 DIs, 4 DIOs, -40 to 85°C operating temperature
ioLogik E1512-M12-CT-T: Ethernet remote I/O with M12 connector, 4 DIs, 4 DIOs, coating, -40 to 85°C operating temperature

Package Checklist
- ioLogik E1500
- Documentation and software CD
- Quick installation guide (printed)

Optional Accessories (can be purchased separately)
WK-90: Wall-mounting kit, BKTx2 FMSx6 NI Nylok M3x6

ioLogik R1200 Series

RS-485 remote I/O

- Dual RS-485 remote I/O with built-in repeater
- Supports the installation of multidrop communications parameters
- Install communications parameters and upgrade firmware via USB
- Upgrade firmware through an RS-485 connection
- Wide operating temperature range: -40 to 85°C (-40 to 185°F)

Introduction

The ioLogik R1200 RS-485 serial remote I/O devices are perfect for establishing a cost-effective, dependable, and easy-to-maintain remote process control I/O system. Remote serial I/O products offer process engineers the benefit of simple wiring, as they only require two wires to communicate with the controller and other RS-485 devices while adopting the EIA/TIA RS-485 communication protocol to transmit and receive data at high speed over long distances. In addition to communication configuration by software or USB and dual RS-485 port design, Moxa's remote I/O devices eliminate the nightmare of extensive labor associated with the setup and maintenance of data acquisition and automation systems. Moxa also offers different I/O combinations, which provide greater flexibility and are compatible with many different applications.

ioLogik R1200 Series Selection Table

Models	I/O Combinations				
	Digital Inputs	Configurable DIOs	Relays	Analog Inputs	Analog Outputs
ioLogik R1210	16	–	–	–	–
ioLogik R1212	8	8	–	–	–
ioLogik R1214	6	–	6	–	–
ioLogik R1240	–	–	–	8	–
ioLogik R1241	–	–	–	–	4

ioLogik R1210 Specifications

Inputs and Outputs

Digital Inputs: 16 channels
Isolation: 3k VDC or 2k Vrms

Digital Input

Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to COM):
• On: 10 to 30 VDC
• Off: 0 to 3 VDC
Common Type: 8 points per COM
Counter Frequency: 2.5 kHz
Digital Filtering Time Interval: Software Configurable

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current: 154 mA @ 24 VDC

ioLogik R1212 Specifications

Inputs and Outputs

Digital Inputs: 8 channels
Configurable DIOs (by jumper): 8 channels
Isolation: 3k VDC or 2k Vrms

Digital Input

Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open

Wet Contact (DI to COM):
• On: 10 to 30 VDC
• Off: 0 to 3 VDC
Common Type: 8 points per COM
Counter Frequency: 2.5 kHz
Digital Filtering Time Interval: Software Configurable

Digital Output
Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 5 kHz
Over-Voltage Protection: 45 VDC
Over-Current Protection: 2.6 A (4 channels @ 650 mA)
Over-Temperature Shutdown: 175°C (typical), 150°C (min.)
Current Rating: 200 mA per channel

Power Requirements
Input Voltage: 12 to 48 VDC
Input Current: 187 mA @ 24 VDC

ioLogik R1214 Specifications

Inputs and Outputs
Digital Inputs: 6 channels
Relays: 6 channels
Isolation: 3k VDC or 2k Vrms

Digital Input
Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact (DI to COM):
• On: 10 to 30 VDC
• Off: 0 to 3 VDC
Common Type: 6 points per COM
Counter Frequency: 2.5 kHz
Digital Filtering Time Interval: Software Configurable

Relay
Type: Form A (N.O.) power relay
Contact Current Rating: Resistive load: 5 A @ 30 VDC, 250 VAC, 110 VAC
Breakdown Voltage: 500 VAC
Relay On/Off Time: 1500 ms (max.)
Initial Insulation Resistance: 1000 mega-ohms (min.) @ 500 VDC
Mechanical Endurance: 5,000,000 operations
Electrical Endurance: 100,000 operations @ 5 A resistive load
Contact Resistance: 100 milli-ohms (max.)
Pulse Output: 0.3 Hz at rated load
Note: Ambient humidity must be non-condensing and remain between 5 and 95%. The relays of the ioLogik R1214 may malfunction when operating in high condensation environments below 0°C.

Power Requirements
Input Voltage: 12 to 48 VDC
Input Current: 207 mA @ 24 VDC

ioLogik R1240 Specifications

Inputs and Outputs
Analog Inputs: 8 channels
Isolation: 3k VDC or 2k Vrms

Analog Input
Type: Differential input
Resolution: 16 bits
I/O Mode: Voltage / Current (jumper selectable)
Input Range: 0 to 10 VDC, 0 to 20 mA, 4 to 20 mA, 4 to 20 mA (burn-out mode)
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
±0.5% FSR @ -40 and 75°C
Sampling Rate:
• All channels: 12 samples/sec
• Per channel: 1.5 samples/sec
• Only one channel enabled: 12 samples/sec
Input Impedance: 10 mega-ohms (min.)
Built-in Resistor for Current Input: 120 ohms

Power Requirements
Input Voltage: 12 to 48 VDC
Input Current: 216 mA @ 24 VDC

ioLogik R1241 Specifications

Inputs and Outputs
Analog Outputs: 4 channels
Isolation: 3k VDC or 2k Vrms

Analog Output
Resolution: 12 bits
Output Range: 0 to 10 VDC, 0 to 20 mA, 4 to 20 mA
Voltage Output: 10 mA (max.)
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -40 and 75°C
Load Resistor: Internal register: 400 ohms
Note: 24 V of external power required when loading exceeds 1000 ohms.

Power Requirements
Input Voltage: 12 to 48 VDC
Input Current: 343 ma @ 24 VDC

Common Specifications

Serial
Interface: 2 RS-485-2w terminal block ports
Serial Line Protection:
• ESD Protection: 15 kV
• Surge Protection: 1 kV
• High/Low Resistor for RS-485: 1 kΩ, 150 kΩ
Parity: None, Even, Odd
Data Bits: 8
Stop Bits: 1, 2
Baudrate: 1200 to 921600 bps
Protocols: Modbus RTU (slave)

Physical Characteristics
Wiring: I/O cable max. 16 AWG
Dimensions: 27.8 x 124 x 84 mm (1.09 x 4.88 x 3.31 in)
Weight: Under 200 g (0.44 lb)
Mounting: DIN-rail or wall

Environmental Limits
Operating Temperature:
Standard Models: -10 to 75°C (14 to 167°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
Altitude: Up to 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 3 V
IEC 61000-4-8

Green Product: RoHS, CRoHS, WEEE
Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

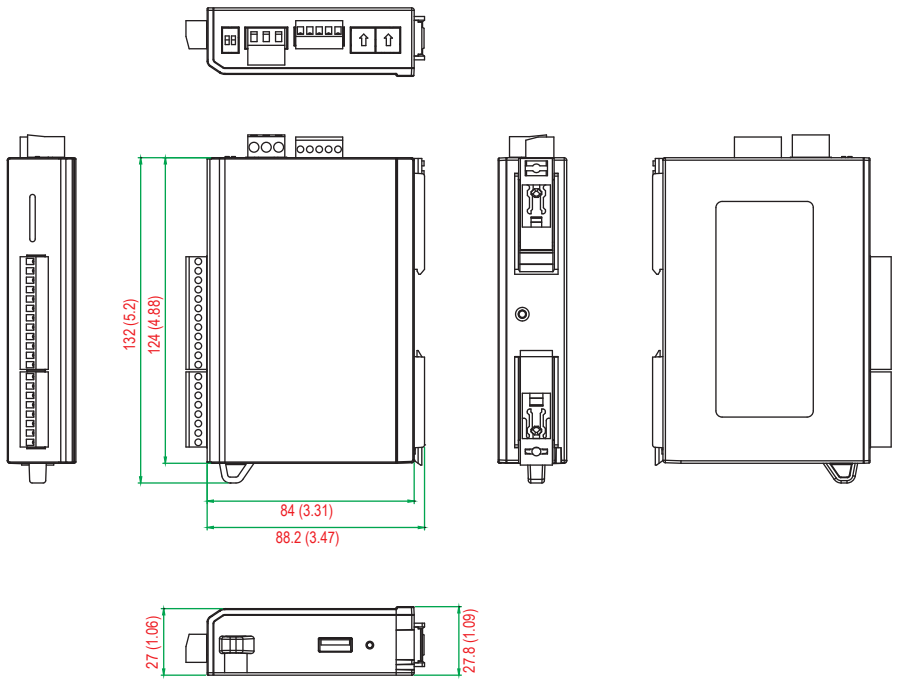
Time: 1,239,293 hrs
Standard: Telcordia SR332

Warranty

Warranty Period: 5 years (excluding the ioLogik R1214)
Details: See www.moxa.com/warranty
Note: Because of the limited lifetime of power relays, products that use this component are covered by a 2-year warranty.

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

ioLogik R1210: RS-485 remote I/O with 16 DIs, -10 to 75°C operating temperature
ioLogik R1210-T: RS-485 remote I/O with 16 DIs, -40 to 85°C operating temperature
ioLogik R1212: RS-485 remote I/O with 8 DIs, 8 DIOs, -10 to 75°C operating temperature
ioLogik R1212-T: RS-485 remote I/O with 8 DIs, 8 DIOs, -40 to 85°C operating temperature
ioLogik R1214: RS-485 remote I/O with 6 DIs, 6 relays, -10 to 75°C operating temperature
ioLogik R1214-T: RS-485 remote I/O with 6 DIs, 6 relays, -40 to 85°C operating temperature
ioLogik R1240: RS-485 remote I/O with 8 AIs, -10 to 75°C operating temperature
ioLogik R1240-T: RS-485 remote I/O with 8 AIs, -40 to 85°C operating temperature
ioLogik R1241: RS-485 remote I/O with 4 AOs, -10 to 75°C operating temperature
ioLogik R1241-T: RS-485 remote I/O with 4 AOs, -40 to 85°C operating temperature

Package Checklist

- ioLogik R1200
- Documentation and software CD
- Quick installation guide (printed)

ioLogik 4000 Series

Modular remote I/O

- I/O expansion without a backplane
- Active communications with MX-AOPC UA Server
- Supports SNMPv1/v2c
- Easy configuration with Modular ioAdmin utility
- Friendly configuration via web browser
- Simplify I/O management with MXIO library on either a Windows or Linux platform

Introduction

The ioLogik 4000 series is suitable for remote monitoring and alarm systems, such as those used for water treatment systems, water supply systems, wastewater treatment systems, and power monitoring systems. These kinds of applications need more I/O points and a variety of I/O types, including temperature sensors, gas detectors, and water quality detectors, all of which can benefit from the versatile mixture of I/O features supported by the ioLogik 4000 series.

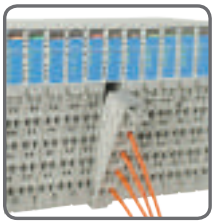
Slice Form Factor and Flexible I/O Variety

The unique modular construction of the ioLogik 4000 series allows the mixing and matching of modules to achieve the best combination of I/O modules to meet the needs of a wide range of remote automation applications. The ioLogik 4000 series features an industrial modular housing that allows I/O modules to be added to the base unit without a backplane. The width of each module is only 12 mm, perfect for space-limited applications. The ioLogik 4000 series provides high density I/O points for greater flexibility and expandability. The modules can connect to virtually any type of sensor, including but not limited to those for temperature, pressure, flow, voltage, current, and contact closure.

Easy Maintenance

The ioLogik 4000 series comes with removable spring-type terminal blocks (RTBs) that allow you to conserve field wiring for future use. Each I/O expansion module can be quickly and easily replaced.

Slice-Type I/O Modules



Removable Terminal Block

Spring-Type Terminal Block

Module Coding Tag

ioLogik E4200 Specifications

LAN

Ethernet: 2 MACs, 10/100 Mbps RJ45 ports
Protection: 1.5 kV magnetic isolation
Protocols: Modbus/TCP (slave), TCP/IP, UDP, DHCP, BOOTP, SNMP, HTTP, SNTP, SMTP

Serial

Interface: 1 RS-232 DB9 male port
Parity: None
Stop Bits: 1
Flow Control: 115200 bps
Protocols: For Moxa OnCell only

Power Requirements

Input Voltage: 11 to 28.8 VDC
Input Current: 175 mA @ 24 VDC
Current for I/O Modules: 1.5 A (max.) @ 5 VDC

Physical Characteristics

Weight: 180 g (0.40 lb)

MTBF (mean time between failures)

Time: 357,000 hrs
Standard: Telcordia SR332

NA-4010 Specifications

LAN
Ethernet: 1 10/100 Mbps RJ45 port
Protocols: Modbus/TCP (slave), HTTP, BOOTP
IP Settings: ARP, BOOTP, static IP

Power Requirements
Input Voltage: 11 to 28.8 VDC
Input Current: 60 mA @ 24 VDC
Current for I/O Modules: 1.5 A (max.) @ 5 VDC

Physical Characteristics
Weight: 150 g (0.33 lb)

MTBF (mean time before failures)
Time: 4,739,300 hrs
Standard: Telcordia SR332

NA-4020/4021 Specifications

Serial
Interface:
• NA-4020: 1 RS-485-2w terminal block port
• NA-4021: 1 RS-232 DB9 female port
Parity: None, Even, Odd
Data Bits: 7, 8
Stop Bits: 1, 2
Baudrate: 1200 to 115200 bps
Protocols: Modbus/RTU (slave), Modbus/ASCII (slave)

Power Requirements
Input Voltage: 11 to 28.8 VDC
Input Current: 70 mA @ 24 VDC
Current for I/O Modules: 1.5 A (max.) @ 5 VDC

Physical Characteristics
Weight: 150 g (0.33 lb)

MTBF (mean time between failures)
NA-4020 Time: 4,694,800 hrs
NA-4021 Time: 5,208,300 hrs
Standard: Telcordia SR332

Common Specifications

Field Power
Rated Voltage: 11 to 28.8 VDC
Current in Field Power Contact: 10 A (max.)

Physical Characteristics
Wiring: I/O cable max. 14 AWG
Dimensions: 45 x 99 x 70 mm (1.77 x 3.90 x 2.76 in)
Mounting: DIN rail

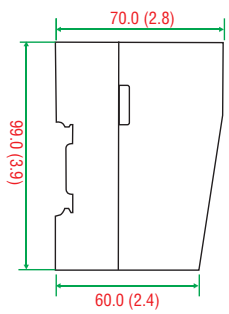
Environmental Limits
Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
Altitude: Up to 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

Standards and Certifications
Safety: UL 508
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS:
80 MHz to 1 GHz: 10 V/m
1.4 GHz to 2 GHz: 3 V/m
2 GHz to 2.7 GH: 1 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 1 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8

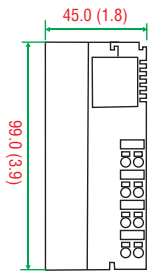
Dimensions

Unit: mm (inch)

I/O Network Adapter

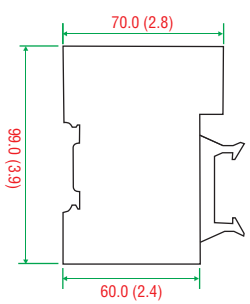


Side View

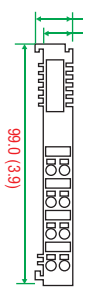


Front View

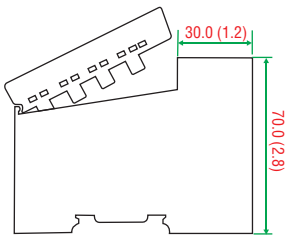
I/O Module



Side View



Front View



Removable View

Ordering Information

Step 1: Select a network adapter module

ioLogik E4200 or NA-4000 series

Step 2: Select I/O modules

M-1000/2000/3000/4000/6000 series

Step 3: Select power modules (optional)

M-7000 series

Available Models

ioLogik E4200: Modular Ethernet remote I/O adapter with Click&Go, up to 16 I/O modules, -10 to 60°C operating temperature
NA-4010: Modular Ethernet remote I/O adapter with up to 32 I/O modules, -10 to 60°C operating temperature
NA-4020: Modular RS-485 remote I/O adapter with up to 32 I/O modules, -10 to 60°C operating temperature
NA-4021: Modular RS-232 remote I/O adapter with up to 32 I/O modules, -10 to 60°C operating temperature
Note: The ioLogik E4200 Modular Ethernet remote I/O adapter can be expanded with up to 16 I/O modules. The NA-4010 and NA-4020/4021 network adapters can be expanded with up to 32 I/O modules.

Package Checklist

- ioLogik 4000 series
- I/O modules (sold separately)
- Power modules (sold separately)
- Documentation and software CD
- Quick installation guide (printed)

ioLogik 4000 Expansion Modules

Digital Input Modules

M-1800: 8 digital inputs, sink type, 24 VDC

Digital Inputs: 8 channels
Type: sink
On-state Voltage: 24 VDC nominal, 11 to 28.8 VDC
Off-state Voltage: 0 to 5 VDC
On-state Current: 6 mA/point @ 28.8 VDC (max.)
Input Impedance: 5.1 kilo-ohms (typical)
Filtering Time: 1.5 ms (typical)
Common Type: External common (single common)
Input Current: 35 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. 14 AWG
MTBF: 15,759,240 hrs (Standard: Telcordia SR332)

M-1801: 8 digital inputs, source type, 24 VDC

Digital Inputs: 8 channels
Type: source
On-state Voltage: 24 VDC nominal, 11 to 28.8 VDC
Off-state Voltage: 0 to 5 VDC
On-state Current: 6 mA/point @ 28.8 VDC (max.)
Input Impedance: 5.1 kilo-ohms (typical)
Filtering Time: 1.5 ms (typical)
Common Type: External common (single common)
Input Current: 35 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. 14 AWG
MTBF: 15,811,800 hrs (Standard: Telcordia SR332)

M-1600: 16 digital inputs, sink type, 24 VDC

Digital Inputs: 16 channels
Type: sink
On-state Voltage: 24 VDC nominal, 11 to 28.8 VDC
Off-state Voltage: 0 to 5 VDC
On-state Current: 6 mA/point @ 28.8 VDC (max.)
Input Impedance: 5.1 kilo-ohms (typical)
Filtering Time: 1.5 ms (typical)
Common Type: 16 channels for 2 COMs (single common)
Input Current: 40 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O flat cable 20-pin
MTBF: 11,659,560 hrs (Standard: Telcordia SR332)

M-1601: 16 digital inputs, source type, 24 VDC

Digital Inputs: 16 channels
Type: source
On-state Voltage: 24 VDC nominal, 11 to 28.8 VDC
Off-state Voltage: 0 to 5 VDC
On-state Current: 6 mA/point @ 28.8 VDC (max.)
Input Impedance: 5.1 kilo-ohms (typical)
Filtering Time: 1.5 ms (typical)
Common Type: 16 channels for 2 COMs (single common)
Input Current: 40 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O flat cable 20-pin
MTBF: 11,694,600 hrs (Standard: Telcordia SR332)

M-1450: 4 digital inputs, 110 VAC

Digital Inputs: 4 channels, 110 VAC
On-state Voltage: 120 VAC nominal, 85 to 132 VAC
Off-state Voltage: 0 to 45 VAC
On-state Current: 8 mA/point @ 132 VAC (max.)
Input Impedance: 11 kilo-ohms (typical)
Common Type: 4 channels for 2 COMs (single common)
Input Current: 35 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. 14 AWG
MTBF: 19,482,240 hrs (Standard: Telcordia SR332)

M-1451: 4 digital inputs, 220 VAC

Digital Inputs: 4 channels, 220 VAC
On-state Voltage: 240 VAC nominal, 170 to 264 VAC
Off-state Voltage: 0 to 45 VAC
On-state Current: 12 mA/point @ 264 VAC (max.)
Input Impedance: 22 kilo-ohms (typical)
Common Type: 4 channels for 2 COMs (single common)
Input Current: 35 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. 14 AWG
MTBF: 19,727,520 hrs (Standard: Telcordia SR332)

Digital Output Modules

M-2800: 8 digital outputs, sink type, 24 VDC, 0.5 A

Digital Outputs: 8 channels
Type: sink
Output Range: 24 VDC nominal
On-state Voltage Drop: 0.3 VDC @ 25°C (max.)
On-state Current: 1 mA per channel (min.)
Off Leakage Current: 50 μA (max.)
Current Rating: 0.5 A per channel
Common Type: 8 channels per external common (single common)
Input Current: 60 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. 14 AWG
MTBF: 13,884,600 hrs (Standard: Telcordia SR332)

M-2801: 8 digital outputs, source type, 24 VDC, 0.5 A

Digital Outputs: 8 channels
Type: source
Output Range: 24 VDC nominal
On-state Voltage Drop: 0.3 VDC @ 25°C (max.)
On-state Current: 1 mA per channel (min.)
Off Leakage Current: 50 μA (max.)
Current Rating: 0.5 A per channel
Common Type: 8 channels per external common (single common)
Input Current: 60 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. 14 AWG
MTBF: 14,340,120 hrs (Standard: Telcordia SR332)

M-2600: 16 digital outputs, sink type, 24 VDC, 0.3 A

Digital Outputs: 16 channels
Type: sink
Output Range: 24 VDC nominal
On-state Voltage Drop: 0.3 VDC @ 25°C (max.)
On-state Current: 1 mA per channel (min.)
Off Leakage Current: 50 µA (max.)
Current Rating: 0.5 A per channel
Common Type: 8 channels per external common (single common)
Input Current: 60 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O flat cable 20-pin
MTBF: 9,732,360 hrs (Standard: Telcordia SR332)

M-2601: 16 digital outputs, source type, 24 VDC, 0.3 A

Digital Outputs: 16 channels
Type: source
Output Range: 24 VDC nominal
On-state Voltage Drop: 0.3 VDC @ 25°C (max.)
On-state Current: 1 mA per channel (min.)
Off Leakage Current: 50 µA (max.)
Current Rating: 0.5 A per channel
Common Type: 8 channels per external common (single common)
Input Current: 60 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O flat cable 20-pin
MTBF: 9,749,880 hrs (Standard: Telcordia SR332)

Analog Input Modules

M-3802: 8 analog inputs, 4 to 20 mA, 12 bits

Analog Inputs: 8 channels
Resolution in Ranges: 12 bits, 3.91 µA/bit
Input Current Range: 4 to 20 mA (single-ended)
Data Format: 16-bit integer (2's complement)
Accuracy:
• ±0.1%, FSR @ 25°C
• ±0.3%, FSR @ 0°C, 60°C
Input Impedance: 120 ohms
Conversion Time: 4 ms for all channels
Input Current: 80 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. 14 AWG
MTBF: 7,375,920 hrs (Standard: Telcordia SR332)

M-3810: 8 analog inputs, 0 to 10 V, 12 bits

Analog Inputs: 8 channels
Resolution in Ranges: 12 bits, 2.44 mV/bit
Input Current Range: 0 to 10 VDC (single-ended)
Data Format: 16-bit integer (2's complement)
Accuracy:
• ±0.1%, FSR @ 25°C
• ±0.3%, FSR @ 0°C, 60°C
Input Impedance: 500 kilo-ohms
Conversion Time: 4 ms for all channels
Input Current: 60 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. 14 AWG
MTBF: 7,288,320 hrs (Standard: Telcordia SR332)

Analog Output Modules

M-4402: 4 analog outputs, 4 to 20 mA, 12 bits

Analog Outputs: 4 channels
Resolution in Ranges: 12 bits, 3.91 µA/bit
Output Current Range: 4 to 20 mA (single-ended)
Data Format: 16-bit integer (2's complement)
Accuracy:
• ±0.1%, FSR @ 25°C
• ±0.3%, FSR @ 0°C, 60°C
Output Impedance: 500 ohms (max.)
Conversion Time: 2 ms for all channels
Input Current: 60 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. 14 AWG
MTBF: 7,840,200 hrs (Standard: Telcordia SR332)

M-4410: 4 analog outputs, 0 to 10 V, 12 bits

Analog Outputs: 4 channels
Resolution in Ranges: 12 bits, 2.44 mV/bit
Output Current Range: 0 to 10 VDC (single-ended)
Data Format: 16-bit integer (2's complement)
Accuracy:
• ±0.1%, FSR @ 25°C
• ±0.3%, FSR @ 0°C, 60°C
Output Impedance: 5 kilo-ohms (max.)
Conversion Time: 2 ms for all channels
Input Current: 60 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. 14 AWG
MTBF: 6,219,600 hrs (Standard: Telcordia SR332)

Temperature Input Modules

M-6200: 2 analog inputs, RTD: PT100, JPT100

RTDs: 2 channels
Sensor Types:
• PT50, PT100, PT200, PT500, PT1000 (resistance 100 milli-ohms/bit)
• JPT100, JPT200, JPT500, JPT1000 (resistance 10 milli-ohms/bit)
• NI100, NI200, NI500, NI1000, NI120, CU10 (resistance 20 milli-ohms/bit)
Resolution: 0.1°C per 10 milli-ohms
Data Format: 16-bit integer (2's complement)
Accuracy:
• ±0.1%, FSR @ 25°C
• ±0.3%, FSR @ 0°C, 60°C
Input Impedance: 500 kilo-ohms
Conversion Time: 200 ms for all channels
Diagnostics: Range over (if range over, data=Dx8000)
Input Current: 80 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. 14 AWG
MTBF: 3,644,160 hrs (Standard: Telcordia SR332)

M-6201: 2 analog inputs, thermocouple

Thermocouples: 2 channels
Sensor Types: Type J/K/T/E/R/S/B/N/L/U/C/D (mV input 10 µV/bit, 2 µV/bit)
Resolution: 0.1°C/10 µV
Data Format: 16-bit integer (2's complement)
Accuracy:
• ±0.1%, FSR @ 25°C
• ±0.3%, FSR @ 0°C, 60°C
Input Impedance: 500 kilo-ohms
Conversion Time: 200 ms for all channels
Diagnostics: Range over (if range over, data=Dx8000)
Input Current: 80 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. 14 AWG
MTBF: 3,828,120 hrs (Standard: Telcordia SR332)

Power Modules

M-7001: System power module

System Input Voltage: 24 VDC, 11 to 28.8 VDC
Field Power Input Voltage: 24 VDC (±20%)
Current for I/O Modules: 1.5 A @ 5 VDC (max.)
System Bus Output Voltage: 5 VDC (max.)
Field Power Contacts Current: 10 A (max.)
MTBF: 19,569,840 hrs (Standard: Telcordia SR332)

M-7002: Field power module

Field Power Input Voltage:
• DC: 5 VDC, 24 VDC, 48 VDC
• AC: 110 VAC, 220 VAC
Current for Field Power Contacts: 10 A (max.)
MTBF: 75,528,720 hrs (Standard: Telcordia SR332)

M-7804: 0 VDC

Channels: 8
Mode: 0 VDC
MTBF: 73,750,440 hrs (Standard: Telcordia SR332)

M-7805: 24 VDC

Channels: 8
Mode: 24 VDC
MTBF: 73,750,440 hrs (Standard: Telcordia SR332)

Modular I/O Accessories

TB 1600: Screw-locking terminal block with 20-pin connector for DIN-rail mounts

Pins: 20 pins, one-to-one assignment
Connector Pitch: 3.81 mm
Mounting Type: DIN-rail
Dimensions: 77.5 x 67.5 x 51 mm
(3.05 x 2.66 x 2.01 in)
Compliance: RoHS compliant

Cable: 20-to-20-pin flat cable

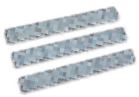
Usage: Connects between the TB 1600 and ioLogik 4000 series
Length: 500 mm
Number of Pins: 20

M-8001-PK: Removable terminal block

Usage: Terminal block for the ioLogik 4000 series
Packaging: 9 pcs in one box

Markers: For the ioLogik 4000 series

M-8003-PK: Markers with 0 to 9 numbering; 100 pcs per box
M-8004-PK: Blank markers; 100 pcs per box



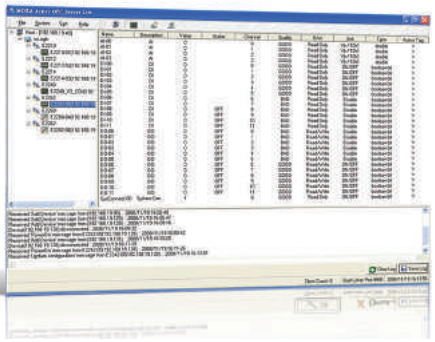
Ordering Information

Available Models

M-1800: Modular remote I/O module with 8 DIs, sink type, 24 VDC, RTB, -10 to 60°C operating temperature
M-1801: Modular remote I/O module with 8 DIs, source type, 24 VDC, RTB, -10 to 60°C operating temperature
M-1600: Modular remote I/O module with 16 DIs, sink type, 24 VDC, 20-pin, -10 to 60°C operating temperature
M-1601: Modular remote I/O module with 16 DIs, source type, 24 VDC, 20-pin, -10 to 60°C operating temperature
M-1450: Modular remote I/O module with 4 DIs, 110 VAC, RTB, -10 to 60°C operating temperature
M-1451: Modular remote I/O module with 4 DIs, 220 VAC, RTB, -10 to 60°C operating temperature
M-2800: Modular remote I/O module with 8 DOs, sink type, 24 VDC, RTB, -10 to 60°C operating temperature
M-2801: Modular remote I/O module with 8 DOs, source type, 24 VDC, RTB, -10 to 60°C operating temperature
M-2600: Modular remote I/O module with 16 DOs, sink type, 24 VDC, 20-pin, -10 to 60°C operating temperature
M-2601: Modular remote I/O module with 16 DOs, source type, 24 VDC, 20-pin, -10 to 60°C operating temperature
M-2450: Modular remote I/O module with 4 relays, 230 VAC/24 VDC, RTB, -10 to 60°C operating temperature
M-3802: Modular remote I/O module with 8 AIs, 4 to 20 mA, RTB, -10 to 60°C operating temperature
M-3810: Modular remote I/O module with 8 AIs, 0 to 10 VDC, RTB, -10 to 60°C operating temperature
M-4402: Modular remote I/O module with 4 AOs, 4 to 20 mA, RTB, -10 to 60°C operating temperature
M-4410: Modular remote I/O module with 4 AOs, 0 to 10 VDC, RTB, -10 to 60°C operating temperature
M-6200: Modular remote I/O module with 2 RTDs, RTB, -10 to 60°C operating temperature
M-6201: Modular remote I/O module with 2 TCs, RTB, -10 to 60°C operating temperature
M-7001: Modular remote I/O module with 24 VDC system power input, RTB, -10 to 60°C operating temperature
M-7002: Modular remote I/O module with 5/24/48 VDC or 110/220 VAC field power input, RTB, -10 to 60°C operating temperature
M-7804: Modular remote I/O module with 8 channels 0 VDC output, RTB, -10 to 60°C operating temperature
M-7805: Modular remote I/O module with 8 channels 24 VDC output, RTB, -10 to 60°C operating temperature

Optional Accessories

TB 1600: Screw-locking terminal block with 20-pin connector for DIN-rail mounting
20-to-20-pin flat cable: 20-pin to 20-pin flat cable, 500 mm
M-8001-PK: Removable terminal block, 9 pcs per pack
M-8003-PK: Marker with 0 to 9 numbering, white color, 100 pcs
M-8004-PK: Black marker, 100 pcs



Automation Software

Automation Software

Introduction to Automation Software 18-2

OPC UA/DA Suite

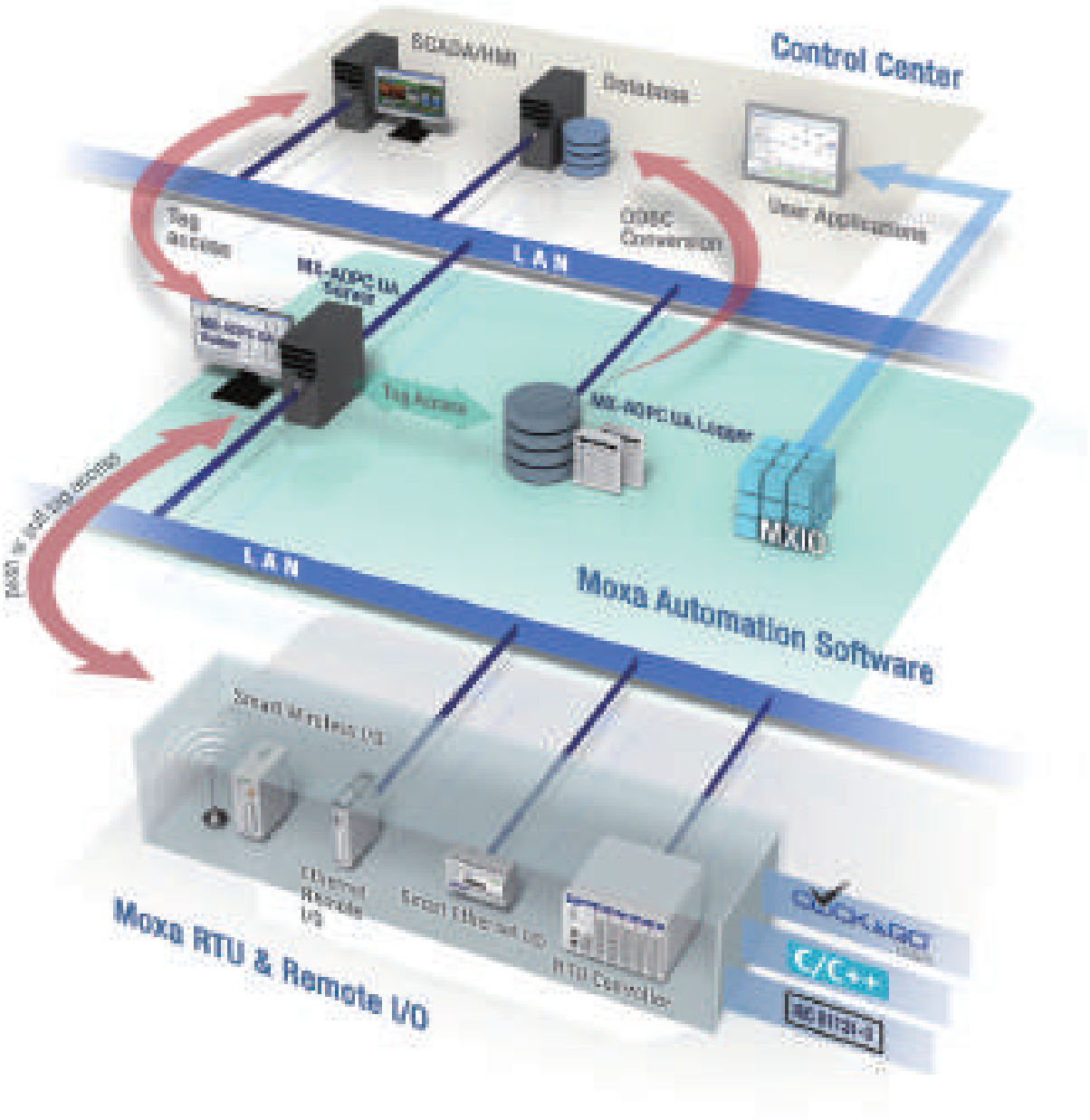
MX-AOPC UA Suite: Cohesive, secure, and reliable connection between device, database, and SCADA 18-3

I/O Library

MXIO Programming Library: For handy management of I/O devices 18-6

Introduction to Automation Software

Moxa's automation software includes the MX-AOPC UA Suite and the MXIO programming library. The MX-AOPC UA Suite consists of MX-AOPC UA Server, MX-AOPC UA Viewer, and MX-AOPC UA Logger; it is a unified architecture that brings together remote industrial control systems from discrete stations and unifies them under a single, centralized monitoring and control system. MX-AOPC UA Server expands upon Moxa's patented Active OPC monitoring technology, bringing Modbus protocol support, and providing a secure and reliable gateway between local devices and a remote SCADA system. MX-AOPC UA Viewer is an OPC client that allows users to easily view tag values and MX-AOPC UA Server status. MX-AOPC UA Logger is another handy client, which allows users to convert and upload data logs into a database. The MXIO Library offers a large repository of code for users to easily manage Moxa's RTU or remote I/O devices over an Ethernet network.



MX-AOPC UA Suite

Cohesive, secure, and reliable connection between device, database, and SCADA

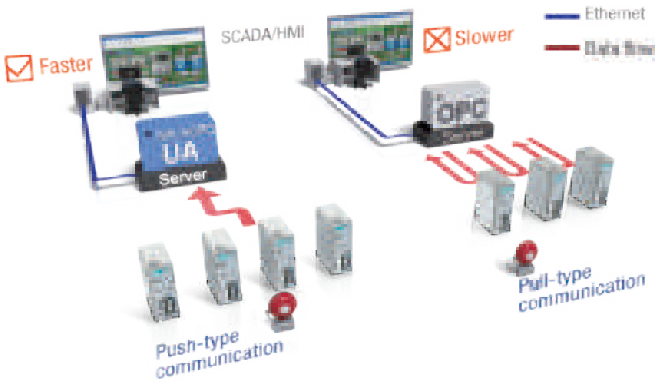
- First OPC UA server for industrial automation supporting both push and pull communication
- One-click active tag creation
- Efficient database uploads
- Automatic data updates from SD cards following network failures
- Simple and easy viewing of tag values and UA server status
- OPC UA: The next generation of interoperability, reliability, and security

Introduction

The MX-AOPC UA Suite includes MX-AOPC UA Server, Viewer, and Logger, which are all based on the OPC UA (Unified Architecture) standard. OPC UA is the next generation OPC standard (IEC 62541), which provides a cohesive, secure, and reliable framework for accessing real-time and historical data. MX-AOPC UA Server not only inherits Moxa's patented active monitoring technology, but also supports Modbus protocol for polling data, to provide a secure and reliable gateway bridging edge devices to the SCADA system. MX-AOPC UA Viewer is an OPC UA client that allows users to easily view tag values and server statuses. MX-AOPC UA Logger is another handy client for converting and uploading data logs to the central database. With Moxa's MX-AOPC UA Suite, users can now instantly receive alarms, real-time updates, and save historical data, allowing for both timely risk prevention and solid maintenance response.

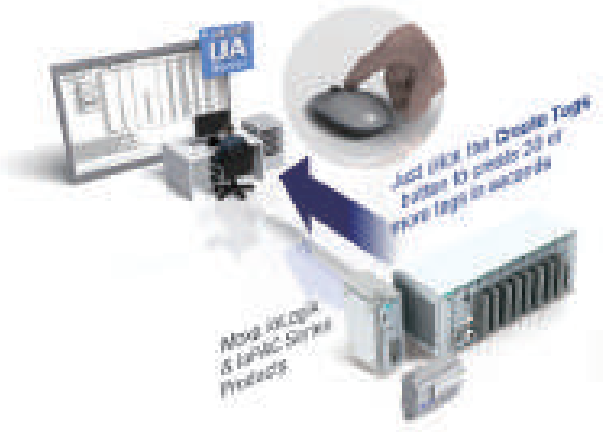
First OPC UA Server for Industrial Automation Supporting both Push and Pull Communication

Moxa has pioneered the concept of "active type" OPC software in the automation industry. The patented MX-AOPC UA Server offers both polling and non-polling architectures alongside the standard OPC UA protocol, giving users the alternative of pull- or push-based communication from Moxa's devices. With push technology, I/O status is updated to MX-AOPC UA Server only when there is an I/O status change, a pre-configured interval is reached, or when a request is issued by a user. This application of push technology cuts metadata overhead, resulting in faster I/O response times and more accurate data collection than traditional pull-based architectures. With Moxa's "active technology" advantage, users can now instantly receive alarms and real time updates, allowing for timely risk response.



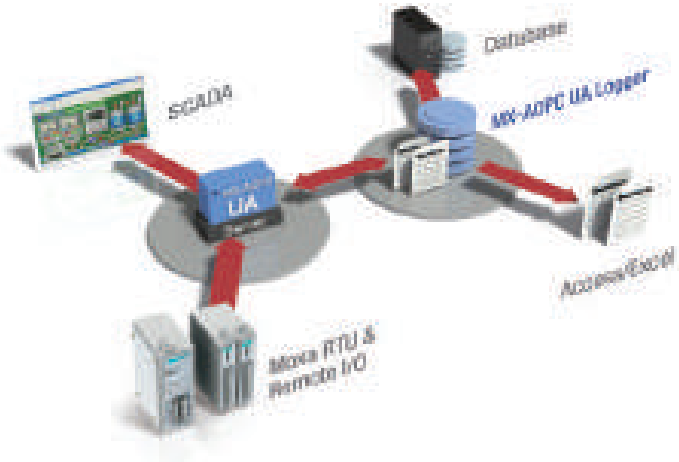
One-Click Active Tag Creation

MX-AOPC UA Server supports automatic tag generation, which eliminates the headache of specifying individual target IP addresses, I/O channels, and data formats, and does away with the need to edit and import configuration files. Working from Moxa's utilities, users only need to select specific tags, set the update criteria, and then click a single button for their active tags to be automatically generated and configured.



Efficient Database Uploads

With most remote data acquisition systems, during daily operations additional human resources are needed to collect data manually from remote storage devices for loading into a database. Even with RTUs remotely collecting data over the network, software must be developed to handle the task of converting and uploading these data logs. Moxa's MX-AOPC UA Logger not only makes real-time data collection much easier, it also simplifies the conversion of historical data into database-ready formats. MX-AOPC UA Logger interacts directly with our MX-AOPC UA Server, working as a bridge between field data and stored databases or spreadsheets. Furthermore, the MX-AOPC client converts and uploads data logs to the central database. The MX-AOPC UA Logger can collate tags from individual Moxa RTUs or remote I/O devices into the same database or spreadsheet, freeing users from the need to manipulate data after processing.



Automatic Data Updates from SD Cards Following Network Failures

One of the benefits of using RTUs is that data can be collected over a network from a central site. In an ideal operation, following a network failure RTUs should be able to transmit data logs that were collected while the network was offline. Moxa's MX-AOPC UA Logger makes this not only possible, but easy. MX-AOPC UA Logger provides a standard OPC interface that interacts with MX-AOPC UA Server for real-time data collection. After each network connection, MX-AOPC UA Logger will compare historical data stored on the SD cards located in individual devices with the real time data it has already stored locally, and then supplement any missing data by requesting that the RTU retransmit the lost data.

Simple and Easy Viewing of Tag Values and UA Server Status

MX-AOPC UA Viewer is an OPC UA client that allows developers, testers, and integrators to easily view tag values and test MX-AOPC UA Server and connections. The viewer's intuitive user interface makes it easy to read data and server status. With this handy client tool, users can complete OPC server settings sooner than ever.

OPC UA: The Next Generation of Interoperability, Reliability, and Security

Moxa's MX-AOPC UA Suite is designed based on the OPC Foundation's UA (Unified Architecture) specification. OPC UA is a new technology that features more secure and reliable data communication between OPC servers and clients. It ensures protection against unauthorized access or sabotage of process data, as well as against errors due to careless operation. In addition, OPC UA defines a robust architecture with reliable communication mechanisms, configurable timeouts, and automatic error detection/recovery mechanisms. By using Moxa's MX-AOPC UA Suite, users can enjoy more secure and reliable data exchange and control.

Specifications

Hardware Requirements

CPU: Intel Pentium 4 or above
RAM: 512 MB (1024 MB recommended)
Communication Interface: Ethernet or serial

Software Requirements

Operating System: Microsoft Windows 7/8/10, Microsoft Windows Server 2003/2008/2012
Editor (optional): Microsoft Office 2003 (Access or Excel) or later
Database (optional): Oracle database, Microsoft SQL Server

OPC UA Server Specifications

OPC Unified Architecture: 1.01
OPC Data Access: 1.0a, 2.0, 2.05a, 3.0
Device Protocols: Moxa AOPC, Modbus/TCP (master), Modbus/RTU (master)

OPC UA Logger Specifications

OPC Unified Architecture: 1.01

Products that Support the AOPC Protocol

Series Names: ioLogik 2500 series, ioLogik E1200 series, ioLogik E1500 series, ioLogik E2200 series, ioLogik E4200, ioLogik W5300 series
Note: Please check Moxa's website for the most up-to-date list of supported products.

Ordering Information

Available Versions

MX-AOPC UA Server (trial version): 30-day trial version that supports up to 30 device connections (now available for download from Moxa's website)
MX-AOPC UA Server (free version): Free version that supports up to 30 device connections, with unlimited runtime operations (download trial version first; requires registering your PC User Code* on Moxa's website at http://license.moxa.com/)
MX-AOPC UA Server (paid version): Unlimited device connections and runtime operations (requires purchasing a registration code from Moxa)
MX-AOPC UA Logger (trial version): 30-day trial version that supports up to 1 MX-AOPC UA Server connection and up to 1 data logger (now available for download from Moxa's website)
MX-AOPC UA Logger (free version): Free version that supports up to 1 MX-AOPC UA Server connection and up to 1 data logger, with unlimited runtime operations (download trial version first; requires registering your PC User Code* on Moxa's website at http://license.moxa.com/)
MX-AOPC UA Logger (paid version): Up to 2 MX-AOPC UA Server connections and up to 10 data loggers and runtime operations (requires purchasing a registration code from Moxa)

***How to Obtain a PC User Code:**

1. Select the Help menu from MX-AOPC UA Server or Logger, and then click Licensing > License Info
2. After registering, save the license file to your PC.
3. Unzip the file and then import it into MX-AOPC UA Server or Logger from Help > Licensing > Add License File

MXIO Programming Library

For handy management of I/O devices

An Intuitive Method for Obtaining Remote I/O Data

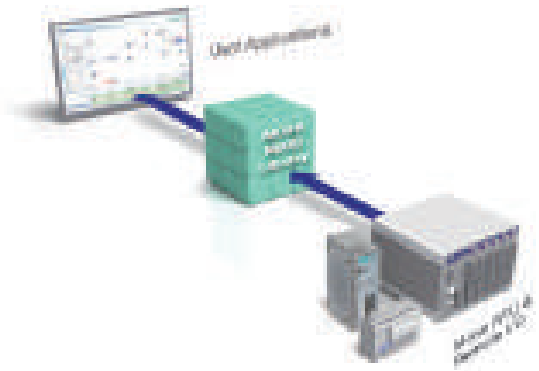
The MXIO Library is a set of programming tools for developing data management applications for use on Ethernet or RS-485 networks linking Moxa's RTUs and remote I/O devices. It includes direct I/O command sets that provide a more intuitive method for obtaining I/O data. Software developers no longer need to study the complex Modbus protocol to manage I/O monitoring and control functions, and engineers can obtain I/O data by using MXIO's direct I/O commands to access any I/O point or channel with ease.

Reduce Development Times with a Large Code Repository

The MXIO library includes many examples of sample code to help programmers reduce software development time and quickly get familiar with the API. Developers can call MXIO functions and demo programs as soon as they have installed the library.

Fully Exploit Active Communications

The MXIO Library provides active functions for receiving I/O configurations and status updates from Moxa's RTU and remote I/O products. With revolutionary push technology, users can benefit from faster and more accurate data collection than traditional polling servers.



Specifications

Hardware Requirements

CPU: Intel Pentium 4 or above
RAM: 512 MB (1024 MB recommended)
Network Interface: 10/100M Ethernet

Software Requirements

Operating System: Microsoft Windows 7/8/10, Microsoft Windows Server 2003/2008/2012, Linux Debian 7.8
Note: Please check Moxa's website for the most up-to-date supported operating systems.

Supported Products

Series Names: ioLogik 2500 series, ioLogik E1200 series, ioLogik R1200 series, ioLogik E1500 series, ioLogik E2200 series, ioLogik R2140, ioLogik E4200, ioLogik W5300 series
Note: Please check Moxa's website for the most up-to-date supported products.

IP Surveillance

Product Selection Guide

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IP Cameras

VPort 66-2MP Series: Rugged Full HD day-and-night box type zoom cameras 19-7
VPort 56-2MP Series: 1080P, rugged, day-and-night zoom IP cameras 19-10
VPort 36-2L Series: 1080P, day-and-night, rugged box IP cameras 19-12
VPort 36-1MP Series: HD, rugged, day-and-night box type IP cameras 19-14
VPort 26A-1MP Series: HD, IP66, vandal-proof, day and night, fixed dome IP cameras 19-17
VPort P16-1MP-M12 Series: EN 50155 compliant, HD video image, rugged IP cameras 19-19
VPort P16-2MR Series: EN 50155 compliant, 1080P video image, infrared IP cameras 19-21
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Camera Accessories 19-35

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MXNVR-RO-T: Industrial network video recorder for harsh environments 19-41

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VPort Video Gadget: Coding-free programming method specially designed for SCADA systems 19-47

IP Cameras

	IP Cameras				
			Preliminary		
	VPort 66-2MP	VPort 56-2MP	VPort 36-2L	VPort 36-1MP Series	VPort 26A-1MP Series
Video Performance					
Resolution (max.)	1920 x 1080	1920 x 1080	1920 x 1080	1280 x 800	1280 x 800
FPS (max.)	60	30	30	30	30
Connections (max.)	5 unicast 50 multicast RTSP	10 unicast 50 mulitcast RTSP	5 unicast 50 multicast RTSP	5 unicast 50 mulitcast RTSP	5 unicast 50 mulitcast RTSP
Video Stream					
H.264	✓	✓	✓	✓	✓
MJPEG	✓	✓	✓	✓	✓
No. of Streams	3	3	4	3	3
DynaStream™	✓	✓	✓	✓	✓
CBR Pro™	✓	✓	✓	✓	✓
Image Stabilizer	✓	✓	✓	–	–
Camera					
Image Sensor	1/2.8" CMOS	1/2.8" CMOS	1/3" CMOS	1/2.7" CMOS	1/2.7" CMOS
Lens (mm)	4.3 to 94.6, 4.3 to 129	6.3 to 63, zoom lens	3 to 9, 10 to 23	C/CS-mount lenses	3 to 9, vari-focal lens
Day & Night	✓	✓	✓	✓	✓
Minimum Illumination	0.4 Lux @ F1.6, color 0.03 Lux @ F1.6, B/W	2 Lux @ F1.8, Color 0.1 Lux @ F1.8, B/W	0.2 Lux @ F1.2, color 0.05 Lux @ F1.2, B/W	0.2 Lux @ F1.2, color 0.05 Lux @ F1.2, B/W	0.2 Lux @ F1.2, color 0.05 Lux @ F1.2, B/W
White Balance	ATW/AWB	ATW/AWB	ATW/AWB	ATW/AWB	ATW/AWB
Electronic Shutter (sec)	Auto (1/120 to 1/16000)	Auto (1/50 to 1/10000)	Auto (1/30 to 1/25000)	Auto (1/30 to 1/25000)	Auto (1/30 to 1/25000)
Sense up	✓	✓	✓	–	–
AGC Control	✓	✓	✓	✓	✓
Wide Dynamic Range	✓	–	✓	✓	✓
Back Light Compensation	✓	✓	✓	–	–
Auto Exposure	✓	✓	✓	✓	✓
Image Rotation (flip, mirror, 180° rotation)	✓	✓	✓	✓	✓
Digital Noise Reduction	✓	✓	✓	✓	✓
Network Connections					
10/100 Mbps, M12 Connector	–	–	–	–	–
10/100 Mbps, RJ45 Connector	1	1	1	1	1
100 Mbps Fiber Connector	–	1, single-model	1, single-model	–	–
Peripherals					
Audio	1 line-in, 1 line-out	1 line-in, 1 line-out	1 line-in, 1 line-out	–	1 line-in, 1 line-out
DI/Relay	1 DI, 1 relay	1 DI, 1 relay	1 DI, 1 relay	1 DI, 1 relay	1 DI, 1 relay
SD Slot	1, SDXC	1, SDHC/SDXC	1, SDXC	1, SDHC	1, SDHC
Network Management and Control					
Web Browser	✓	✓	✓	✓	✓
SNMP Protocols	v1/v2c/v3	v1/v2c/v3	v1/v2c/v3	v1/v2c/v3	v1/v2c/v3
RTSP (Real Time Streaming Protocol)	✓	✓	✓	✓	✓
Multicast (IGMP)	v3	v3	v3	v3	v3
QoS	✓	✓	✓	✓	✓
Automatic Configuration	–	–	–	DHCP Opt 66/67	–
Form Factor					
Protection Rating	IP66	IP30	IP30	IP30	IP66
Surface/Ceiling Mounting	✓	✓	✓	✓	✓
Flush Mounting	–	–	–	–	–
Outdoor Installation Accessory	✓	✓	✓	✓	✓
Power Requirements					
Power-over-Ethernet (PoE)	–	✓ (PoE+)	✓	✓	✓
12/24 VDC, 24 VAC	✓	✓	✓	✓	✓
Alarms					
VMD (Video Motion Detection)	✓	✓	✓	✓	✓
Alarm Snapshot Image	✓	✓	✓	✓	✓
Tamper Alarm	✓	✓	✓	✓	✓
Supported Operating Temperature Ranges					
Standard Models	-40 to 65°C (-40 to 149°F)	0 to 60°C (32 to 140°F)	-25 to 60°C (13 to 140°F)	0 to 60°C (32 to 140°F)	-40 to 50°C (-40 to 122°F)
Wide Temp. Models	–	-40 to 75°C (-40 to 167°F)	-40 to 75°C (-40 to 167°F)	-40 to 75°C (-40 to 167°F)	-40 to 75°C (-40 to 167°F)
Regulatory Approvals					
CE/FCC	✓	✓	✓	✓	✓
UL 60950-1	✓	✓	✓	✓	✓
EN 50155:2007	–	–	–	–	–
EN 50121-3-2	–	–	–	–	–
EN 50121-4	✓	✓	✓	✓	✓
NEMA TS2	✓	✓	✓	✓	–
Class 1 Division 2 / Atex Zone 2	–	–	–	✓	–
EN 62262	IK10	–	–	–	IK10
ONVIF	✓	✓	✓	✓	✓
Profile S	✓	✓	✓	✓	✓
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IP Cameras

	IP Cameras					
	VPort P16-1MP-M12	VPort P16-2MR Series	VPort P16-1MP-M12-IR	VPort 06-2 Series	VPort P06-1MP-M12 Series	VPort P06HC-1MP-M12 Series
Video Performance						
Resolution (max.)	1280 x 800	1920 x 1080	1280 x 800	1920 x 1080	1280 x 800	1280 x 800
FPS (max.)	30	30	30	30	30	30
Connections (max.)	5 unicast 50 mulitcast RTSP	5 unicast 50 multicast RTSP	5 unicast 50 multicast RTSP	5 unicast 50 multicast RTSP	3 unicast 5 mulitcast RTSP	5 unicast 50 mulitcast RTSP
Video Stream						
H.264	✓	✓	✓	✓	✓	✓
MJPEG	✓	✓	✓	✓	✓	✓
No. of Streams	3	4	3	4	3	3
DynaStream™	✓	✓	✓	✓	✓	✓
CBR Pro™	✓	✓	✓	✓	✓	✓
Image Stabilizer	–	–	–	–	–	–
Camera						
Image Sensor	1/2.7" CMOS	1/3" CMOS	1/2.7" CMOS	1/3" CMOS	1/2.7" CMOS	1/2.7" CMOS
Lens (mm)	3.6, 6.0	3.6, 4.2, 6.0, 8.0	3.6, 8.0	2.5, 3.6, 4.2, 6.0, 8.0	2.5, 3.6, 4.2, 6.0, 8.0	3.6
Day & Night	✓	✓	✓	–	–	–
Minimum Illumination	0.2 Lux @ F1.2, color 0.05 Lux @ F1.2, B/W	0.2 Lux @ F1.2, color 0.05 Lux @ F1.2, B/W	0.2 Lux @ F1.2, color 0.05 Lux @ F1.2, B/W	0.2 Lux @ F1.2, color	0.2 Lux @ F1.2, color	0.2 Lux @ F1.2, color
White Balance	ATW/AWB	ATW/AWB	ATW/AWB	ATW/AWB	ATW/AWB	ATW/AWB
Electronic Shutter (sec)	Auto (1/30 to 1/25000)	Auto (1/30 to 1/25000)	Auto (1/30 to 1/25000)	Auto (1/30 to 1/25000)	Auto (1/30 to 1/25000)	Auto (1/30 to 1/25000)
Sense up	–	✓	✓	✓	–	–
AGC Control	✓	✓	✓	✓	✓	✓
Wide Dynamic Range	✓	✓	✓	✓	✓	✓
Back Light Compensation	–	–	–	–	–	–
Auto Exposure	✓	✓	✓	✓	✓	✓
Image Rotation	Flip, mirror, 180° rotation	Flip, Mirror, 90°, 180°, 270° rotation	Flip, Mirror, 90°, 180°, 270° rotation	Flip, Mirror, 90°, 180°, 270° rotation	Flip, mirror, 180° rotation	Flip, mirror, 180° rotation
Digital noise reduction	✓	✓	✓	✓	✓	✓
Network Connections						
10/100 Mbps, M12 Connector	1	1	1	1	1	1
10/100 Mbps, RJ45 Connector	–	–	–	–	–	–
100 Mbps Fiber Connector	–	–	–	–	–	–
Peripherals						
Audio	–	1 built-in microphone	1 built-in microphone	1 line-in or mic-in	1 line-in or mic-in	1 mic-in
DI/Relay	–	1 DI	1 DI	1 DI	–	1 DI
SD Slot	–	✓	✓	✓	–	–
Network Management and Control						
Web Browser	✓	✓	✓	✓	✓	✓
SNMP Protocols	v1/v2c/v3	v1/v2c/v3	v1/v2c/v3	v1/v2c/v3	v1/v2c/v3	v1/v2c/v3
RTSP (Real Time Streaming Protocol)	✓	✓	✓	✓	✓	✓
Multicast (IGMP)	v3	v3	v3	v3	v3	v3
QoS	✓	✓	✓	✓	✓	✓
Automatic Configuration	DHCP Opt 66/67	DHCP Opt 66/67	DHCP Opt 66/67	DHCP Opt 66/67	DHCP Opt 66/67	DHCP Opt 66/67
Form Factor						
Protection Rating	IP66	IP66	IP66	IP66	IP66	IP66
Surface/Ceiling Mounting	✓	✓	✓	✓	✓	–
Flush Mounting	✓	✓	✓	✓	✓	✓
Outdoor Installation Accessory	–	–	–	–	–	–
Power Requirements						
Power-over-Ethernet (PoE)	✓	✓	✓	✓	✓	✓
12/24 VDC, 24 VAC	–	–	–	✓	–	–
Alarms						
VMD (Video Motion Detection)	✓	✓	✓	✓	✓	✓
Alarm Snapshot Image	✓	✓	✓	✓	✓	✓
Tamper Alarm	✓	✓	✓	✓	✓	✓
Supported Operating Temperature Ranges						
Standard Models	-25 to 55°C (-13 to 131°F)					
Wide Temp. Models	-40 to 70°C (-40 to 158°F)					–
Regulatory Approvals						
CE/FCC	✓	✓	✓	✓	✓	✓
UL 60950-1	✓	✓	✓	✓	✓	✓
EN 50155:2007	✓	✓	✓	✓	✓	✓
EN 50121-3-2	✓	✓	✓	✓	✓	✓
EN 50121-4	–	–	–	–	–	–
NEMA TS2	–	–	–	–	–	–
Class 1 Division 2 / Atex Zone 2	–	–	–	–	–	–
EN 62262	IK10	IK8	IK10	IK8	IK9	–
ONVIF	✓	✓	✓	✓	✓	✓
Profile S	✓	✓	✓	✓	✓	✓
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Industrial Video Encoders/Recorders

	Industrial Video Encoders	
	VPort 461A	VPort 364A
Form Factor		
Protection Rating	IP30	IP30
DIN-Rail Mounting	✓	✓
Panel Mounting	w/ optional kit	w/ optional kit
Audio/Video Channels		
Video Inputs	1	4
Video Outputs	0	0
Audio Inputs	1	1
Audio Outputs	1	1
Video Stream		
H.264	✓	✓
MJPEG	✓	✓
MPEG4	–	–
No. of Streams	3	2
DynaStream	✓	✓
Video Performance		
Resolution (max.)	NTSC: 720 x 480 PAL: 720 x 576	NTSC: 720 x 480 PAL: 720 x 576
FPS (max.)	NTSC: 30 PAL: 25	NTSC: 30 PAL: 25
Quad View	30 FPS (max.)	30 FPS (max.)
Connections (Max.)	10 unitcast 50 mulitcast RTSP	8 unitcast 50 mulitcast RTSP
Multicast Push	✓	✓
Network Connections		
10/100BaseTX Ports	1	1
100BaseFX Ports (optional)	1	1
Peripherals		
PTZ Ports	1	1
COM Ports	1	–
RS-232 Console Ports	1	1
SDHC Slot	1, SDXC	–
Network Management and Control		
Web Browser	✓	✓
SNMP Protocols	v1/v2c/v3	v1/v2c/v3
RTSP (Real Time Streaming Protocol)	✓	✓
Modbus/TCP	✓	✓
Multicast (IGMP)	v3	v3
QoS	✓	✓
UPnP	✓	✓
DDNS	✓	✓
IP Filtering	✓	✓
Power Requirements		
Power Redundancy	✓	✓
Power Inputs	2	2
Alarms		
VMD (Video Motion Detection)	✓	✓
Digital Inputs	2	4
Relay (Digital) Outputs	2	2
Alarm Video Recording	✓	–
Alarm Snapshot Image	✓	✓
Supported Operating Temperature Ranges		
0 to 60°C (32 to 140°F)	–	✓
-25 to 60°C (-13 to 140°F)	✓	–
-40 to 75°C (-40 to 167°F)	✓	✓
Standards and Certifications		
CE/FCC	✓	✓
UL 60950-1	✓	✓
NEMA TS2	✓	–
ONVIF	✓	✓
Profile S	✓	–
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	Industrial Video Recorders
	Preliminary
	MxNVR-RO-T
Form Factor	
Type of Product	Onboard NVR
Dimensions	287 x 290 x 101 mm
Panel Mounting	✓
Video Recording	
Video Inputs	IP Video via Ethernet
Capability	Recording: 900 FPS @ 1080P Live view: 120 FPS @ 1080P
Video Stream	H.264, MJPEG, MPEG4
Video File Format	MP4
Record Modes	Manual, Schedule, Event
Pre-Alarm Record	1 to 600 sec
Post-Alarm Record	1 to 600 sec
Search	
Search Mode	Camera, date/time, event
Playback	
Remote Playback	Through Configuration Tool
File Download	Through Configuration Tool
Popular Media Players	✓
Network Connections	
10/100/1000 Mbps M12 connector	1 (up to 1000 Mbps, M12 X-coded)
Storage	
SATA Interfaces	2
Peripherals	
Audio Ports	Line-in, line-out (M12)
COM Ports	2
USB Ports	2
Digital Inputs	6
Digital Outputs	2
Power Requirements	–
Power Inputs	1
Supported Operating Temperature Ranges	
Wide Temp. Model	-40 to 70°C (-40 to 167°C)
Regulatory Approvals	
CE/FCC	✓
UL 60950-1	✓
EN 50155:2007	✓
EN 50121-3-2	✓
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Introduction to Rugged IP Video Surveillance

Committed to the Reliability and Quality of Moxa's IP Cameras

Moxa has been a player in the industrial automation field for over 25 years, and one of the most important lessons we've learned during this time is how critical it is to provide reliable, high quality products to ensure safety. Our commitment to reliability and quality is built into our IP cameras, since we take strict measures at each phase of product development, from selecting materials to conducting a complete product inspection. Our IP cameras are designed to work reliably in harsh, industrial environments, where security and safety are top priorities. When accidents occur, operators need to react as quickly as possible to maximize safety and minimize damage.

At Moxa, we only make the highest quality, industrial-grade IP cameras that meet our customers' critical requirements for operating in harsh environments.

Creating a Consistent Rugged Design

Moxa's entire IP camera line is produced with the same consistent rugged design and quality:

- We select only the highest quality, industrial-grade materials and components for our IP cameras
- Our expertise in thermal design ensures reliable operation in extreme temperatures, -40 to 75°C
- Our rugged cameras are water and dust-proof, vandal-resistant, and protect against shock and vibration

Designed for Optimal Image Quality

Regardless of the environment, Moxa's IP cameras produce the same high quality images with crystal clear details. Our cameras undergo several consecutive hours of testing in outdoor, onboard, and day-and-night conditions to simulate real-world environments:

- EN 50132-7 compliant image quality
- DNR, WDR, and BLC for image optimization
- Auto-iris lens and IR for day and night visibility

Day & Night Image Quality

Strict Industrial-Strength Testing

Moxa's IP cameras undergo strict industrial-strength testing to guarantee a rugged design and top quality:

- Key component cyclic burn-in test includes 20+ days of testing for the lens and 200+ hours of testing for the IP camera motor in a chamber at -45 to 85°C.
- 40+ hours of cyclic wide-temperature testing and burn-in
- Shock and vibration tests simulating rolling stock conditions that comply with IEC 61373*.
- Our cameras are IP66-rated and IK8/10-compliant (EN62262).

*Cyclic burn-in duration/temperature/shock/vibration/IK-rating varies, depending on the IP camera's specs and warranty. See product specs for details.

IP66 water-proof test

IK10 vandal resistant test

100% Product and Quality Inspection

All Moxa IP cameras undergo strict inspections to ensure product quality:

- All camera functions are tested, including the light sensor, light and dark spots, and color calibration.
- Our cameras undergo chambered burn-in for 6 to 40 hours, at temperatures ranging from 60 to 75°C.
- After burn-in, all IP camera functionality is re-tested to ensure that the cameras are IP66 dust and water-proof.

Color Calibration Test

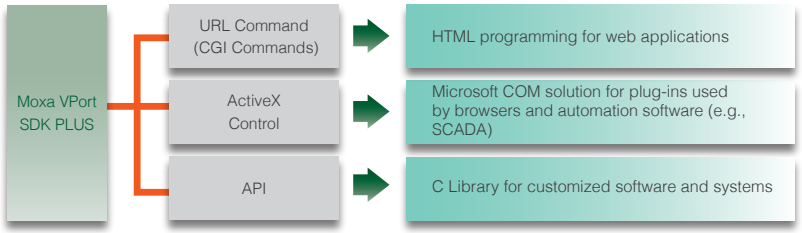
ONVIF Standard Supported

ONVIF is an open industry forum for the development of a global standard for the interface of IP-based physical security products. The ONVIF specification ensures interoperability between products, regardless of manufacturer. Moxa is an ONVIF user member, and most VPort IP video products support ONVIF specifications for simpler and faster integration with ONVIF-compatible third-party software.

User-Friendly VPort SDK PLUS for Third Party Software Developers

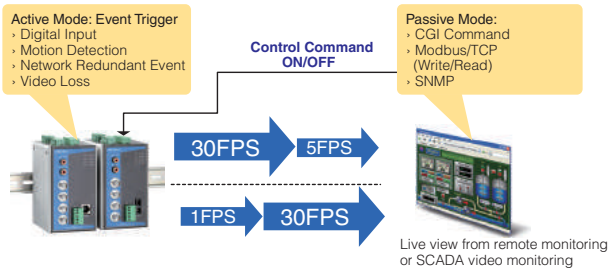
VPort SDK PLUS is a user-friendly SDK (software development kit) that adds VPort video streams to any type of third-party software, such as NVR, VMS, and SCADA. For wide compatibility, the SDK supports three major technologies:

- **CGI commands:** These URL commands are used in HTML and web systems, which are very popular platforms for video surveillance software.
- **ActiveX Control SDK:** ActiveX Control is an OCX component that is used widely in platforms that support WIN32, IE Plug-in, and Visual Basic, and is also popular in automation system software, such as SCADA systems. Moxa ActiveX Control SDK PLUS is a user-friendly, customized tool for programmers that supports versatile parameters for customized viewing, recording, PTZ camera control, event triggering, and recorded video playback.
- **API SDK:** The API SDK, which includes a detailed C library, can be used to program customized solutions in a Visual C++ or C# environment. The API SDK includes a total of 4 DLL modules, and currently supports the WIN32, Linux, and WIN CE pocket 2003 platforms.



DynaStream™ for System and Network Efficiency

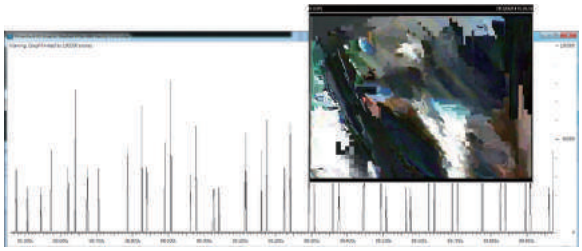
With hundreds of cameras in an integrated system with IP surveillance and other systems (such as SCADA), it is important to control the size of a video stream so that it does not flood over to the common shared network and consume too many system resources, which could disrupt critical system operation or data transmission. Moxa has developed a revolutionary DynaStream™ function, which can control the video frame rate, and has introduced it into all VPort series products automatically. Once an event is detected, such as a DI alarm, network traffic jam, etc., the system can automatically reduce all VPort video frame rates so that they will consume fewer resources and less bandwidth, or increase all VPort video frame rates to increase video performance. This is done with CGI commands, SNMP, or Modbus/TCP. This new tool is extremely flexible. Not only can it change system resources and network bandwidth so that critical data systems can maintain Quality of Service (QoS), but it can also guarantee that system performance will not be impacted by video streams.



CBR Pro™ for Excellent Image Quality with Limited Bandwidth

CBR Pro™ is an advanced bit rate flow control technology that limits the transmission bit rate based on a user's network bandwidth. This function is designed to secure the video stream transmission to provide better image quality by eliminating the dropped packets that occur when the peak bit rate exceeds the bit rate allowed by the network bandwidth.

- Eliminate image packet loss
- Increase network efficiency
- Available with all Moxa IP cameras



CBR only

CBR Pro™

VPort 66-2MP Series

1080P PTZ dome IP camera for outdoors

- -40 to 65°C operating temperature
- Maximum 1920x1080 resolution at 60 FPS (single stream)
- Supports 360° endless PAN and -6° to +96° TILT
- 22X/30X optical zoom, and 20X digital zoom
- DNR, BLC, and image stabilizer for superb image quality
- Built-in 4.3 to 94.6 mm (22X) or 4.3 to 129 mm (30X) focal length lens with ICR (IR-cut filter removable)
- Triple video streams with H.264 and MJPEG
- IP66 rain and dust protection and NEMA Type 4X form factor
- NEMA TS2 compliance and NTCIP 1205 support for ITS system
- Calibrate PTZ movement manually or by schedule
- Smart PTZ tracking (Pending)

DynaStream ONVIF NEMA TS2 EN 50121 FC CE c UL us LISTED

Introduction

The VPort 66-2MP is an IK10, IP66-rated, PTZ speed dome IP camera for use in harsh, outdoor environments. With a 360° endless PAN, -6 to 96° TILT, 22X/30X optical zoom, 20X digital zoom, H.264/MJPEG triple video streams, and day-and-night camera lens, the VPort 66-2MP is especially well-suited for outdoor video surveillance applications. In addition, the VPort 66-2MP supports NTCIP 1205, which is an ITS (intelligent transportation system) communication protocol standard. NTCIP support allows the user to control PTZ operation directly via the NTCIP-compliant control panel.

Specifications

Camera

Sensor: 1/2.8" HD progressive scan CMOS
Lens:
22X: f=4.3 mm (wide) to 94.6 mm (tele), F1.6 to F4.5
• Horizontal angle of view: 65.1° to 3.1°
• Vertical angle of view: 38.4° to 1.8°
30X: f=4.3 mm (wide) to 129.0 mm (tele), F1.6 to F4.7
• Horizontal angle of view: 65.1° to 2.3°
• Vertical angle of view: 38.4° to 1.4°
Minimum Illumination:
• Color: 0.4 lux, at F1.6 (Gain High, 50 IRE, 1/30 sec)
• B/W: 0.03 lux, at F1.6 (Gain High, 50 IRE, 1/30 sec)
Minimum Working Distance: 10 cm (wide), 120 cm (tele)
Day & Night: Auto/Color/BW; ICR control
Synchronization: Internal
White Balance: ATW/AWB
Electronic Shutter: Auto, Fixed (1/100 to 1/16000 sec)
S/N Ratio: Over 50 dB (AGC OFF; DNR on)
ICR Control: Auto
DNR: Built-in 2D/3D DNR (digital noise reduction)
Auto Focus: Continuous, one-shot
AGC (auto gain control): Off, Level 1 to 7
BLC (back light compensation): Off, Level 1 to 15
Sense Up: On/Off, maximum 128X
IRIS: Auto/Manual IRIS control, Electronic IRIS
Electronic Image Stabilizer: Low, Medium, High
WDR: 50 db
Flickerless Control: On/Off
Image Rotation: Flip, Mirror, and 180° rotation
Image Setting: Manual tuning with sharpness

Video

Video Compression: H.264 (ISO/IEC 14496-10) or MJPEG
Video Output: via Ethernet
Video Streams: 3 independent H.264 or MJPEG video streams
Video Resolution and FPS (frames per second):

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
QVGA	320 x 240	30	320 x 240	25
CIF	352 x 240	30	352 x 288	25
VGA	640 x 480	30	640 x 480	25
4CIF	704 x 480	30	704 x 576	25
Full D1	720 x 480	30	720 x 576	25
SVGA	800 x 600	30	800 x 600	25
HD	1280 x 720	30	1280 x 720	25
WXGA	1280 x 800	30	1280 x 800	25
SXGA	1280 x 1024	30	1280 x 1024	25
Full HD	1920 x 1080	30	1920 x 1080	25

Note: Single video stream supports up to 60 FPS.

Video Viewing:
• DynaStream™ support for changing the video frame rate automatically
• Adjustable image size and quality
• Timestamp and text overlay
• Maximum of 5 simultaneous unicast connections, 50 multicast clients
• CBR Pro™ support for accurate streaming bit rate control

Audio

Audio Inputs: 1, line-in, with 2-pin terminal block connector
Audio Outputs: 1, line-out, with 2-pin terminal block connector
Audio Format: Mono, PCM (G.711); AAC

Network

Protocols: IPv4/v6,TCP, NTCIP 1205, UDP, HTTP, SMTP, FTP, Telnet, NTP, DNS, DHCP, TFTP, UPnP, RTP, RTSP, ICMP, IGMPv3, ARP, QoS, SNMPv1/v2c/v3, DDNS, Modbus/TCP, 802.1X, SSH/HTTPS, OPT66/67
Ethernet: 1 10/100BaseT(X) Ethernet port, RJ45 connector

Local Storage

SD Socket: Standard SD socket (SDHC)

GPIO

Digital Inputs: 1, max. 8 mA
• High: +13 to +30 V
• Low: -30 to +3 V
Relay Output: 1, max. 24 VDC @ 1 A

Power Requirements

Input Voltage: 24 VDC, 24 VAC
Input Current: 2.925 A @ 24 VDC; 4.94 A @ 24 VAC
Power Consumption:
• 27 watts when heater and fan are off
• 31 watts when fan is on and heater is off
• 71 watts when fan and heater are on

Physical Characteristics

Housing:
• IP66-rated rain and dust protection connector
• EN 62262 IK10 vandal-resistant support
• NEMA Type 4X
• Metal housing, PC dome cover
Weight: 5.15 kg (11.33 lb)
Installation: Outdoor mounting with optional accessories

Alarms

Video Motion Detection: Includes sensitivity tuning
Scheduling: Daily repeat timing schedule
Imaging: JPEG snapshots for pre/trigger/post alarm images
Custom Alarms: HTTP event servers and CGI events for setting customized alarm actions
Email/FTP Messaging: Automatic transfer of stored images via email or FTP with event-triggered actions
Pre-alarm Buffer: 35 MB for JPEG snapshot images

PAN/TILT/ZOOM

Pan Range: 360° endless, manual control speed from 0.15°/s to 120°/s
Tilt Range: -6° to + 96°, manual control speed from 0.15°/s to 120°/s
TILT Capability: 6° above the horizon
Optical Zoom: 22X, 30X
Digital Zoom: 20X
Preset Positions: 128 presets
• Preset moving speed: from 1°/s to 255°/s
• Alarm trigger moving speed: 360°/s
Functionality: Supports guard tours

Security

Password: User level password protection
Filtering: By IP address
Authentication: 802.1X
Encryption: HTTPS, SSH

Environmental Limits

Operating Temperature: -40 to 65°C (-40 to 149°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Vibration:
IEC 60068-2-6, 2 to 13.2 Hz: 2 mm (peak-peak); 13.2 to 100 Hz: 0.7g; 1.50 hrs/axis
IEC 60068-2-6, 3 to 9 Hz: 7 mm (peak-peak); 9 to 150 Hz: 1.0g; 1.86 hrs/axis
Shock: IEC 60068-2-27*, 20g/11ms
Altitude: 2000 m
Ingress Protection: IEC 60529, IP66
Salt Spray Test: ASTM-B117
This unit can pass the test criteria without being damaged, but if the camera is repositioned, PAN/TILT calibration needs to be redone.

Standards and Certifications

Safety: UL 60950-1
Rail Traffic: EN 50121-4
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: Signal: 2 kV
IEC 61000-4-8
Transportation: NEMA TS2 compliant

MTBF (mean time between failures)

Time: 525,491 hrs
Standard: Telcordia SR332

Warranty

Warranty Period: 3 years (limited warranty on moving parts; see Moxa's online warranty policy for details)
Details: See www.moxa.com/warranty

Minimum Viewing System Requirements

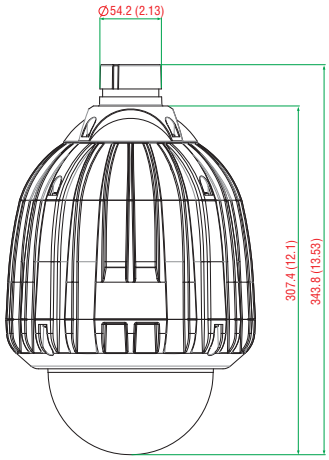
CPU: Pentium 4, 2.4 GHz
Memory: 512 MB of memory
OS: Windows XP/2000 with SP4 or above
Browser: Internet Explorer 6.x or above
Multimedia: DirectX 9.0c or above

Software Development

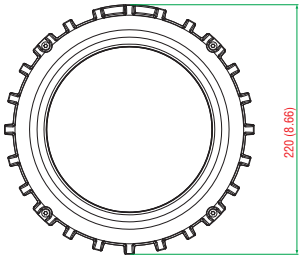
VPort SDK PLUS: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (latest version available on Moxa website).
Standard: ONVIF, Profile S

Dimensions

Unit: mm (inch)



Side Views



Bottom View

Ordering Information

Available Models

VPort 66-2MP-CAM22X: 1080P PTZ dome IP camera, 22X optical zoom, RJ45 Ethernet port, 24 VAC/ VDC, -40 to 65°C
VPort 66-2MP-CAM30X: 1080P PTZ dome IP camera, 30X optical zoom, RJ45 Ethernet port, 24 VAC/ VDC, -40 to 65°C

Optional Accessories (can be purchased separately)

VP-520LB: Wall-mounting kit, 204(W) x 284(H) x 255(D) mm
VP-520HB: Pendant-mounting kit, 284(L) x 204(W) x 149.5(H) mm
VP-510CPM: Pole-mounting kit for the VP-520LB, 275(W) x 91(H) x 182(D) mm
VP-SH1: Sunshield for the VPort 66-2MP, 236(Ø) x 180(H) mm
SoftNVR-IA: 64-channel IP surveillance software for industrial automation applications
DR-75-24/120-24: 75/120 W DIN rail 24 VDC power supplies
MDR-60-24: 60 W DIN rail 24 VDC power supplies, -20 to 70°C operating temperature

Package Checklist

- VPort 66-2MP series IP camera
- 3.5 mm jack to 2-pin terminal block connector
- L-type Torx screwdriver
- Dry pack and hook fastner
- Quick installation guide (printed)
- Documentation and software CD
- Warranty card

▶ *Award-winning Product*

VPort 56-2MP Series

1080P, rugged, day-and-night zoom IP cameras

- -40 to 75°C operating temperature (fan not required)
- Maximum 1920x1080 resolution at 30 FPS
- 10x optical zoom and 16x digital zoom
- 3D DNR, BLC, and image stabilizer for superb image quality
- Triple video streams with H.264 and MJPEG
- Optional model with built-in single mode fiber
- Two-way and full duplex audio input/output
- DynaStream™ and CBR Pro™ support for network efficiency
- SD card interface for disconnection and event recording

Introduction

The VPort 56-2MP series includes the world's first rugged IP zoom cameras that can survive in extreme temperatures ranging from -40 to 75°C (T models), without a built-in or external fan. Models with a 0 to 60°C operating temperature range are also available. The VPort 56-2MP cameras are industrial-grade 1080P resolution (1920 x 1080) H.264 IP box cameras designed for mission critical environments.

With advanced optical technology featuring 10x optical and 16x digital zoom, the cameras greatly improve the efficiency of your surveillance work and ensure the best video quality. With optional housing and PT scanner accessories available, the VPort 56-2MP series is suitable for virtually any kind of indoor or outdoor installation.

Specifications

Camera

Sensor: 1/2.5" HD progressive scan CMOS
Lens: 10X: f=6.3 mm (wide) to 63 mm (tele), F1.8 to F2.5
• Horizontal angle of view: 50.6° to 5.5°
• Vertical angle of view: 39.3° to 3.1°
• Diagonal angle of view: 57° to 26.2°
Illumination:
• Color: 2.0 lx (1/30 sec, 50 IRE, F1.8, Gain: High)
• B/W: 0.1 lx (1/30 sec, 50 IRE, F1.8, Gain: High)
Day & Night: Color/BW; ICR Control
Synchronization: Internal
White Balance: ATW/AWB
Electronic Shutter: Auto, Fixed (1/50 to 1/10000 sec)
S/N Ratio: More than 50 dB (AGC off)
ICR Control: Auto (light sensor control) or DI control
DNR: Built-in 3D DNR (digital noise reduction)
Auto Focus: Continuous
AGC (auto gain control): Off, Levels 1 to 7
BLC (back light compensation): Off, Levels 1 to 15
Sense Up: on/off, maximum 64X
IRIS: Auto/Manual IRIS control, Electronic IRIS
Electronic Image Stabilizer: Low, Medium, High
Flickerless Control: On/Off
Image Rotation: Flip, Mirror, and 180° rotation
Image Setting: Manually tune sharpness

Video

Video Compression: H.264 (ISO/IEC 14496-10) or MJPEG
Video Output: via Ethernet
Video Streams: 3 independent H.264 or MJPEG video streams

Video Resolution and FPS (frames per second):

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
CIF	352 x 240	30	352 x 288	25
VGA	640 x 480	30	640 x 480	25
4CIF	704 x 480	30	704 x 576	25
Full D1	720 x 480	30	720 x 576	25
SVGA	800 x 600	30	800 x 600	25
HD	1280 x 720	30	1280 x 720	25
Full HD	1920 x 1080	30	1920 x 1080	25

Note: Up to 30/25 FPS for each of 3 independent streams at max resolution.

Video Viewing:
• DynaStream™ support for changing the video frame rate automatically
• CBR Pro™ support for accurate streaming bit rate control
• 8 privacy mask areas provided
• Adjustable image size and quality
• Timestamp and text overlay
• Maximum of 5 simultaneous unicast connections, 50 multicast clients
• ROI (Region of Interest) configuration for up to 3 areas

Audio

Audio Inputs: 1 Line-in with 3.5 mm phone jack
Audio Outputs: 1 Line-out with 3.5 mm phone jack
Audio Format: Mono, PCM (G.711)

Network

Protocols: TCP, UDP, HTTP, SMTP, FTP, Telnet, NTP, DNS, DHCP, UPnP, RTP, RTSP, ICMP, IGMPv3, QoS, SNMPv1/v2c/v3, DDNS, Modbus/TCP, 802.1X, SSH/HTTPS
Ethernet: 1 10/100BaseT(X) Ethernet port, RJ45 connector, or 1 100BaseFX, single mode

Serial Port

PTZ Ports: 1, RS-485, terminal block connector

Local Storage
SD Socket: Standard SD socket (SDHC, SDXC)

GPIO
Digital Inputs: 1, max. 8 mA
• High: +13 to +30 V
• Low: -30 to +3 V
Relay Output: 1, max. 24 VDC @ 1 A

LED Indicators
STAT: Indicates if the system is booted properly or not
Network: 10 Mbps or 100 Mbps
Power: Power on/off

Power Requirements
Input Voltage: 24V DC (12 to 24 VDC) / 24 VAC, and PoE+ (802.3at) redundant power design
Input Current: 12 to 24 VDC, 2.548 to 0.975 A, or 24 VAC, 21.97 W, or 48 VDC (PoE), 0.494 A
Power Consumption: 23 W (max.)

Physical Characteristics
Housing: Metal, IP30 protection
Dimensions: 90 x 60.92 x 216.1 mm (3.54 x 2.72 x 8.51 in)
Weight: 1.415 kg (3.2 lb)
Installation: Wall mounting, ceiling mounting, pole mounting, corner mounting
Note: Optional external housing and mounting accessories may be required.

Alarms
Intelligent Video: Camera tamper
Video Motion Detection: 3 independently configurable areas; includes sensitivity tuning
Scheduling: Daily repeat timing schedule
Imaging: JPEG snapshots for pre/trigger/post alarm images
Custom Alarms: HTTP event and CGI events for setting customized alarm actions
Email/FTP Messaging: Automatic transfer of stored images via email or FTP as event-triggered actions
Pre-alarm Buffer: 84 MB video buffer for JPEG snapshot images

PAN/TILT/ZOOM
Optical Zoom: 10X
Digital Zoom: 16X

Environmental Limits
Operating Temperature:
Standard Models: -25 to 60°C (-13 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Vibration:
IEC 60068-2-6, 2 to 13.2 Hz: 2 mm (peak-peak); 13.2 to 100 Hz: 0.7g; 1.50 hrs/axis
IEC 60068-2-6, 3 to 9 Hz: 7 mm (peak-peak); 9 to 150 Hz: 1.0g; 1.86 hrs/axis
Shock: IEC 60068-2-27, 20g/11ms
Altitude: 2000 m

Standards and Certifications
Safety: UL60950-1, EN 50121-4, NEMA TS2
Rail Traffic: EN 50121-4
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal; 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8

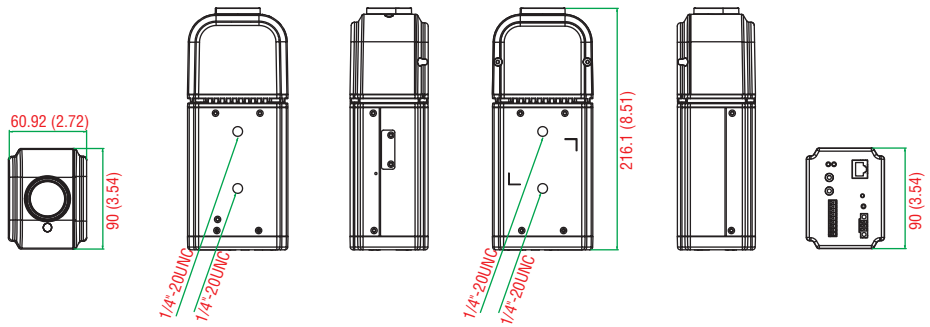
MTBF (mean time between failures)
Time: 169,886 hours
Standard: Telcordia (Bellcore), GB 25°C

Warranty
Warranty Period: 3 years (limited warranty on moving parts; see Moxa's online warranty policy for details)
Details: See www.moxa.com/warranty

Software Development
VPort SDK PLUS: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (latest version available on Moxa website).
Standard: ONVIF Profile S

Dimensions

Unit: mm (inch)



Front View | Side Views | Rear View

Ordering Information

Available Models
VPort 56-2MP-CAM10X: Full HD zoom IP camera, RJ45 Ethernet port, 12/24 VDC or 24 VAC or PoE+, -25 to 60°C operating temperature
VPort 56-2MP-CAM10X-T: Full HD zoom IP camera, RJ45 Ethernet port, 12/24 VDC or 24 VAC or PoE+, -40 to 75°C operating temperature
VPort 56-2MP-CAM10X -S-SC: Full HD zoom IP camera, Single-mode fiber Ethernet port, 12/24 VDC or 24 VAC, -25 to 60°C operating temperature
VPort 56-2MP-CAM10X-S-SC-T: Full HD zoom IP camera, Single-mode fiber Ethernet port, 12/24 VDC or 24 VAC, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)
VP-CI701: IP68-rated outdoor housing, 406(L) x 109(H) x 145 (W) mm
VP-CI800: Wall-mounting bracket for outdoor housing, 213 (L) x 146 (H) x 80(W) mm
VP-CI815: Pole-mounting bracket for Ø70 to Ø230 mm pole
VP-CI820: Pole-mounting bracket for Ø360 mm pole
SoftNVR-IA: 64-channel IP surveillance software for industrial automation applications
DR-4524/75-24/120-24: 45/75/120 W DIN-rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN rail 24 VDC power supplies, -20 to 70°C operating temperature

Package Checklist
- VPort 56-2MP series IP camera
- 9-pin terminal block for RS-485, DI/Relays
- 3-pin terminal block for power input
- Quick installation guide (printed)
- Documentation and software CD
- Warranty card

VPort 36-2L Series

Preliminary

1080P, day-and-night, rugged box IP cameras

- Industrial design with -40 to 75°C operating temperature (heater or cooling fan not required)
- Maximum 1920 x 1080 resolution at 30 FPS
- Built-in P-IRIS zoom lens with 3x (3 to 9 mm) and 2x (10 to 23 mm) optical zoom
- Zoom and focus can be controlled remotely over an IP network
- Four video streams with H.264 and MJPEG
- SD card interface for disconnection and event recording
- 12/24 VDC, 24 VAC, or PoE redundant power inputs
- EN 50121-4, NEMA TS2 compliance

DynaStream ONVIF

c UL us LISTED NEMA TS2 EN 50121 CE FC

Introduction

The VPort 36-2L rugged 1080P (1920 x 1080) box IP cameras are specially designed for mission-critical and extreme weather environments. The cameras have two kinds of built-in P-iris zoom lenses, 3 to 9 mm and 10 to 23 mm. They support remote zoom and focus control via an IP network, providing convenience and simplicity for camera operation, and feature a wide -40 to 75°C operating temperature range (-T models) and industrial-grade EMC (EMI/ Surge Level 3) protection. The VPort 36-2L cameras are suitable for the kind of industrial and outdoor environments found with oil & gas, rail, and ITS applications. In addition, the VPort 36-2L supports a light sensor and ICR (IR-cut filter removable) for day & night viewing, advanced WDR (wide dynamic range), and DNR (digital noise reduction), allowing the VPort 36-2L to produce good quality images even in extreme sunlight conditions.

Specifications

Camera

Sensor: 1/3" progressive scan CMOS
Lens:
3X: f=3(wide) to 9 (tele) mm, F1.6 to F2.6
• Horizontal angle of view: 38.1° to 121.2°
• Vertical angle of view: 21.3° to 62.1°
• Diagonal angle of view: 43.8° to 148.4°
2X: f=10 (wide) to 23 (tele) mm, F1.2 to F2.3
• Horizontal angle of view: 14.8° to 33.7°
• Vertical angle of view: 8.3° to 18.3°
• Diagonal angle of view: 17.1° to 39.1°
Illumination (low light sensitvity):
Color: 0.2 Lux @ F1.2
B/W: 0.05 Lux @ F1.2
Day & Night: Auto/Color/BW; ICR Control
Synchronization: Internal
White Balance: ATW/AWB
Electronic Shutter: Auto, Fixed (1/30 to 1/25000 sec)
S/N Ratio: 50 dB (AGC, OFF; DNR ON)
ICR Control: Auto (light sensor control) or DI control
DNR: Built-in DNR (digital noise reduction)
AGC (auto gain control): 2X, 4X, 8X, 16X
IRIS: Auto, P-IRIS
WDR: On/Off, up to 100 dB
Flickerless Control: Automatic, 50 Hz,60 Hz modes
Auto Exposure: Level ±5
Image Rotation: Flip, Mirror, 90°, 270° and 180° rotation
Image Setting: Manual tuning with saturation, sharpness, and contrast

Video

Video Compression: H.264 (ISO/IEC 14496-10) or MJPEG
Video Outputs: Via Ethernet
Video Streams: 4, H.264, or MJPEG independent video streams

Video Resolution and FPS (frames per second):

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
CIF	352 x 240	30	352 x 288	25
VGA	640 x 480	30	640 x 480	25
4CIF	704 x 480	30	704 x 576	25
Full D1	720 x 480	30	720 x 576	25
SVGA	800 x 600	30	800 x 600	25
HD	1280 x 720	30	1280 x 720	25
SXGA	1280 x 1024	30	1280 x 1024	25
Full HD	1920 x 1080	30	1920 x 1080	25

Video Viewing:
• DynaStream™ support for changing the video frame rate automatically
• CBR Pro™ support for accurate streaming bit rate control
• 3 privacy mask areas provided
• Adjustable image size and quality
• Timestamp and text overlay
• Maximum of 5 simultaneous unicast connections, 50 multicast clients

Audio

Audio Inputs: 1, 3.5 mm phone jack
Audio Outputs: 1, 3.5 mm phone jack
Audio Format: Mono, PCM (G.711); AAC

Network

Protocols: IPv4/v6,TCP, UDP, HTTP, SMTP, FTP, NTP, DNS, DHCP, TFTP, UPnP, RTP, RTSP, ICMP, IGMPv3, ARP, QoS, SNMPv1/v2c/v3, DDNS, Modbus/TCP, 802.1X, SSH/HTTPS, OPT66/67
Ethernet: 1 10/100BaseT(X) Ethernet port, RJ45 connector

Serial Port

PTZ Ports: 1, RS-485, terminal block connector
PTZ Driver: Pelco D, Pelco P, custom camera

Local Storage
SD Socket: Standard SD socket (SDXC, SDHC)

GPIO
Digital Inputs: 1, max. 8 mA,
• High: +13 V to +30 V
• Low: -30 V to +3 V
Relay Output: 1, max. 24 VDC @ 1 A

LED Indicators
STAT: Indicates if the system is booted properly or not
Network: 10 Mbps or 100 Mbps
Power: Power on/off

Power Requirements
Input Voltage: 12/24 VDC, 24 VAC or Power-over-Ethernet redundant power design

Physical Characteristics
Housing: Metal, IP30 protection
Dimensions: 203 x 91 x 70 mm (8 x 3.6 x 2.8 in)
Installation: Wall mounting, pole mounting, corner mounting
Note: Optional external housing and mounting accessories may be required.

Alarms
Intelligent Video: Camera tamper
Video Motion Detection: 3 independently configurable motion areas
Scheduling: Daily repeat timing schedule
Imaging: JPEG snapshots for pre/trigger/post alarm images
Video Recording: Event/always recordings stored on the SD card
Custom Alarms: HTTP event servers for setting customized alarm actions
Email/FTP Messaging: Automatic transfer of stored images via email or FTP as event-triggered actions
Pre-alarm Buffer: 24 MB video buffer for JPEG snapshot images

Security
Password: User level password protection
Filtering: By IP address
Authentication: 802.1X
Encryption: HTTPS, SSH

Environmental Limits
Operating Temperature:
Standard model: -25 to 60°C (-13 to 140°F)
Wide Temp. model: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Vibration:
IEC 60068-2-6, 2 to 13.2 Hz: 2 mm (peak-peak); 13.2 to 100 Hz: 0.7g; 1.50 hrs/axis
IEC 60068-2-6, 3 to 9 Hz: 7 mm (peak-peak); 9 to 150 Hz: 1.0g; 1.86 hrs/axis
Shock: IEC 60068-2-27, 20g/11ms
Altitude: 2000 m

Standards and Certifications
Safety: UL 60950-1
Rail Traffic: EN 50121-4
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: Signal: 2 kV
IEC 61000-4-8
Traffic Control: NEMA TS2

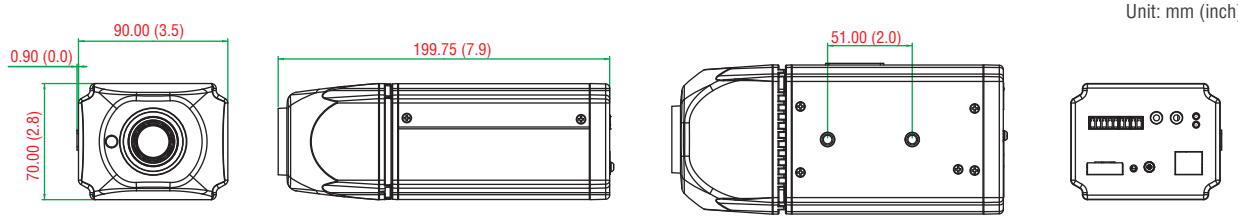
Warranty
Warranty Period: 5 years (limited warranty on moving parts; see Moxa's online warranty policy for details)
Details: See www.moxa.com/warranty

Minimum Viewing System Requirements
CPU: Pentium 4, 2.4 GHz
Memory: 512 MB of memory
OS: Windows XP with SP3 or above, Windows 7
Browser: Internet Explorer 8.x or above
Multimedia: DirectX 9.0c or above

Software Development
VPort SDK PLUS: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (the latest version of SDK is available for download from Moxa's website).
Standard: ONVIF Profile S

Dimensions

Unit: mm (inch)



Ordering Information

Model	Lens		Ethernet		Temperature	
	3 to 9 mm	10 to 23 mm	RJ45	Single-Mode Fiber	-25 to 60°C	-40 to 75°C
VPort 36-2L3X	✓	–	✓	–	✓	–
VPort 36-2L2X	–	✓	✓	–	✓	–
VPort 36-2L3X-T	✓	–	✓	–	–	✓
VPort 36-2L2X-T	–	✓	✓	–	–	✓

Optional Accessories (can be purchased separately)
VP-CI701: IP68 outdoor housing, 406(L) x 109(H) x 145(W) mm
VP-CI800: Wall-mounting bracket for an outdoor housing, 213(L) x 146(H) x 80(W) mm
VP-CI815: Pole-mounting bracket for a Ø70 to Ø230 mm pole
VP-CI820: Pole-mounting bracket for a Ø360 mm pole
SoftNVR-IA: 64-channel IP surveillance software for industrial automation applications
DR-4524/75-24/120-24: 45/75/120 W DIN-rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-rail 24 VDC power supplies, -20 to 70°C operating temperature

Package Checklist
- VPort 36-2L series IP camera
- Quick installation guide (printed)
- Documentation and software CD
- Warranty card

VPort 36-1MP Series

HD, rugged, day-and-night box type IP cameras

- Industrial design with -40 to 75°C operating temperature (heater or cooling fan not required)
- 1/2.7" progressive scan CMOS camera with HD resolution (max. 1280 x 720)
- DNR, WDR for superb image quality
- Triple video streams with H.264 and MJPEG
- Compatible with C/CS-mount lenses with built-in ICR support
- EN 50121-4 and NEMA TS2 compliant
- DynaStream™ support for maximum network efficiency
- Local storage capability with SD card slot

Note: Lens must be purchased separately.

Introduction

Rugged Design

The VPort 36-1MP series includes the world's first rugged IP camera that can operate reliably in temperatures ranging from -40 to 75°C, without a heater or cooling fan.

Superb Video Quality

The VPort 36-1MP series is designed to be compatible with C/CS-mount lenses to meet any viewing angle and distance requirement. With a built-in, removable IR-cut filter and automatic color mode switching, the VPort 36-1MP series is suitable for either day or night use. Highly-tuned ROI (Regions of Interest), and WDR (Wide Dynamic Range) functions enable the VPort 36-1MP series to produce exceptionally clear images.

Convenient Installation

The VPort 36-1MP series includes unique and competitive cameras with features such as high EMI/surge protection, optional IP68 housing for rain/dust protection, and -40 to 75°C operation without a heater or cooling fan. The cameras are available with PoE (Power over Ethernet, 802.3af) or wire power input supporting 12/24 VDC or 24 VAC.

High Video Performance and Network Security

The VPort 36-1MP series can encode analog video into both H.264 and MJPEG video streams and can transmit up to 3 independent video streams (2 in H.264, and 1 in MJPEG) simultaneously. Advanced video encoding technology enables the cameras to support up to 30 FPS for each of the H.264 and MJPEG streams.

Specifications

Camera

Sensor: 1/2.7" HD progressive scan CMOS
Lens: Designed for C/CS-mount lens (lens not included)
Illumination (low light sensitvity):
• Color: 0.2 lux at F1.2
• B/W: 0.05 lux at F1.2
Day & Night: Auto/Color/BW; ICR Control
Synchronization: Internal
White Balance: ATW/AWB
Electronic Shutter: Auto, Fixed (1/30 to 1/25000 sec)
Dynamic Range:
• Color: 100 dB
• B/W: 110 dB
S/N Ratio: 50 dB (AGC OFF; DNR ON)
ICR Control: Auto (light sensor control) or DI control
DNR: Built-in DNR (digital noise reduction)
AGC (auto gain control): 2X, 4X, 8X, 16X, 32X, 64X
IRIS: Auto, DC drive
WDR: Levels 1-8
• color: 100 dB
• B/W: 110 dB
Flickerless Control: Indoor/Outdoor mode
Auto Exposure: Level ±5
Image Rotation: Flip, Mirror, and 180° rotation
Image Setting: Manual tuning with saturation, sharpness, and contrast
Black Level Control: High/Medium/Low

Video

Video Compression: H.264 (ISO/IEC 14496-10) or MJPEG
Video Output: Ethernet
Video Streams: 3, H.264, or MJPEG independent video streams

Video Resolution and FPS (frames per second):

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
QCIF	176 x 112	30	176 x 144	25
QVGA	320 x 240	30	320 x 240	25
CIF	352 x 240	30	352 x 288	25
VGA	640 x 480	30	640 x 480	25
4CIF	704 x 480	30	704 x 576	25
Full D1	720 x 480	30	720 x 576	25
SVGA	800 x 600	30	800 x 600	25
HD	1280 x 720	30	1280 x 720	25
WXGA	1280 x 800	30	1280 x 800	25

Note: Mulitple streams may not support up to 30 FPS.

Video Viewing:
• DynaStream™ support for changing the video frame rate automatically
• 3 privacy mask areas provided
• Adjustable image size and quality
• Timestamp and text overlay
• Maximum of 5 simultaneous unicast connections, 50 multicast clients
• CBR Pro™ support for accurate streaming bit rate control

Network
Protocols: TCP, UDP, HTTP, SMTP, FTP, Telnet, NTP, DNS, DHCP, UPnP, RTP, RTSP, ICMP, IGMPv3, QoS, SNMPv1/v2c/v3, DDNS, Modbus/TCP, 802.1X, SSH/HTTPS
Ethernet: 1 10/100BaseT(X) Ethernet port, RJ45 connector

Serial Port
PTZ Ports: 1, RS-485, terminal block connector

Local Storage
SD Socket: Standard SD socket (SDHC)

GPIO
Digital Inputs: 1, max. 8 mA
High: +13 to +30 V; Low: -30 to +3 V
Relay Output: 1, max. 24 VDC @ 1 A

LED Indicators
STAT: Indicates if the system is booted properly or not
Network: 10 Mbps or 100 Mbps
Power: Power on/off

Power Requirements
Input Voltage: 24 VDC (12 to 24 VDC) / 24 VAC, and PoE (802.3af) redundant power design
Input Current: 12 to 24 VDC, 0.8 A or 24 VAC, 7.5 W or 48 VDC (PoE), 0.135 A

Physical Characteristics
Housing: Metal, IP30 protection
Dimensions:
81.76 x 69.65 x 147.6 mm (3.22 x 2.74 x 147.6 in)
Weight: 770 g (1.69 lb)
Installation: Wall mounting, pole mounting, corner mounting
Note: Optional external housing and mounting accessories may be required.

Alarms
Intelligent Video:
VPort 36-1MP: Camera tamper
VPort 36-1MP-IVA: Camera tamper, detection line/zone, missing object, abandoned object
Note: IVA functions are optional except for camera tamper.
Video Motion Detection: 3 independently configurable areas; includes sensitivity tuning
Scheduling: Daily repeat timing schedule
Imaging: JPEG snapshots for pre/trigger/post alarm images
Video Recording: Event recordings stored on the SD card
Custom Alarms: HTTP event servers for setting customized alarm actions
Email/FTP Messaging: Automatic transfer of stored images via email or FTP as event-triggered actions
Pre-alarm Buffer: 24 MB video buffer for JPEG snapshot images

Security
Password: User level password protection
Filtering: By IP address
Authentication: 802.1X
Encryption: HTTPS, SSH

Environmental Limits
Operating Temperature:
Standard Models: -25 to 60°C (-13 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Vibration:
IEC 60068-2-6, 2 to 13.2 Hz: 2 mm (peak-peak); 13.2 to 100 Hz: 0.7g; 1.50 hrs/axis
IEC 60068-2-6, 3 to 9 Hz: 7 mm (peak-peak); 9 to 150 Hz: 1.0g; 1.86 hrs/axis
Shock: IEC 60068-2-27, 20g/11ms
Altitude: 2000 m

Standards and Certifications
Safety: UL 60950-1
Rail Traffic: EN50121-4
Note: Please check Moxa's website for the most up-to-date certification status.
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nCnAnL IIC T4
Note: The VP-3113MPIR lens is Class I Div. 2 and ATEX Zone 2 certified.
Transportation: NEMA TS2

MTBF (mean time between failures)
Time: 541,826 hours
Standard: Telcordia SR332

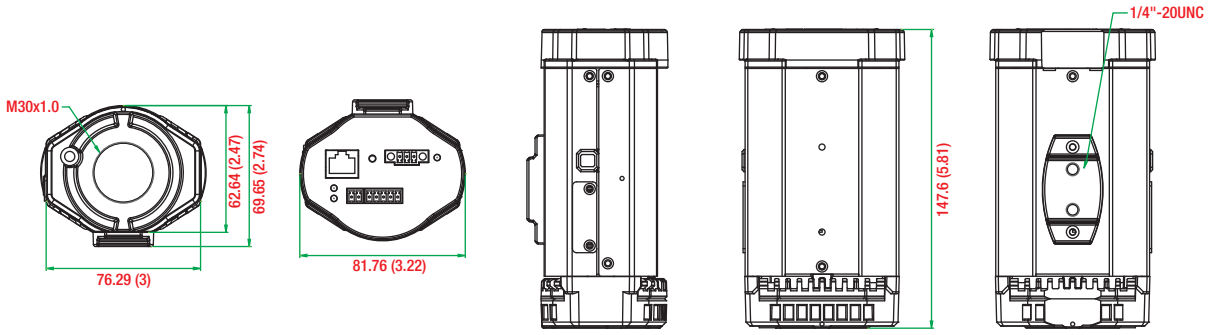
Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Minimum Viewing System Requirements
CPU: Pentium 4, 2.4 GHz
Memory: 512 MB of memory
OS: Windows XP/2000 with SP4 or above, Windows Vista, Windows 7
Browser: Internet Explorer 9.x or above
Multimedia: DirectX 9.0c or above

Software Development
VPort SDK PLUS: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (latest version available on Moxa website).
Standard: ONVIF Profile S

Dimensions

Unit: mm (inch)



Front View | Rear View | Side Views

Ordering Information

Available Models

VPort 36-1MP: H.264/MJPEG fixed box IP camera, 12/24 VDC or 24 VAC power input or Power-over-Ethernet, -25 to 60°C operating temperature
VPort 36-1MP-T: H.264/MJPEG fixed box IP camera, 12/24 VDC or 24 VAC power input or Power-over-Ethernet, -40 to 75°C operating temperature
VPort 36-1MP-IVA: H.264/MJPEG fixed box IP camera, 12/24 VDC or 24 VAC power input or Power-over-Ethernet, -25 to 60°C operating temperature, 1 IVA license
VPort 36-1MP-IVA-T: H.264/MJPEG fixed box IP camera, 12/24 VDC or 24 VAC power input or Power-over-Ethernet, -40 to 75°C operating temperature, 1 IVA license

Optional Accessories (can be purchased separately)

VP-CI701: IP68-rated outdoor housing, 406(L) x 109(H) x 145 (W) mm
VP-CI800: Wall-mounting bracket for outdoor housing, 213 (L) x 146 (H) x 80(W) mm
VP-CI815: Pole-mounting bracket for Ø70 to Ø230 mm pole
VP-CI820: Pole-mounting bracket for Ø360 mm pole
SoftNVR-IA: 64-channel IP surveillance software for industrial automation applications
DR-4524/75-24/120-24: 45/75/120 W DIN rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN rail 24 VDC power supplies, -20 to 70°C operating temperature

Package Checklist

- VPort 36-1MP series IP camera
- Inner hexagon screwdriver
- C/CS-mount adapter ring
- 5-pin terminal block
- 3-pin terminal block
- 2-pin terminal block
- Quick installation guide (printed)
- Software and document CD
- Warranty card

3.1-8 mm F1.2 Day & Night Lens

Optional lens for the VPort 36-1MP series.

VP-3112MPIR

Mounting Type: CS mount
Iris: DC Auto Iris
Focus: Manual
Zoom: Manual
Dimensions: Ø37 x 48.2 x 55 mm
Weight: 59 g
Angle of View:

Angle of View	D	1/2.7 type (16:9)	123.1°- 48.3°	1/2.7 type (4:3)	123.1°- 48.3°
	H		105.4°- 42.2°		95.9°- 38.7°
	V		57.9°- 23.8°		71.0°- 29.1°

3.1-8 mm F1.2 Day & Night Lens

Optional lens for the VPort 36-1MP series.

VP-3113MPIR

Mounting Type: CS mount
Focus: Manual
Zoom: Manual
Dimensions: Ø37 x 48.2 x 55 mm
Weight: 59 g
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nC nA nL IIC T4
Angle of View:

Angle of View	D	1/2.7 type (16:9)	123.1°- 48.3°	1/2.7 type (4:3)	123.1°- 48.3°
	H		105.4°- 42.2°		95.9°- 38.7°
	V		57.9°- 23.8°		71.0°- 29.1°

12.5-50 mm F1.4 Day & Night Lens

Optional lens for the VPort 36-1MP series.

VP-1214MPIR

Mounting Type: CS mount
Iris: DC Auto Iris
Focus: Manual
Zoom: Manual
Dimensions: Ø46 x 59.3 x 58.4 mm
Weight: 74 g
Angle of View:

Angle of View	D	1/2.7 type (16:9)	30.3° - 7.7°	1/2.7 type (4:3)	30.3° - 7.7°
	H		26.3° - 6.7°		24.0° - 6.2°
	V		14.5° - 3.8°		17.8° - 4.7°

VPort 26A-1MP Series

HD, IP66, vandal-proof, day and night, fixed dome IP cameras

- > -40 to 50°C or -40 to 75°C (T model) operating temperature, without heater or fan
- > 1/2.7" progressive scan camera with maximum 1280 x 800 resolution at up to 30 frames/second
- > DNR and WDR for superb image quality
- > Triple video streams with H.264 and MJPEG
- > 3 to 9 mm day-and-night vari-focal lens with a built-in ICR (removable IR-cut filter ICR)
- > DynaStream™ support for maximum network efficiency
- > CBR Pro™ support for high image quality in limited bandwidth transmissions
- > ONVIF support for standardization and interoperability

DynaStream ONVIF EN 50121 c UL us LISTED CE FC

Introduction

The VPort 26A-1MP is an IK10, IP66-rated, fixed dome HD IP camera for harsh, outdoor environments. With a maximum resolution of 1280 x 800, H.264/MJPEG triple video streams, and day-and-night camera lens, the VPort 26A-1MP is especially well-suited for outdoor video surveillance applications.

Specifications

Camera

Sensor: 1/2.7" HD progressive scan CMOS
Lens: 3X (controlled manually), f=3 mm (wide) to 9 mm (tele), F1.2 to F2.3
• Horizontal angle of view: 121.2° to 38.1°
• Vertical angle of view: 62.1° to 21.2°
• Diagonal: 148.4° to 48.8°
Camera Angle (controlled manually):
• Pan: ±175°, Tilt: 0 to 85°
• Rotation: Pan: ±180°
Minimum Illumination:
• Color: 0.2 lux at F1.2
• B/W: 0.05 lux at F1.2
Day & Night: Auto/Color/BW; ICR control
Synchronization: Internal
White Balance: ATW/AWB
Electronic Shutter: Fixed (1/30 to 1/25000 sec)
S/N Ratio: 50 dB (AGC OFF, DNR ON)
ICR Control: Auto (light sensor control) or DI control
DNR: Built-in DNR (digital noise reduction)
AGC (auto gain control): 2X, 4X, 8X, 16X, 32X, 64X
IRIS: Auto, DC drive
WDR: Levels 1-8
• color: 100 dB
• B/W: 110 dB
Auto Exposure: Level ±5
Image Rotation: Flip, Mirror, and 180° rotation
Image Setting: Manual tuning with saturation, sharpness, and contrast
Black Level Control: High, Medium, Low

Video

Video Compression: H.264 (ISO/IEC 14496-10) or MJPEG
Video Output: Via Ethernet
Video Streams: 3, H.264, or MJPEG independent video streams

Video Resolution and FPS (frames per second):

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
QCIF	176 x 112	30	176 x 144	25
QVGA	320 x 240	30	320 x 240	25
CIF	352 x 240	30	352 x 288	25
VGA	640 x 480	30	640 x 480	25
4CIF	704 x 480	30	704 x 576	25
Full D1	720 x 480	30	720 x 576	25
SVGA	800 x 600	30	800 x 600	25
HD	1280 x 720	30	1280 x 720	25

Multiple streams may not support up to 30 FPS.

Video Viewing:
• DynaStream™ support for changing the video frame rate automatically
• 3 privacy mask areas provided
• Adjustable image size and quality
• Timestamp and text overlay
• Maximum of 5 simultaneous unicast connections, 50 multicast clients
• ROI (Region of Interest) configuration for up to 3 areas

Audio

Audio Inputs: 1 line-in with 2-pin terminal block connector
Audio Outputs: 1 line-out with 2-pin terminal block connector
Audio Format: Mono, PCM (G.711)

Network

Protocols: TCP, UDP, HTTP, SMTP, FTP, Telnet, NTP, DNS, DHCP, UPnP, RTP, RTSP, ICMP, IGMPv3, QoS, SNMPv1/v2c/v3, DDNS, Modbus/TCP, 802.1X, SSH/HTTPS
Ethernet: 1 10/100BaseT(X) Ethernet port, RJ45 connector

Local Storage

SD Socket: Standard SD slot (SDHC)

GPIO

Digital Inputs: 1, max. 8 mA
• High: +13 V to +30 V
• Low: -30 V to +3 V
Relay Outputs: 1, max. 24 VDC @ 1 A

LED Indicators
STAT: Indicates if the system is booted properly or not
Network: 10 Mbps or 100 Mbps
Power: Power on/off
DIP Switch: To turn the LED light on/off

Power Requirements
Input Voltage:
• VPort 26A-1MP: 12 to 24 VDC or 24 VAC
• VPort P26A-1MP: PoE, IEEE 802.3af
Input Current:
• VPort 26A-1MP: 12 to 24 VDC, 500 mA or 24 VAC, 5.5 W
• VPort P26A-1MP: 48 VDC, 180 mA
Power Consumption:
• VPort 26A-1MP: 5.5 W
• VPort P26A-1MP: 5.8 W

Physical Characteristics
Housing: Metal, IP66 rated for rain and dust protection
Vandal Resistance: EN 62262, IK10
Dimensions:
Diameter: 149 mm (5.86 in)
Height: 120 mm (4.72 in)
Weight: 1.39 kg (3.06 lb)
Installation: Surface mounting (standard), outdoor mounting with optional accessories

Alarms
Intelligent Video: Tamper alarm
Video Motion Detection: Includes sensitivity settings
Scheduling: Daily repeat timing schedule
Imaging: JPEG snapshots for pre/trigger/post alarm images
Custom Alarms: HTTP event servers and CGI events for setting customized alarm actions
Email/FTP Messaging: Automatic transfer of stored images via email or FTP as event-triggered actions
Pre-alarm Buffer: 24 MB video buffer for JPEG snapshot images

Security
Password: User level password protection
Filtering: By IP address
Authentication: 802.1X
Encryption: HTTPS, SSH

Environmental Limits
Operating Temperature:
Standard models: -40 to 50°C (-40 to 122°F)
Wide temp. models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Vibration:
IEC 60068-2-6, 2 to 13.2 Hz: 2 mm (peak-peak); 13.2 to 100 Hz: 0.7g; 1.50 hrs/axis
IEC 60068-2-6, 3 to 9 Hz: 7 mm (peak-peak); 9 to 150 Hz: 1.0g; 1.86 hrs/axis
Shock: IEC 60068-2-27, 20g/11ms
Altitude: Up to 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

Standards and Certifications
Safety: UL 60950-1
Rail Traffic: EN50121-4: 2006 (VPort 26A-1MP series)
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8

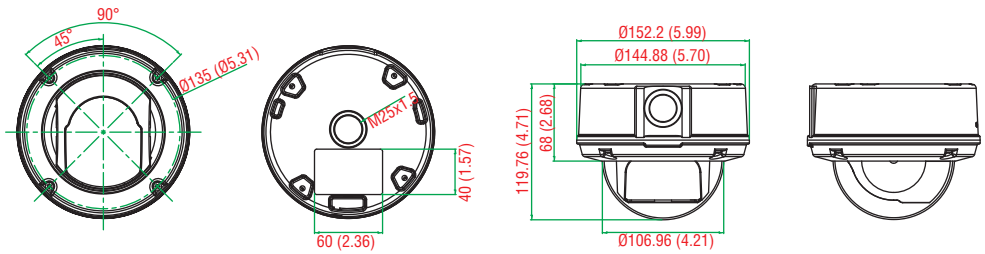
MTBF (mean time between failures)
Time: 201,721 hrs
Standard: Telcordia SR332

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Minimum Viewing System Requirements
CPU: Pentium 4, 2.4 GHz
Memory: 512 MB of memory
OS: Windows XP/2000 with SP4 or above, Windows Vista, Windows 7
Browser: Internet Explorer 9.x or above
Multimedia: DirectX 9.0c or above
Note: These preliminary specifications are subject to change without notice. Please check our website or with a sales representative for the most up-to-date specifications.

Software Development
VPort SDK PLUS: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third third-party developers (the latest version of the SDK is available for download from Moxa's website).
Standard: ONVIF Profile S

Dimensions
Unit: mm (inch)



Top View Side View

Ordering Information

Standard Temp. Models (RJ45: -40 to 50°C; M12: -25 to 55°C)	Wide Temp. Models (-40 to 75°C)	12/24 VDC, 24 VAC Power supply	PoE (802.3af) Power supply
VPort 26A-1MP	VPort 26A-1MP-T	✓	–
VPort P26A-1MP	VPort P26A-1MP-T	–	✓

Optional Accessories (can be purchased separately)
VP-MK2: Wall-mounting or pendant-mounting kit for the VPort 26 series
VP-520L: Wall-mounting kit (for fixed dome), 210(D) x 160(H) x 100(W) mm
VP-520HB: Pendant-mounting kit for mounting the VPort 26 on the ceiling
VP-CPM: Pole/corner-mounting kit for the VP-520L, 56.6(D) x 156.6(W) x 126(H) mm
DR-4524/75-24/120-24: 45/75/120 W DIN rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN rail 24 VDC power supplies, -20 to 70°C operating temperature
SoftNVR-IA V3.0: 64-channel IP surveillance software for industrial automation applications

Package Checklist
- VPort 26A-1MP or VPort P26A-1MP IP camera
- Mounting sticker
- 4 self-tapping screws and anchors
- IP66 cable glands
- L-type Torx screwdriver
- Quick installation guide (printed)
- Documentation and software CD
- Warranty card

VPort P16-1MP-M12 Series

EN 50155 compliant, HD video image, rugged IP cameras

- Essential compliance with EN 50155* (T1 temperatures: -25 to 55°C; TX temperatures: -40 to 70°C), and compliant with EN 50121-3-2
- 1/2.7" progressive scan camera with maximum 1280 x 800 resolution at up to 30 frames per second
- Built-in light sensor for day & night images
- High quality video images with DNR and WDR
- Up to 3 H.264 or MJPEG independent video streams
- DynaStream™ supported for network efficiency
- CBR Pro™ supported for high image quality in limited bandwidth transmissions
- Supports DHCP Opt 66/67 for auto-configuration
- ONVIF supported for standardization and interoperability

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

DynaStream ONVIF

c UL us LISTED EN 50155 CE FC

Introduction

The rugged VPort P16-1MP-M12 cameras provide an HD (720P, 1280 x 720) video image, and feature an H.264/MJPEG IP dome, giving them the versatility and ruggedness to excel in many different installations and environments for mobile IP video surveillance applications. In addition, the cameras are compliant with essential sections of EN 50155, covering operating temperature, power input voltage, surge, ESD, and vibration, as well as conformal coating and power insulation, making them suitable for a variety of industrial applications, and feature vandal-proofing (EN 62262 IK10), a -25 to 55°C or -40 to 70°C (T models) operating temperature, a rugged M12 Ethernet port, PoE power inputs, IP66 rain and dust protection, and day & night image capability.

Specifications

Camera

Sensor: 1/2.7" HD progressive scan CMOS
Lens: 3.6, 8 mm fixed focal length
Angle of View:
• 3.6 mm, F1.6: Diagonal 120°, Horizontal 96°, Vertical 56°
• 8.0 mm, F1.8: Diagonal 48°, Horizontal 38°, Vertical 24°
Illumination (low light sensitvity):
• Color: 0.2 Lux @ F1.2
• B/W: 0.05 Lux @ F1.2
Camera Angle: Pan 350°, Tilt 80° (controlled manually)
ICR Control (for day & night): Auto
Synchronization: Internal
White Balance: ATW/AWC
Electronic Shutter: Auto, fixed (1/30 to 1/25000 sec)
S/N Ratio: 50 dB (Gamma, Aperture, AGC, OFF; DNR ON)
DNR: Built-in
WDR: Levels 1-8, up to 155 dB
AGC Control: 2X, 4X, 8X, 16X, 32X, 64X
Flickerless Control: Automatic/50 Hz/60 Hz
Auto Exposure: Level ±5
Image Rotation: Flip, Mirror, and 180° rotation
Image Setting: Manual tuning with saturation, sharpness, and contrast
Black Level Control: High/Medium/Low

Video

Video Compression: H.264 (ISO/IEC 14496-10) or MJPEG
Video Output: Via Ethernet
Video Streams: 3 independent H.264 or MJPEG video streams
Video Resolution and FPS (frames per second):

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
QCIF	176 x 112	30	176 x 144	25
QVGA	320 x 240	30	320 x 240	25
CIF	352 x 240	30	352 x 288	25
VGA	640 x 480	30	640 x 480	25
4CIF	704 x 480	30	704 x 576	25
Full D1	720 x 480	30	720 x 576	25
SVGA	800 x 600	30	800 x 600	25
HD	1280 x 720	30	1280 x 720	25
WXGA	1280 x 800	30	1280 x 800	25

Video Viewing:
• CBR Pro™ for good image quality in limited bandwidth transmissions
• DynaStream™ supported for automatic frame rate adjustment
• 3 configurable privacy mask areas
• Adjustable image size and quality
• Timestamp and text overlay
• OSD (On screen Display) position adjustable
• Maximum of 5 simultaneous unicast connections

Network

Protocols: TCP/IP, UDP, HTTP, SMTP, NTP, DNS, DHCP, UPnP, RTP, RTSP, ICMP, QoS, IGMPv3, SNMPv1/v2c/v3, DDNS, TFTP, ARP, DHCP, OPT66/67
Ethernet: 1 10/100BaseT(X) isolated Ethernet port, 4-pin M12 Dcode female connector

Power Requirements

Input: Power-over-Ethernet (IEEE 802.3af)
Power Consumption: 5 W (max.)

Physical Characteristics

Housing: Metal housing and dome cover with IP66 rain and dust protection
Dimensions: 125 x 125 x 120.7 mm (5.6 x 5.6 x 4.8 in)
Weight: 820 g (1.8 lb)
Installation: Surface (ceiling) mounting, flush (recessed) mounting

Alarms

Intelligent Video: Camera tamper
Video Motion Detection: 3 independently configurable areas
Scheduling: Daily repeat timing schedule
Imaging: JPEG snapshots for pre/trigger/post alarm images
Custom Alarms: HTTP event servers for setting customized alarm actions
Email/FTP Messaging: Automatic transfer of stored images via email or FTP as event-triggered actions
Pre-alarm Buffer: 12 MB video buffer for JPEG snapshot images

Security

Password: User level password protection
Filtering: By IP address
Encryption: HTTPS, SSH

Environmental Limits

Operating Temperature:
Standard Models: -25 to 55°C (-13 to 131°F)
Wide Temp. Models: -40 to 70°C (-40 to 158°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Altitude: 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

Standards and Certifications

Safety: UL 60950-1
Rail Traffic: EN 50155 (essential compliance*), EN 45545-2
EMI: FCC Part 15, CISPR (EN 55022) Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
Shock: IEC 61373
Freefall: IEC 60068-2-32
Vibration: IEC 61373
Vandal Resistance: EN 62262, IK10 level
Salt Spray Test: ASTM B117
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time: 1,602,553 hrs
Standard: Telcordia TR/SR

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Minimum Viewing System Requirements

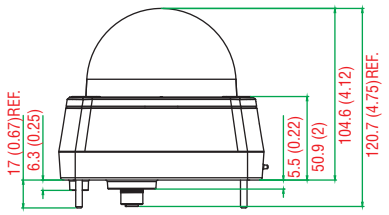
CPU: Pentium 4, 2.4 GHz
Memory: 512 MB of memory
OS: Windows XP/2000 with SP4 or above, Windows Vista, Windows 7
Browser: Internet Explorer 9.x or above
Multimedia: DirectX 9.0c or above

Software Development

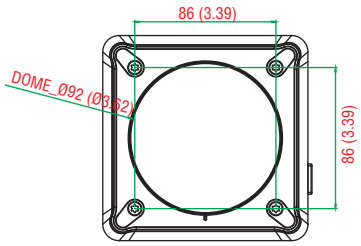
VPort SDK PLUS: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (the latest version of SDK is available for download from Moxa's website).
Standard: ONVIF ProfileS

Dimensions

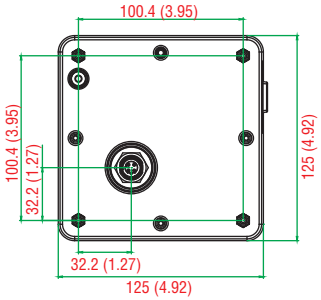
Unit: mm (inch)



Front View



Bottom View



Top View

Ordering Information

Model	Lens		Operating Temperature		Conformal Coating
PoE (802.3af)	3.6 mm	8.0 mm	-25 to 55°C	-40 to 70°C	
VPort P16-1MP-M12-CAM36	✓	–	✓	–	–
VPort P16-1MP-M12-CAM80	–	✓	✓	–	–
VPort P16-1MP-M12-CAM36-T	✓	–	–	✓	–
VPort P16-1MP-M12-CAM80-T	–	✓	–	✓	–
VPort P16-1MP-M12-CAM36-CT	✓	–	✓	–	✓
VPort P16-1MP-M12-CAM80-CT	–	✓	✓	–	✓
VPort P16-1MP-M12-CAM36-CT-T	✓	–	–	✓	✓
VPort P16-1MP-M12-CAM80-CT-T	–	✓	–	✓	✓

Package Checklist

- VPort P16-1MP-M12 IP camera
- L-type Torx screw driver
- 4 nuts and 4 washers
- 4 top cover screws for flush mounting
- Installation sticker
- Quick installation guide (printed)
- Documentation and software CD
- Warranty card

VPort P16-2MR Series

Preliminary

EN 50155 compliant, 1080P video image, infrared IP cameras

- Compliant with EN 50121-3-2 and essential sections* of EN 50155 (T1 temperatures: -25 to 55°C; TX temperatures: -40 to 70°C)
- 1/3" progressive scan camera with maximum 1920 x 1080 resolution at up to 30 FPS
- Built-in IR illuminator and ICR (Infrared Cut-filter Removal) for day & night images
- High quality video image with DNR and WDR
- Up to 4 H.264 or MJPEG independent simultaneous video streams
- DynaStream™ for optimized network efficiency
- CBR Pro™ for high image quality in limited bandwidth transmissions
- Supports SDXC (up to 1 TB SD card) for local storage
- 1 built-in audio input or microphone
- ONVIF comformity for standardization and interoperability

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

DynaStream ONVIF c UL us LISTED EN 50155 CE FC

Introduction

The rugged VPort P16-2MR cameras produce Full FHD (1920 x 1080) video images and feature an H.264/MJPEG IP camera dome, giving them the versatility and ruggedness needed for mobile IP video surveillance applications in a variety of different installations and environments. In addition, the cameras feature EN 50155 compliance, vandal-proofing (EN 62262 IK8), a -25 to 55°C or -40 to 70°C (T models) operating temperature, a rugged M12 Ethernet port, PoE power input, a built-in microphone, a digital input, IP66 rain and dust protection, and an IR illuminator for day & night image capability.

Specifications

Camera

Sensor: 1/3" HD progressive scan CMOS
Lens: 3.6, 4.2, 6, 8 mm fixed focal lengths
Angle of View:
• 3.6 mm, F1.6: Diagonal 99°, Horizontal 70°, Vertical 39°
• 4.2 mm, F1.6: Diagonal 82°, Horizontal 62°, Vertical 34°
• 6.0 mm, F1.8: Diagonal 62°, Horizontal 43°, Vertical 24°
• 8.0 mm, F1.6: Diagonal 42°, Horizontal 33°, Vertical 17°
Illumination (low light sensitivity):
• Color: 0.2 Lux @ F1.2
• B/W: 0.05 Lux @ F1.2 (0 lux if IR illuminator is on)
Camera Angle: Pan 350°, Tilt 65° (controlled manually)
ICR Control (for day & night): Auto
IR Illumination: 3 IR LED illuminators, 5-meter (max.) effective distance; On/Off controlled manually (night mode) or by the light sensor.
Synchronization: Internal
White Balance: ATW/AWB
Electronic Shutter: Auto, Fixed (1/30 to 1/25000 sec)
DNR: Built-in
WDR: On/Off, up to 100 dB
AGC Control: 2X, 4X, 8X, 16X
Flickerless Control: Automatic, 50 Hz, 60 Hz
Auto Exposure: Level ±5
Image Rotation: Flip, Mirror, 90°, 180°, 270° rotation
Image Setting: Manual tuning with saturation, sharpness, and contrast
Black Level Control: High/Medium/Low

Video

Video Compression: H.264 (ISO/IEC 14496-10) or MJPEG
Video Outputs: Via Ethernet
Video Streams: 4

Video Resolution and FPS (frames per second):

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
QCIF	176 x 112	30	176 x 144	25
CIF	352 x 240	30	352 x 288	25
VGA	640 x 480	30	640 x 480	25
4CIF	704 x 480	30	704 x 576	25
Full D1	720 x 480	30	720 x 576	25
SVGA	800 x 600	30	800 x 600	25
HD	1280 x 720	30	1280 x 720	25
WXGA	1280 x 800	30	1280 x 800	25
Full FHD	1920 x 1080	30	1920 x 1080	30

Video Viewing:
• CBR Pro™ for good image quality in limited bandwidth transmissions
• DynaStream™ support for automatic frame rate adjustment
• 3 configurable privacy mask areas
• Adjustable image size and quality
• Timestamp and text overlay
• OSD (On Screen Display) position adjustable
• Maximum of 5 simultaneous unicast connections

Audio

Audio Inputs: 1, built-in microphone
Audio Format: PCM (G.711), AAC

Network

Protocols: TCP/IP, UDP, HTTP, SMTP, NTP, DNS, DHCP, UPnP, RTP, RTSP, ICMP, QoS, IGMPv3, SNMPv1/v2c/v3, DDNS, TFTP, ARP, DHCP, OPT66/67
Ethernet: 1 10/100BaseT(X) isolated Ethernet port, 4-pin M12 Dcode female connector, with 20 cm cable

Local Storage

SD Socket: Micro SD socket
Interface: SDXC (can support up to 1 TB)

GPIO
Digital Inputs: 1, 5-pin M12 male connector with 20 cm cable
• High: +13 V to +30 V
• Low: -30 V to +3 V

Power Requirements
Input: Power-over-Ethernet (IEEE 802.3af)
Power Consumption: 12.5 W (max.)

Physical Characteristics
Housing: Metal housing and dome cover with IP66 rain and dust protection
Dimensions: 125 x 125 x 120.7 mm (5.6 x 5.6 x 4.8 in)
Weight: 820 g (1.8 lb)
Installation: Surface (ceiling) mounting, flush (recessed) mounting

Alarms
Intelligent Video: Camera tamper
Video Motion Detection: 3 independently configurable areas
Shock: G sensor for shock detection
Scheduling: Daily repeat timing schedule
Imaging: JPEG snapshots for pre/trigger/post alarm images
Custom Alarms: HTTP event servers for setting customized alarm actions
Email/FTP Messaging: Automatic transfer of stored images via email or FTP as event-triggered actions
Pre-alarm Buffer: 50 MB video buffer for JPEG snapshot images

Security
Password: User level password protection
Filtering: By IP address
Encryption: HTTPS, SSH

Environmental Limits
Operating Temperature:
Standard models: -25 to 55°C (-13 to 131°F)
Wide Temp. models: -40 to 70°C (-40 to 158°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Altitude: 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

Standards and Certifications
Safety: UL 60950-1
Rail Traffic: EN 50155 (essential compliance*)
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
EMI: FCC Part 15, CISPR (EN 55022) Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Shock: IEC 61373
Freefall: IEC 60068-2-32
Vibration: IEC 61373
Vandal Resistance: EN 62262, IK8 level
Salt Spray Test: ASTM B117
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)
Time: 997,474 hrs
Standard: Telcordia TR/SR

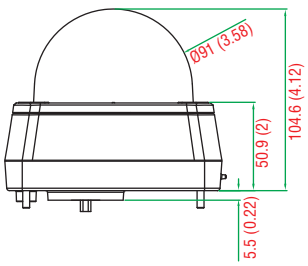
Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Minimum Viewing System Requirements
CPU: Pentium 4, 2.4 GHz
Memory: 512 MB of memory
OS: Windows XP with SP3 or above, Windows 7
Browser: Internet Explorer 8.x or above
Multimedia: DirectX 9.0c or above

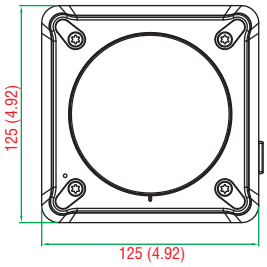
Software Development
VPort SDK PLUS: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (the latest version of SDK is available for download from Moxa's website).
Standard: ONVIF Profile S

Dimensions

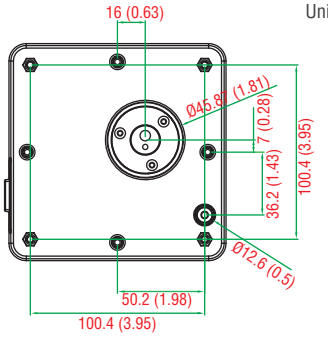
Unit: mm (inch)



Front View



Bottom View



Top View

Ordering Information

Model	Lens (mm)				Operating Temp. Range		Conformal Coating
	3.6	4.2	6.0	8.0	-25 to 55°C	-40 to 70°C	
VPort P16-2MR36M	✓	–	–	–	✓	–	–
VPort P16-2MR42M	–	✓	–	–	✓	–	–
VPort P16-2MR60M	–	–	✓		✓	–	–
VPort P16-2MR80M	–	–	–	✓	✓	–	–
VPort P16-2MR36M-T	✓	–	–	–	–	✓	–
VPort P16-2MR42M-T	–	✓	–	–	–	✓	–
VPort P16-2MR60M-T	–		✓	–	–	✓	–
VPort P16-2MR80M-T	–	–	–	✓	–	✓	–
VPort P16-2MR36M-CT	✓	–	–	–	✓	–	✓
VPort P16-2MR42M-CT	–	✓	–	–	✓	–	✓
VPort P16-2MR60M-CT	–	–	✓	–	✓	–	✓
VPort P16-2MR80M-CT	–	–	–	✓	✓	–	✓
VPort P16-2MR36M-CT-T	✓	–	–	–	–	✓	✓
VPort P16-2MR42M-CT-T	–	✓	–	–	–	✓	✓
VPort P16-2MR60M-CT-T	–	–	✓	–	–	✓	✓
VPort P16-2MR80M-CT-T	–	–	–	✓	–	✓	✓

Package Checklist
- VPort P16-2MR IP camera
- L-type Torx screwdriver
- 4 nuts and 4 washers
- 4 top cover screws for flush mounting
- Installation sticker
- Quick installation guide (printed)
- Documentation and software CD
- Warranty card

VPort P16-1MP-M12-IR Series

EN 50155 compliant, HD video image, infrared IP cameras

- Compliant with EN 50121-3-2 and essential sections* of EN 50155 (T1 temperatures: -25 to 55°C; TX temperatures: -40 to 70°C)
- Maximum 1280 x 800 resolution at up to 30 frames/second
- Built-in IR illuminator and ICR (Infrared Cutfilter Removal) for day & night images
- Up to 3 H.264 or MJPEG independent video streams
- DynaStream™ support for maximum network efficiency
- CBR Pro™ support for high image quality in limited bandwidth transmissions

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

DynaStream ONVIF

c UL us LISTED EN 50155 CE FC

Introduction

The rugged VPort P16-1MP-M12-IR cameras produce HD (720P, 1280 x 720) video images and feature an H.264/MJPEG IP dome, giving them the versatility and ruggedness needed for mobile IP video surveillance applications in a variety of different installations and environments. In addition, the cameras feature EN 50155 compliance, vandal-proofing (EN 62262 IK10), a -25 to 55°C or -40 to 70°C (T models) operating temperature, a rugged M12 Ethernet port, PoE power input, a built-in microphone, a digital input, IP66 rain and dust protection, and an IR illuminator for day & night image capability.

Specifications

Camera

Sensor: 1/2.7" HD progressive scan CMOS
Lens: 3.6, 8 mm fixed focal length
Angle of View:
• 3.6 mm, F1.6: Diagonal 120°, Horizontal 96°, Vertical 56°
• 8.0 mm, F1.8: Diagonal 48°, Horizontal 38°, Vertical 24°
Illumination (low light sensitvity):
• Color: 0.2 lux @ F1.2
• B/W: 0.05 lux @ F1.2 (0 lux if IR illuminator is on)
Camera Angle: Pan 350°, Tilt 65° (controlled manually)
ICR Control (for day & night): Auto
IR Illumination: 3 IR LED illuminators, max. 5 meter effective distance. On/Off controlled manually (night mode) or by the light sensor.
Synchronization: Internal
White Balance: ATW/AWB
Electronic Shutter: Auto, Fixed (1/30 to 1/25000 sec)
S/N Ratio: 50 dB (Gamma, Aperture, AGC, OFF; DNR ON)
DNR: Built-in
WDR: Levels 1-8, up to 115 dB
AGC Control: 2X, 4X, 8X, 16X, 32X, 64X
Flickerless Control: Automatic / 50 Hz / 60 Hz
Auto Exposure: Level ±5
Image Rotation: Flip, Mirror, and 180° rotation
Image Setting: Manual tuning with saturation, sharpness, and contrast
Black Level Control: High/Medium/Low

Video

Video Compression: H.264 (ISO/IEC 14496-10) or MJPEG
Video Outputs: Via Ethernet
Video Streams: 3 independent H.264 or MJPEG video streams

Video Resolution and FPS (frames per second):

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
QCIF	176 x 112	30	176 x 144	25
CIF	352 x 240	30	352 x 288	25
VGA	640 x 480	30	640 x 480	25
4CIF	704 x 480	30	704 x 576	25
Full D1	720 x 480	30	720 x 576	25
SVGA	800 x 600	30	800 x 600	25
HD	1280 x 720	30	1280 x 720	25
WXGA	1280 x 800	30	1280 x 800	25

Video Viewing:
• CBR Pro™ for good image quality in limited bandwidth transmissions
• DynaStream™ support for automatic frame rate adjustment
• 3 configurable privacy mask areas
• Adjustable image size and quality
• Timestamp and text overlay
• OSD (On Screen Display) position adjustable
• Maximum of 5 simultaneous unicast connections

Audio

Audio Inputs: 1, built-in microphone
Audio Format: Mono, PCM (G.711)

Network

Protocols: TCP/IP, UDP, HTTP, SMTP, NTP, DNS, DHCP, UPnP, RTP, RTSP, ICMP, QoS, IGMPv3, SNMPv1/v2c/v3, DDNS, TFTP, ARP, DHCP, OPT66/67
Ethernet: 1 10/100BaseT(X) Ethernet port, 4-pin M12 Dcode female connector, with 20 cm cable

GPIO
Digital Inputs: 1, 5-pin M12 male connector with 20 cm cable
• High: +13 V to +30 V
• Low: -30 V to +3 V

Power Requirements
Input: Power-over-Ethernet (IEEE 802.3af)
Power Consumption: 8 W (max.)

Physical Characteristics
Housing: Metal housing and dome cover with IP66 rain and dust protection
Dimensions: 125 x 125 x 120.7 mm (5.6 x 5.6 x 4.8 in)
Weight: 820 g (1.8 lb)
Installation: Surface (ceiling) mounting, flush (recessed) mounting

Alarms
Intelligent Video: Camera tamper
Video Motion Detection: 3 independently configurable areas
Scheduling: Daily repeat timing schedule
Imaging: JPEG snapshots for pre/trigger/post alarm images
Custom Alarms: HTTP event servers for setting customized alarm actions
Email/FTP Messaging: Automatic transfer of stored images via email or FTP as event-triggered actions
Pre-alarm Buffer: 12 MB video buffer for JPEG snapshot images

Security
Password: User level password protection
Filtering: By IP address
Encryption: HTTPS, SSH

Environmental Limits
Operating Temperature: Standard models: -25 to 55°C (-13 to 131°F)
Wide Temp. model: -40 to 70°C (-40 to 158°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Altitude: 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

Standards and Certifications
Safety: UL 60950-1
Rail Traffic: EN 50155 (essential compliance*)
EMI: FCC Part 15, CISPR (EN 55022) Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
Shock: IEC 61373
Freefall: IEC 60068-2-32
Vibration: IEC 61373
Vandal Resistance: EN 62262, IK10 level
Salt Spray Test: ASTM B117
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)
Time: 1052184 hrs
Standard: Telcordia TR/SR

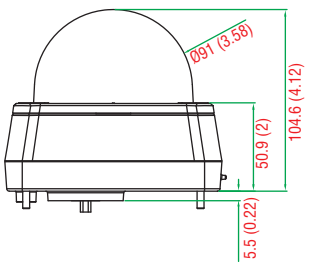
Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Minimum Viewing System Requirements
CPU: Pentium 4, 2.4 GHz
Memory: 512 MB of memory
OS: Windows XP with SP3 or above, Windows 7
Browser: Internet Explorer 8.x or above
Multimedia: DirectX 9.0c or above

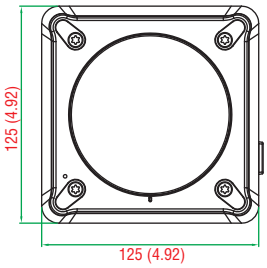
Software Development
VPort SDK PLUS: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (the latest version of SDK is available for download from Moxa's website).
Standard: ONVIF Profile S

Dimensions

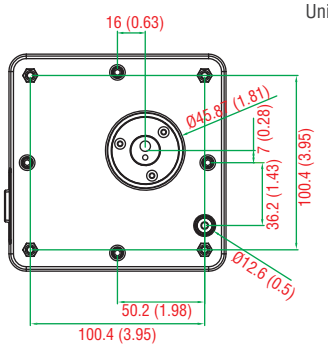
Unit: mm (inch)



Front View



Bottom View



Top View

Ordering Information

Model	Lens		Temperature		Conformal Coating
PoE (802.3af)	3.6 mm	8.0 mm	-25 to 55°C	-40 to 70°C	
VPort P16-1MP-M12-IR-CAM36	✓	–	✓	–	–
VPort P16-1MP-M12-IR-CAM80	–	✓	✓	–	–
VPort P16-1MP-M12-IR-CAM36-CT	✓	–	✓	–	✓
VPort P16-1MP-M12-IR-CAM80-CT	–	✓	✓	–	✓
VPort P16-1MP-M12-IR-CAM36-T	✓	–	–	✓	–
VPort P16-1MP-M12-IR-CAM80-T	–	✓	–	✓	–
VPort P16-1MP-M12-IR-CAM36-CT-T	✓	–	–	✓	✓
VPort P16-1MP-M12-IR-CAM80-CT-T	–	✓	–	✓	✓

Package Checklist
- VPort P16-1MP-M12 IP camera
- L-type Torx screwdriver
- 4 nuts and 4 washers
- 4 top cover screws for flush mounting
- Installation sticker
- Quick installation guide (printed)
- Documentation and software CD
- Warranty card

VPort 06-2 Series

EN 50155 compliant, 1080P video image, compact IP cameras

- Compliant with EN 50121-3-2 and essential sections* of EN 50155 (T1 temperatures: -25 to 55°C; TX temperatures: -40 to 70°C)
- 1/3" progressive scan camera with maximum 1920 x 1080 resolution at up to 30 frames/second
- High quality video image with DNR and WDR
- Up to 4 simultaneous H.264 or MJPEG independent video streams
- DynaStream™ support for optimized network efficiency
- CBR Pro™ support for high image quality in limited bandwidth transmissions
- Supports SDXC (up to 1 TB SD card)for local storage
- 1 built-in audio input or microphone
- ONVIF comformity for standardization and interoperability

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

DynaStream ONVIF

c UL us LISTED EN50155 CE FC

Introduction

The VPort 06-2 cameras are compact, 1080P (1920x1080), H.264/MJPEG dome IP cameras designed for mobile video surveillance applications. The cameras are compliant with EN 50121-3-2, EN 62262 IK8, essential sections of EN 50155, and support a -25 to 55°C or -40 to 70°C operating temperature range. With a rugged M12 Ethernet port, SDXC slot for SD cards 64 GB and larger, ONVIF Profile S standardization, built-in audio line port or microphone, PoE or 24 VDC power inputs, IP66 rain and dust protection, and the option of changing the lens, the VPort 06-2 cameras will perform reliably in a variety of extreme environmental conditions, making them suitable for a wide variety of mobile video surveillance applications.

Specifications

Camera

Sensor: 1/3" HD progressive scan CMOS
Lens: 2.5 mm, 3.6 mm, 4.2 mm, 6 mm, 8 mm fixed focal lengths
Angle of View:
• 2.5 mm, F1.6: Diagonal 120°, Horizontal 101°, Vertical 57°
• 3.6 mm, F1.6: Diagonal 99°, Horizontal 70°, Vertical 39°
• 4.2 mm, F1.6: Diagonal 82°, Horizontal 62°, Vertical 34°
• 6.0 mm, F1.8: Diagonal 62°, Horizontal 43°, Vertical 24°
• 8.0 mm, F1.6: Diagonal 42°, Horizontal 33°, Vertical 17°
Camera Angle:
• Pan: ±15°
• Tilt: 0 to 90° (3.6, 4.2, 6 mm lenses), 30 to 60° (2.5 mm lens)
Minimum Illumination: 0.2 Lux @ F=1.2
Synchronization: Internal
White Balance: ATW/AWB
Electronic Shutter: Auto, Fixed (1/30 to 1/25000 sec)
DNR: Built-in DNR
WDR: On/Off, up to 100 dB
AGC Control: 2X, 4X, 8X, 16X
Flickerless Control: Automatic, 50 Hz, 60 Hz modes
Auto Exposure: Level ±5
Image Rotation: Flip, Mirror, 90°, 180°, and 270° rotation
Image Setting: Manual tuning with saturation, sharpness, and contrast

Video

Video Compression: H.264 (ISO/IEC 14496-10) or MJPEG
Video Output: Via Ethernet
Video Streams: Up to 4 independent video streams
Video Resolution and FPS (frames per second):

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
QCIF	176 x 112	30	176 x 144	25
QVGA	320 x 240	30	320 x 240	25
CIF	352 x 240	30	352 x 288	25
VGA	640 x 480	30	640 x 480	25
4CIF	704 x 480	30	704 x 576	25
Full D1	720 x 480	30	720 x 576	25
SVGA	800 x 600	30	800 x 600	25
HD	1280 x 720	30	1280 x 720	25
WXGA	1280 x 800	30	1280 x 800	25
FHD	1920 x 1080	30	1920 x 1080	30

Video Viewing:
- DynaStream™ support for automatic frame rate adjustment
- CBR Pro™ for good image quality in limited bandwidth transmissions
- 3 privacy mask areas provided
- Adjustable image size and quality
- Timestamp and text overlay
- OSD (On Screen Display) position adjustable
- Maximum of 5 simultaneous unicast connections

Audio
Audio Inputs: 1 line-in, or 1 built in to the microphone input
Audio Format: G.711, AAC

Network
Protocols: TCP/IP, UDP, HTTP, SMTP, NTP, DNS, DHCP, UPnP, RTP, RTSP, ICMP, QoS, IGMPv3, SNMPv1/v2c/v3, DDNS, TFTP, ARP, DHCP, OPT66/67
Ethernet: 1 10/100BaseT(X) Ethernet port, 4-pin M12 D-coded female connector

Local Storage
SD Socket: Micro SD socket
Interface: SDXC

GPIO
Digital Inputs: 1, max. 8 mA; Low: +13 V to 30 V; High: -30 V to +3 V

Power Requirements
Input Voltage: VPort P06-2 (PoE model): PoE (IEEE 802.3af)
VPort 06-2 (DC model): 12 to 24 VDC with DB9 connector
Input Current: 0.38 to 0.86 A
Power Consumption:
VPort P06-2: 8.1 W (max.)
VPort 06-2: 9 W (max.)

Physical Characteristics
Housing: IP66 rain and dust protection, EN 62262 IK8 vandal proof metal housing
Dimensions: 110 x 115.5 x 61.8 mm (4.33 x 4.54 x 2.43 in)
Weight: 620 g (1.37 lb)
Installation: Surface or ceiling mounting
Note: Optional external housing and mounting accessories may be required.

Alarms
Intelligent Video: Camera tampering
Video Motion Detection: 3 independently configurable motion areas
Shock: G sensor for shock detection
Scheduling: Daily repeat timing schedule
Imaging: JPEG snapshots for pre/trigger/post alarm images
Custom Alarms: HTTP event servers for setting customized alarm actions
Email/FTP Messaging: Automatic transfer of stored images via email or FTP as event-triggered actions
Pre-alarm Buffer: 50 MB video buffer for JPEG snapshot images

Security
Password: User level password protection
Filtering: By IP address
Encryption: HTTPS, SSH

Environmental Limits
Operating Temperature:
Standard Models: -25 to 55°C (-13 to 131°F)
Wide Temp. Models: -40 to 70°C (-40 to 158°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Altitude: 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

Standards and Certifications
Safety: UL 60950-1
Rail Traffic: EN 50155 (essential compliance*)
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
EMC: EN 55022/24
EMI: FCC Part 15, CISPR (EN 55022) class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Shock: IEC 61373
Freefall: IEC 60068-2-32
Vibration: IEC 61373
Vandal Resistance: EN 62262, IK8 level
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)
Time: 977,972 hrs
Standard: Telcordia TR/SR

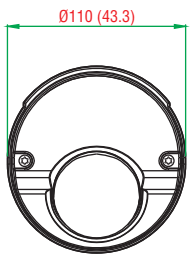
Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Minimum Viewing System Requirements
CPU: Pentium 4, 2.4 GHz
Memory: 512 MB of memory
OS: Windows XP/2000 with SP4 or above, Windows Vista, Windows 7
Browser: Internet Explorer 9 or above
Multimedia: DirectX 9.0c or above

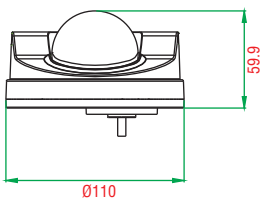
Software Development
VPort SDK PLUS: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (the latest SDK version is available for download from Moxa's website).
Standard: ONVIF Profile S

Dimensions

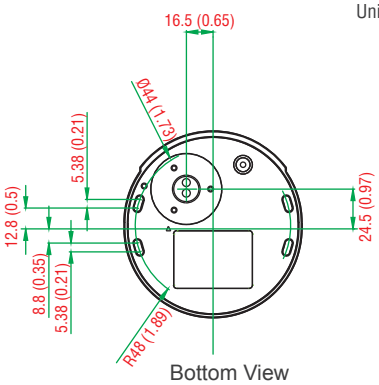
Unit: mm (inch)



Top View



Front View



Bottom View

Ordering Information

Model		Lens (mm)	Audio		Operating Temperature		Conformal Coating
PoE models	24 VDC models		Line-in	MIC	-25 to 55°C	-40 to 70°C	
VPort P06-2L25M	VPort 06-2L25M	2.5	✓	–	✓	–	–
VPort P06-2L36M	VPort 06-2L36M	3.6	✓	–	✓	–	–
VPort P06-2L42M	VPort 06-2L42M	4.2	✓	–	✓	–	–
VPort P06-2L60M	VPort 06-2L60M	6.0	✓	–	✓	–	–
VPort P06-2L80M	VPort 06-2L80M	8.0	✓	–	✓	–	–
VPort P06-2M25M	VPort 06-2M25M	2.5	–	✓	✓	–	–
VPort P06-2M36M	VPort 06-2M36M	3.6	–	✓	✓	–	–
VPort P06-2M42M	VPort 06-2M42M	4.2	–	✓	✓	–	–
VPort P06-2M60M	VPort 06-2M60M	6.0	–	✓	✓	–	–
VPort P06-2M80M	VPort 06-2M80M	8.0	–	✓	✓	–	–
VPort P06-2L25M-T	VPort 06-2L25M-T	2.5	✓	–	–	✓	–
VPort P06-2L36M-T	VPort 06-2L36M-T	3.6	✓	–	–	✓	–
VPort P06-2L42M-T	VPort 06-2L42M-T	4.2	✓	–	–	✓	–
VPort P06-2L60M-T	VPort 06-2L60M-T	6.0	✓	–	–	✓	–
VPort P06-2L80M-T	VPort 06-2L80M-T	8.0	✓	–	–	✓	–
VPort P06-2M25M-T	VPort 06-2M25M-T	2.5	–	✓	–	✓	–
VPort P06-2M36M-T	VPort 06-2M36M-T	3.6	–	✓	–	✓	–
VPort P06-2M42M-T	VPort 06-2M42M-T	4.2	–	✓	–	✓	–
VPort P06-2M60M-T	VPort 06-2M60M-T	6.0	–	✓	–	✓	–
VPort P06-2M80M-T	VPort 06-2M80M-T	8.0	–	✓	–	✓	–
VPort P06-2L25M-CT	VPort 06-2L25M-CT	2.5	✓	–	✓	–	✓
VPort P06-2L36M-CT	VPort 06-2L36M-CT	3.6	✓	–	✓	–	✓
VPort P06-2L42M-CT	VPort 06-2L42M-CT	4.2	✓	–	✓	–	✓
VPort P06-2L60M-CT	VPort 06-2L60M-CT	6.0	✓	–	✓	–	✓
VPort P06-2L80M-CT	VPort 06-2L80M-CT	8.0	✓	–	✓	–	✓
VPort P06-2M25M-CT	VPort 06-2M25M-CT	2.5	–	✓	✓	–	✓
VPort P06-2M36M-CT	VPort 06-2M36M-CT	3.6	–	✓	✓	–	✓
VPort P06-2M42M-CT	VPort 06-2M42M-CT	4.2	–	✓	✓	–	✓
VPort P06-2M60M-CT	VPort 06-2M60M-CT	6.0	–	✓	✓	–	✓
VPort P06-2M80M-CT	VPort 06-2M80M-CT	8.0	–	✓	✓	–	✓
VPort P06-2L25M-CT-T	VPort 06-2L25M-CT-T	2.5	✓	–	–	✓	✓
VPort P06-2L36M-CT-T	VPort 06-2L36M-CT-T	3.6	✓	–	–	✓	✓
VPort P06-2L42M-CT-T	VPort 06-2L42M-CT-T	4.2	✓	–	–	✓	✓
VPort P06-2L60M-CT-T	VPort 06-2L60M-CT-T	6.0	✓	–	–	✓	✓
VPort P06-2L80M-CT-T	VPort 06-2L80M-CT-T	8.0	✓	–	–	✓	✓
VPort P06-2M25M-CT-T	VPort 06-2M25M-CT-T	2.5	–	✓	–	✓	✓
VPort P06-2M36M-CT-T	VPort 06-2M36M-CT-T	3.6	–	✓	–	✓	✓
VPort P06-2M42M-CT-T	VPort 06-2M42M-CT-T	4.2	–	✓	–	✓	✓
VPort P06-2M60M-CT-T	VPort 06-2M60M-CT-T	6.0	–	✓	–	✓	✓
VPort P06-2M80M-CT-T	VPort 06-2M80M-CT-T	8.0	–	✓	–	✓	✓

Optional Accessories (can be purchased separately)

SoftNVR-IA V3.0: 64-channel IP surveillance software for industrial automation applications
VP-SCO2: Side-cable-out adapter for mounting the VPort 06-2 on a surface
VP-FP2: Fixed plate with threaded screw holes for mounting the VPort 06-2 directly over a ceiling aperature

Package Checklist

- VPort 06-2 series IP camera
- VP-DP01 (0.6 g dry packs x 2)
- L-type Torx screwdriver
- 4 indented hexagonal head tapping screws, nuts, gaskets, and spring washers
- Installation sticker
- Quick installation guide (printed)
- Documentation and software CD
- Warranty card

Side-cable-out adapter for surface mounting

VP-SCO2
Dimensions: Ø110 x 17 (H) mm
Material: Plastic
Operating temperature: -30 to 120°C
Weight: 60 g

Plate with threaded screw holes for ceiling mounting

VP-FP2
Dimensions: 110 (L) x 40 (W) mm
Material: Metal
Weight: 40 g

VPort P06-1MP-M12 Series

EN 50155 compliant, HD video image, compact IP cameras

- Compliant with EN 50121-3-2
- Essential compliance with EN 50155* (standard model supports T1 temperatures, -25 to 55°C; T model supports TX temperatures, -40 to 70°C)
- 1/2.7" progressive scan camera with maximum 1280 x 800 resolution at up to 30 frames/second
- High quality video image with DNR and WDR
- Up to 3 H.264 or MJPEG independent video streams
- DynaStream™ support for maximized network efficiency
- CBR Pro™ support for high image quality in limited bandwidth transmissions
- Supports DHCP Opt 66/67 for auto-configuration
- 1 built-in audio input or microphone
- ONVIF support for standardization and interoperability

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

DynaStream ONVIF

c UL us LISTED EN50155 CE FC

Introduction

The compact VPort P06-1MP-M12 cameras provide an HD (720P, 1280 x 720) video image, and feature an H.264/MJPEG IP dome, giving them the versatility and ruggedness to excel in many different installations and environments for mobile IP video surveillance applications. In addition, the cameras are compliant with essential sections of EN 50155, covering operating temperature, power input voltage, surge, ESD, and vibration, as well as conformal coating and power insulation, making them suitable for a variety of industrial applications. The cameras feature vandal-proofing (EN 62262 IK8), a -25 to 55°C or -40 to 70°C (T models) operating temperature range, a rugged M12 Ethernet port, 1 audio input, PoE power inputs, IP66 rain and dust protection, a dehumidifying membrane, and a selectable lens.

Specifications

Camera

Sensor: 1/2.7" HD progressive scan CMOS
Lens: 2.5, 3.6, 4.2, 6 mm fixed focal length
Angle of View:
• 2.5 mm F2.8: Diagonal 170°, Horizontal 130°, Vertical 98°
• 3.6 mm, F1.6: Diagonal 120°, Horizontal 96°, Vertical 56°
• 4.2 mm, F1.6: Diagonal 96°, Horizontal 81°, Vertical 47°
• 6.0 mm, F1.8: Diagonal 66°, Horizontal 51°, Vertical 38°
• 8.0 mm, F1.8: Diagonal 44, Horizontal 38, Vertical 24
Camera Angle:
• Pan: ±30°
• Tilt: 0-90° (3.6, 4.2, 6 mm lens), 30-60° (2.5 mm lens)
Minimum Illumination: 0.2 Lux @ F=1.2
Synchronization: Internal
White Balance: ATW/AWB
Electronic Shutter: Auto (1/30 to 1/25000 sec.)
S/N Ratio: 50 dB (Gamma, Aperture, AGC, OFF; DNR ON)
DNR: Built-in DNR
WDR: Level 1-8, up to 115 dB
AGC Control: 2X, 4X, 8X, 16X, 32X, 64X
Flickerless Control: Automatic/50 Hz/60 Hz mode
Auto Exposure: Level ±5
Image Rotation: Flip, Mirror, and 180° rotation
Image Setting: Manual tuning with saturation, sharpness, and contrast
Black Level Control: High/Medium/Low

Video

Video Compression: H.264 (ISO/IEC 14496-10) or MJPEG
Video Output: Via Ethernet
Video Streams: 3 independent H.264 or MJPEG video streams
Video Resolution and FPS (frames per second):

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
QCIF	176 x 112	30	176 x 144	25
QVGA	320 x 240	30	320 x 240	25
CIF	352 x 240	30	352 x 288	25
VGA	640 x 480	30	640 x 480	25
4CIF	704 x 480	30	704 x 576	25
Full D1	720 x 480	30	720 x 576	25
SVGA	800 x 600	30	800 x 600	25
HD	1280 x 720	30	1280 x 720	25
WXGA	1280 x 800	30	1280 x 800	25

Video Viewing:
- DynaStream™ support for automatic frame rate adjustment
- CBR Pro™ for good image quality in limited bandwidth transmission
- 3 privacy mask areas configurable
- Adjustable image size and quality
- Timestamp and text overlay
- OSD (On screen Display) position adjustable
- Maximum of 5 simultaneous unicast connections

Audio

Audio Inputs: 1, Line-in, rugged RCA connector; or 1 bulit-in microphone input
Audio Format: Mono, PCM (G.711)

Network

Protocols: TCP/IP, UDP, HTTP, SMTP, NTP, DNS, DHCP, UPnP, RTP, RTSP, ICMP, QoS,IGMPv3, SNMPv1/v2c/v3, DDNS, TFTP, ARP, DHCP, OPT66/67
Ethernet: 1 10/100BaseT(X) isolated Ethernet port, 4-pin M12 D-coded female connector

Power Requirements

Input: Power-over-Ethernet (IEEE 802.3af)
Power Consumption: 6 W (max.)

Physical Characteristics

Housing: IP66 rain and dust protection, EN 62262 IK9 vandal-proof protection
Dimensions: Diameter: 110 mm (4.33 in); Height: 47 mm (1.85 in)
Weight: 310 g (0.68 lb)
Installation: Surface or ceiling mounting
Note: Optional external housing and mounting accessories may be required.

Alarms

Intelligent Video: Camera tamper
Video Motion Detection: 3 independently configurable motion areas
Scheduling: Daily repeat timing schedule
Imaging: JPEG snapshots for pre/trigger/post alarm images
Custom Alarms: HTTP event servers for setting customized alarm actions
Email/FTP Messaging: Automatic transfer of stored images via email or FTP as event-triggered actions

Security

Password: User level password protection
Filtering: By IP address
Encryption: HTTPS, SSH

Environmental Limits

Operating Temperature:
Standard model: -25 to 55°C (-13 to 131°F)
Wide Temp. model: -40 to 70°C (-40 to 158°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Altitude: 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

Standards and Certifications

Safety: UL 60950-1
Rail Traffic: EN 50155 (essential compliance*), EN 45545-2
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
EMI: FCC Part 15, CISPR (EN 55022) class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Shock: IEC 61373
Freefall: IEC 60068-2-32
Vibration: IEC 61373
Vandal Resistance: EN 62262, IK9 level
Fire Protection: EN 45545:2013

MTBF (mean time between failures)

Time: 1,944,687 hrs
Standard: Telcordia TR/SR

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Minimum Viewing System Requirements

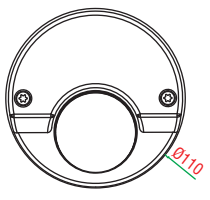
CPU: Pentium 4, 2.4 GHz
Memory: 512 MB of memory
OS: Windows XP/2000 with SP4 or above, Windows Vista, Windows 7
Browser: Internet Explorer 9.x or above
Multimedia: DirectX 9.0c or above

Software Development

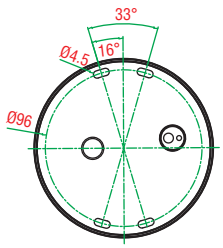
VPort SDK PLUS: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (the latest version of SDK is available for download from Moxa's website).
Standard: ONVIF Profile S

Dimensions

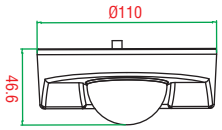
Unit: mm (inch)



Bottom View



Top View



Side View

Ordering Information

Standard Operating Temp. Models -25 to 55°C	Wide Operating Temp. Models -40 to 70°C	Lens Focal Length	Line-In/ Microphone
VPort P06-1MP-M12-CAM25	VPort P06-1MP-M12-CAM25-T	2.5 mm	Line-in
VPort P06-1MP-M12-MIC-CAM25	VPort P06-1MP-M12-MIC-CAM25-T	2.5 mm	Microphone
VPort P06-1MP-M12-CAM36	VPort P06-1MP-M12-CAM36-T	3.6 mm	Line-in
VPort P06-1MP-M12-MIC-CAM36	VPort P06-1MP-M12-MIC-CAM36-T	3.6 mm	Microphone
VPort P06-1MP-M12-CAM42	VPort P06-1MP-M12-CAM42-T	4.2 mm	Line-in
VPort P06-1MP-M12-MIC-CAM42	VPort P06-1MP-M12-MIC-CAM42-T	4.2 mm	Microphone
VPort P06-1MP-M12-CAM60	VPort P06-1MP-M12-CAM60-T	6.0 mm	Line-in
VPort P06-1MP-M12-MIC-CAM60	VPort P06-1MP-M12-MIC-CAM60-T	6.0 mm	Microphone
VPort P06-1MP-M12-CAM80	VPort P06-1MP-M12-CAM80-T	8.0 mm	Line-in
VPort P06-1MP-M12-MIC-CAM80	VPort P06-1MP-M12-MIC-CAM80-T	8.0 mm	Microphone
VPort P06-1MP-M12-CAM25-CT	VPort P06-1MP-M12-CAM25-CT-T	2.5 mm	Line-in
VPort P06-1MP-M12-MIC-CAM25-CT	VPort P06-1MP-M12-MIC-CAM25-CT-T	2.5 mm	Microphone
VPort P06-1MP-M12-CAM36-CT	VPort P06-1MP-M12-CAM36-CT-T	3.6 mm	Line-in
VPort P06-1MP-M12-MIC-CAM36-CT	VPort P06-1MP-M12-MIC-CAM36-CT-T	3.6 mm	Microphone
VPort P06-1MP-M12-CAM42-CT	VPort P06-1MP-M12-CAM42-CT-T	4.2 mm	Line-in
VPort P06-1MP-M12-MIC-CAM42-CT	VPort P06-1MP-M12-MIC-CAM42-CT-T	4.2 mm	Microphone
VPort P06-1MP-M12-CAM60-CT	VPort P06-1MP-M12-CAM60-CT-T	6.0 mm	Line-in
VPort P06-1MP-M12-MIC-CAM60-CT	VPort P06-1MP-M12-MIC-CAM60-CT-T	6.0 mm	Microphone
VPort P06-1MP-M12-CAM80-CT	VPort P06-1MP-M12-CAM80-CT-T	8.0 mm	Line-in
VPort P06-1MP-M12-MIC-CAM80-CT	VPort P06-1MP-M12-MIC-CAM80-CT-T	8.0 mm	Microphone

Package Checklist

- VPort P06-1MP-M12 IP camera
- L-type Torx screwdriver
- 4 indented hexagon head tapping screws, nuts, gaskets and spring washers
- Installation sticker
- Quick installation guide (printed)
- Documentation and software CD
- Warranty card

Optional Accessories (can be purchased separately)

SoftNVR-IA: 64-channel IP surveillance software for industrial automation applications
VP-SCO1: Side-cable-out adapter for mounting the VPort P06-1MP-M12 on a surface
VP-FP1: Fixed plate with threaded screw holes for mounting the VPort P06-1MP-M12 directly over a ceiling aperature

Side-cable-out adapter for surface mounting

VP-SCO1
Dimensions: Ø110 x 17 (H) mm
Material: Plastic
Operating temperature: -30 to 120°C
Weight: 60 g

Plate with threaded screw holes for ceiling mounting

VP-FP1
Dimensions: 110 (L) x 40 (W) mm
Material: Metal
Weight: 40 g

VPort P06HC-1MP-M12 Series

HD video image, square-type IP cameras for mobile surveillance

with front decorative plate

- Compliant with EN 50121-3-2 and essential sections of EN 50155*
- -25 to 55°C operating temperature
- 1/2.7" progressive scan camera with maximum 1280 x 800 resolution at up to 30 frames/second
- Flush mounting for hiding inside a panel, such as a wall or ceiling
- Up to 3 H.264 or MJPEG independent video streams
- DynaStream™ support for maximized network efficiency
- CBR Pro™ support for high image quality in limited bandwidth transmissions
- Supports DHCP Opt 66/67 for auto-configuration
- 1 built-in microphone for audio input, and 1 digital input for external sensor
- ONVIF support for standardization and interoperability

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

DynaStream ONVIF

c UL us LISTED CE FC

Introduction

The VPort P06HC-1MP-M12 square-type IP cameras provide an HD (720P, 1280 x 720) video image, and feature 3 H.264/MJPEG video streams, giving them the versatility and ruggedness to excel in many different installations and environments for IP video surveillance applications. In addition, the cameras comply with a portion of EN 50155 specifications, covering operating temperature, power input voltage, surge, ESD, and vibration, making them suitable for a variety of industrial applications. The cameras feature a -25 to 55°C operating temperature, a rugged M12 Ethernet port, 1 built-in microphone, 1 digital input, PoE power inputs, IP66 rain and dust protection, and a selectable lens.

Specifications

Camera

Sensor: 1/2.7" HD progressive scan CMOS
Lens: 3.6 mm megapixel fixed focal length lens
Angle of View:
• 3.6 mm, F1.6: Diagonal 120°, Horizontal 96°, Vertical 56°
Synchronization: Internal
Minimum Illumination: 0.2 Lux @ F=1.2
White Balance: ATW/AWB
Electronic Shutter: Auto (1/30 to 1/25000 sec)
S/N Ratio: 50 dB (Gamma, Aperture, AGC, OFF; DNR ON)
DNR: Built-in DNR
WDR: Level 1-3, up to 115 dB
AGC Control: 2X, 4X, 8X, 16X
Flickerless Control: Automatic/50 Hz/60 Hz mode
Auto Exposure: Level ±5
Image Rotation: Flip, Mirror, and 180° rotation
Image Setting: Manual tuning with brightness and contrast

Video

Video Compression: H.264 (ISO/IEC 14496-10) or MJPEG
Video Output: Via Ethernet
Video Streams: 3 independent H.264 or MJPEG video streams
• Stream 1: H.264, 1280 x 800 resolution (max.)
• Stream 2: H.264, 720 x 576 resolution (max.)
• Stream 3: MJPEG, 720 x 576 resolution (max.)
Note: Streams 2 and 3 must be set to the same resolution

Video Resolution and FPS (frames per second):

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
CIF	352 x 240	30	352 x 288	25
VGA	640 x 480	30	640 x 480	25
4CIF	704 x 480	30	704 x 576	25
Full D1	720 x 480	30	720 x 576	25
SVGA	800 x 600	30	800 x 600	25
HD	1280 x 720	30	1280 x 720	25
WXGA	1280 x 800	30	1280 x 800	25

Video Viewing:
• DynaStream™ support for automatic frame rate adjustment
• CBR Pro™ for good image quality in limited bandwidth transmission
• 3 privacy mask areas configurable
• Adjustable image size and quality
• Timestamp and text overlay
• OSD (On screen Display) position adjustable
• Maximum of 5 simultaneous unicast connections
• Digital PTZ with 4x zoom

Audio

Audio Inputs: 1, built-in microphone
Audio Format: Mono, PCM (G.711)

Network

Protocols: TCP/IP, UDP, HTTP, SMTP, NTP, DNS, DHCP, UPnP, RTP, RTSP, ICMP, QoS,IGMPv3, SNMPv1/v2c/v3, DDNS, TFTP, ARP, DHCP, OPT66/67
Ethernet: 1 10/100BaseT(X) isolated Ethernet port, 4-pin M12 D-coded female connector

GPIO

Digital Inputs: 1, max. 8 mA, isolated 5-pin M12 connector
High: +13 V to +30 V; Low: -30 V to +3 V

Power Requirements

Input: Power-over-Ethernet (IEEE 802.3af)
Power Consumption: 6 W (max.)

Physical Characteristics

Housing: IP66 metal housing with transparent cover
Dimensions: 109 x 68 x 90 mm (4.29 x 2.68 x 3.54 in)
Weight: 903 g (1.1 lb)
Installation: Flush mounting

Alarms

Intelligent Video: Camera tamper
Video Motion Detection: 3 independently configurable motion areas
Scheduling: Daily repeat timing schedule
Imaging: JPEG snapshots for pre/trigger/post alarm images
Custom Alarms: HTTP event servers for setting customized alarm actions
Email/FTP Messaging: Automatic transfer of stored images via email or FTP as event-triggered actions
Pre-alarm Buffer: 12 MB video buffer for JPEG snapshot images

Security

Password: User level password protection
Filtering: By IP address
Encryption: HTTPS, SSH

Environmental Limits

Operating Temperature: -25 to 55°C (-13 to 131°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Altitude: 2000 m
Conformal Coating: Available on request

Standards and Certifications

Safety: UL 60950-1
Rail Traffic: EN 50155 (essential compliance*), EN 45545-2
EMI: FCC Part 15, CISPR (EN 55022) class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
*Moxa defines “essential compliance” to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
Shock: IEC 61373
Freefall: IEC 60068-2-32
Vibration: IEC 61373
Note: Please check Moxa’s website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Minimum Viewing System Requirements

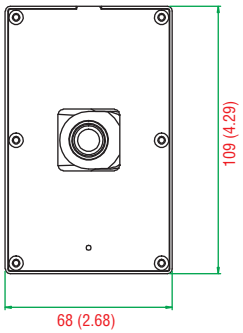
CPU: Pentium 4, 2.4 GHz
Memory: 512 MB of memory
OS: Windows XP/2000 with SP4 or above, Windows Vista, Windows 7
Browser: Internet Explorer 9.x or above
Multimedia: DirectX 9.0c or above

Software Development

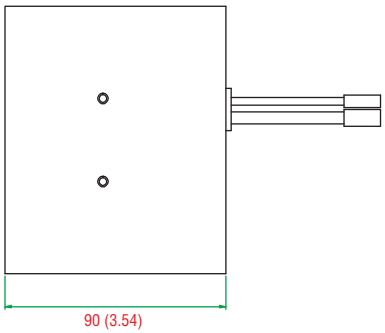
VPort SDK PLUS: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (the latest version of SDK is available for download from Moxa’s website).
Standard: ONVIF

Dimensions

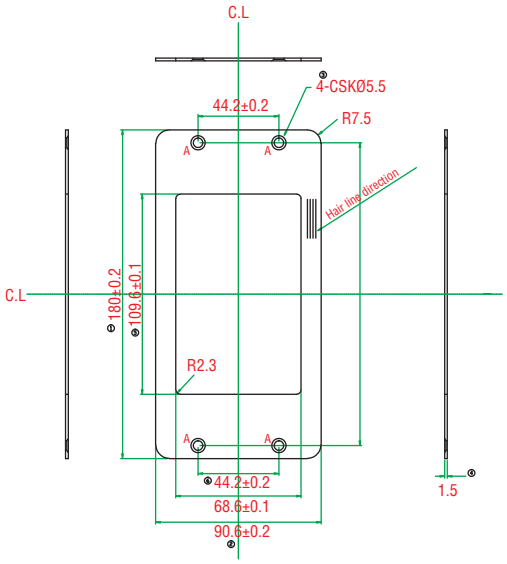
Unit: mm (inch)



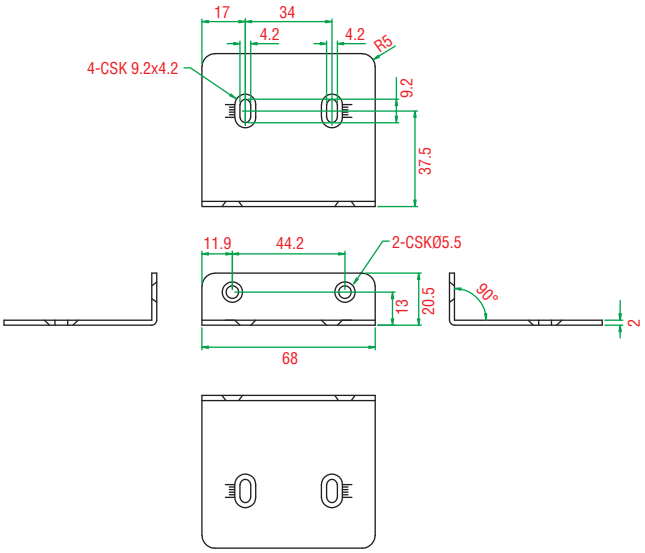
Front View



Side View



Front Decorative Plate



Wall-Mounting Kit

Ordering Information

Available Models

VPort P06HC-1MP-M12-CAM36: EN 50155 compliant, HD, H.264/MJPEG square-type IP camera, 3.6 mm lens, M12 Ethernet connector, PoE, -25 to 55°C operating temperature

Note: Conformal coating available upon request

Optional Accessories (can be purchased separately)

SoftNVR-IA: 64-channel IP surveillance software for industrial automation applications

VP-FD1: Front decorative plate for the VPort P06HC

Package Checklist

- VPort P06HC-1MP-M12 IP camera
- L-type Torx screwdriver
- Dry pack
- Hook fasteners
- 2 L-type installation kits and 4 nylock screws
- Installation stick
- Quick installation guide (printed)
- Documentation and software CD
- Warranty card

VP-IR2

High power IR illuminator for industrial surveillance

- DSI technology
- More than 50% energy savings
- Flexible beam pattern
- Wide application range
- Active/Passive mode for ICR synchronization

Note: The VPort camera should use DC power to accept volt-free relay output from the VP-IR2 series.

Introduction

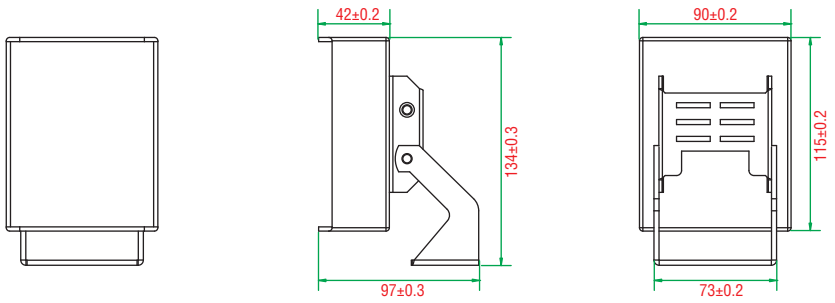
The VP-IR2 series IR illuminator is designed specifically to work with Moxa VPort series IP cameras and PT scanners. The VP-IR2 features high power efficiency and a lower LED life cycle, and is suitable for all types of industrial surveillance applications. The VP-IR2 can be easily mounted on a VPort camera housing or IR bracket available for Moxa PT scanners.

Specifications

Infrared Wavelength	850 nm
Angle	VP-IR22080: 20° VP-IR26080: 60°
IR Effective Range	VP-IR22080: 60 to 100 m VP-IR26080: 20 to 50 m
Active IR On/Off	Controlled by built-in photocell light sensor
Passive IR On/Off	Volt-free relay input
Operating Temperature	-30 to 60°C (-22 to 140°F)
Weatherproofing	IP66
ICR Switching	12 VDC power output
Power Consumption	10 W
Power Requirement	12 VDC

Dimensions

Unit: mm



Front View | Side View | Rear View

Ordering Information

Available Models

VP-IR22080: Infrared LED illuminator, 20°, 850 nm, 12 VDC, illuminates up to 60 to 100 m
VP-IR26080: Infrared LED illuminator, 60°, 850 nm, 12 VDC, illuminates up to 20 to 50 m

Package Checklist

- IR illuminator
- Mounting screws
- Relay wire
- Quick installation guide

Camera Accessories

Box Camera Accessories

IP68 Outdoor Housing

Protects cameras used in outdoor environments

VP-CI701

Construction: Die cast aluminum alloy
Dimensions (D x H x W):
406 x 109 x 171 mm (15.98 x 4.29 x 6.73 in)
View Window: Tempered glass
Housing Style: Clam shell
Latch: Dual-side screw-fastened
Weight: 2.2 kg (4.85 lb)

Wall-Mounting Bracket

For attaching the outdoor housing to a wall

VP-CI800

Construction: Die cast aluminum alloy
Dimensions (D x H x W):
213 x 148 x 80 mm (8.39 x 5.82 x 3.15 in)
Maximum Load: 20 kg (44.2 lb)
Weight: 690 g (1.52 lb)

Pole-Mounting Brackets

For attaching the wall-mounting bracket to a pole

VP-CI815

Construction: Die cast aluminum alloy
Dimensions (D x H x W; each part):
75 x 168.1 x 277.4 mm (2.95 x 6.61 x 10.91 in)
Maximum Load: 30 kg (66.14 lb)
Weight: 2.4 kg (5.29 lb)
Pole Diameter: Ø70 to Ø230 mm (Ø2.76 to Ø9.06 in)

VP-CI820

Construction: Die cast aluminum alloy
Dimensions (D x H x W):
175 x 339.4 x 443.3 mm (6.89 x 13.35 x 17.44 in)
Maximum Load: 30 kg (66.14 lb)
Weight: 3.48 kg (7.67 in)
Pole Diameter: Ø360 mm (Ø14.17 in)
Stainless Straps: 2

Indoor Bracket

For installing a box camera without an outdoor housing

VP-CI803

Construction: Die cast aluminum alloy
Dimensions (Ø x H): 45 x 115 mm (1.77 x 4.53 in)
Maximum Load: 3 kg (6.6 lb)
Weight: 70 g (1.54 lb)

Camera Accessories

Dome Camera Accessories

Wall/Pendant-Mounting Kit

For mounting the VPort 26A to a wall or pendant mount

VP-MK2
Construction: Die cast aluminum alloy
Dimensions (Ø x H):
160 x 69 mm (6.30 x 2.72 in)
Weight: 470 g (1.04 lb)

Wall-Mounting Kit

For mounting a fixed dome camera on the wall

VP-520L
Construction: Die cast aluminum alloy
Dimensions (D x H x W):
210 x 160 x 100 mm (8.27 x 6.30 x 3.94 in)
Weight: 840 g (1.85 lb)

Wall-Mounting Kit

For mounting a PTZ dome camera on the wall

VP-520LB
Construction: Die cast aluminum alloy
Dimensions (D x H x W):
255 x 284 x 204 mm (10.03 x 11.18 x 8.03 in)
Weight: 3.1 kg (6.83 lb)

Pendant-Mounting Kit

For mounting a dome camera on the ceiling

VP-520HB
Construction: Die cast aluminum alloy
Dimensions (D x H x W):
244 x 150 x 204 mm (9.61 x 5.91 x 8.03 in)
Straight tube: 300 mm (11.81 in)
Weight: 2.7 kg (5.96 lb)

Pole/Corner-Mounting Kit (for the VP-520L)

For mounting a dome camera on a pole or in a corner (used with the VP-520L)

VP-CPM
Construction: Die cast aluminum alloy
Dimensions (D x H x W):
86.8 x 126 x 156.6 mm (3.42 x 4.96 x 6.16 in)
Weight: 440 g (0.97 lb)
Stainless Straps: 2

Pole-Mounting Kit (for the VP-520LB)

For mounting a dome camera on a pole (used with the VP-520LB)

VP-510CPM
Construction: Die cast aluminum alloy
Dimensions (D x H x W):
182 x 91 x 275 mm (7.17 x 3.58 x 10.79 in)
Weight: 500 g (1.1 lb)
Stainless Straps: 2

Sunshield (for the VPort 66-2MP)

For protecting the dome camera from direct sunlight

VP-SH1
Construction: Die cast aluminum alloy
Dimensions (Ø x H):
236 x 180 mm (9.29 x 7.09 in)
Weight: 500 g (1.1 lb)

Flush-Mounting Kit (for the VPort P16)

For flush mounting the VPort P16 camera on the ceiling

VP-FMK1
Construction: Die cast aluminum alloy
Dimensions (D x H x W):
129.4 x 52.4 x 194 mm (5.08 x 2.06 x 7.64 in)
Cover plate: Ø210 mm (Ø 8.27 in)
Weight: 410 g (0.9 lb)

VPort 461A Series

Superior video performance, 1-channel H.264/MJPEG industrial video encoders

- Supports up to 3 video streams simultaneously for H.264 and MJPEG
- Up to Full D1 resolution (720 x 480) @ 90 FPS for 3 video streams with legacy analog video images
- Video latency under 200 ms
- 2 Ethernet ports for cascade and Ethernet port redundancy
- Moxa DynaStream™ function support for network efficiency
- ONVIF support for standardization and interoperability
- Local storage capability with SD card slot
- Industrial design with -40 to 75°C operating temperature

Introduction

The VPort 461A 1-channel industrial video encoder with H.264 video compression algorithm provides the best video quality on the market, but with a smaller bandwidth requirement than other video compression standards. In addition, to meet various video stream requirements, the VPort 461A can provide up to 3 video streams simultaneously using H.264 and MJPEG compression formats. Video streams can be used for different purposes, such as viewing, recording, and analysis. In addition, the rugged industrial design, which includes a -40 to 75°C operating temperature, IP30 protection, and industrial certifications, make the VPort 461A suitable for harsh environments.

The VPort 461A is equipped with Moxa's innovative DynaStream™ technology, which allows you to change the video frame rate automatically. With DynaStream™, you can control your network bandwidth budget and simplify network system management. The CBR Pro™ function guarantees the lowest packet loss for limited bandwidth transmissions to ensure that images will not exhibit the mosaic effect.

Specifications

Video

Video Compression: H.264 (MPEG4 part 10), MJPEG
Video Inputs: 1 (BNC connector)
Video Outputs: Over Ethernet
Video Streams: 3, H.264 or MJPEG video streams
NTSC/PAL: Auto-sensing or manual
Video Resolution and FPS (frames per second):

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
QCIF	176 x 112	30	176 x 144	25
CIF	352 x 240	30	352 x 288	25
VGA	640 x 480	30	640 x 480	25
4CIF	704 x 480	30	704 x 576	25
Full D1	720 x 480	30	720 x 576	25

Video Viewing:
• DynaStream™ support for changing the video frame rate automatically
• Adjustable image size and quality
• Timestamp and text overlay
• Maximum of 10 simultaneous unicast connections, 50 multicast clients
• CBR Pro™ support for accurate streaming bit rate control
• Image manipulation: 180° rotation
• Image tuning: control brightness, contrast, saturation

Audio

Audio Inputs: 1 Line-in or mic-in with 3.5 mm phone jack
Audio Outputs: 1 Line-out with 3.5 mm phone jack
Audio Format: Mono, PCM (G.711)

Network

Protocols: IPv4/v6, UDP, HTTP, SMTP, FTP, NTP, DNS, DHCP, UPnP, RTP, RTSP, ICMP, IGMPv3, QoS (ToS), SNMP V3, DDNS, Modbus/TCP, 802.1X, SSH/HTTPS
Ethernet: 2 10/100BaseT(X) Ethernet ports, RJ45 connector

Serial Port

PTZ Ports: 1 RS-232 or RS-422/485 port, terminal block connector, 115.2 kbps
COM Ports: 1 RS-232 or 485 port, DB9 male connector, 115.2 kbps
Console Port: 1 RS-232 port, RJ45 connector

Local Storage

SD Socket: Standard SD socket, V2.0 (SDHC)

GPIO

Digital Inputs: 2, max. 8 mA
High: +13 to +30 V; Low: -30 to +3 V
Relay Outputs: 2, max. 24 VDC @ 1 A

LED Indicators

STAT: Indicates if system is booted up properly or not
PWR1: Power 1
PWR2: Power 2
FAULT: Can be configured to correspond to system alarm, power failure, or disconnected network
VIDEO: Video input signal
PTZ: Indicates if PTZ or COM port data has been transmitted
SD: Indicates if SD card was mounted successfully

Power Requirements

Input Voltage: 12 to 32 VDC, or 18 to 30 VAC
Input Current: 0.85 A @ 12 VDC; 0.3 A @ 32 VDC; 0.85 A @ 18 VAC; 0.56 A @ 30 VAC

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 46 x 134 x 105 mm (1.81 x 5.31 x 4.13 in)
Weight: 710 g (1.57 lb), including DIN-rail mounting kit
Installation: DIN-rail mounting (standard), wall mounting (optional)

Alarms

Intelligent Video: Camera tampering
Video Motion Detection: Includes sensitivity tuning
Scheduling: Daily repeat timing schedule
Imaging: JPEG snapshots for pre/trigger/post alarm images

Custom Alarms: HTTP event servers and CGI events for setting customized alarm actions
Email/FTP Messaging: Automatic transfer of stored images via email or FTP with event-triggered actions
Pre-alarm Buffer: 50 MB for JPEG snapshot images

PAN/TILT/ZOOM

PTZ Camera Control: Via PTZ port or COM port
PTZ Control Functions: PAN, TILT, ZOOM, FOCUS, moving speed, preset position (max. 128 positions)
PTZ Function Updates: Driver upload supported
Supported Device Protocols: Pelco D, Pelco P, Custom Camera

Security

Password: User level password protection
Filtering: By IP address
Authentication: 802.1X
Encryption: HTTPS, SSH

Environmental Limits

Operating Temperature:
Standard Models: -25 to 60°C (-13 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Vibration:
IEC 60068-2-6, 2 to 13.2 Hz: 2 mm (peak-peak); 13.2 to 100 Hz: 0.7g; 1.50 hrs/axis
IEC 60068-2-6, 3 to 9 Hz: 7 mm (peak-peak); 9 to 150 Hz: 1.0g; 1.86 hrs/axis
Shock: IEC 60068-2-27, 20g/11ms
Altitude: 2000 m
Ingress Protection: IEC 60529, IP30

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
IEC 61000-4-11
Transportation: NEMA TS2

MTBF (mean time between failures)

Time: 647,088 hrs
Standard: Telcordia SR332

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Minimum Viewing System Requirements

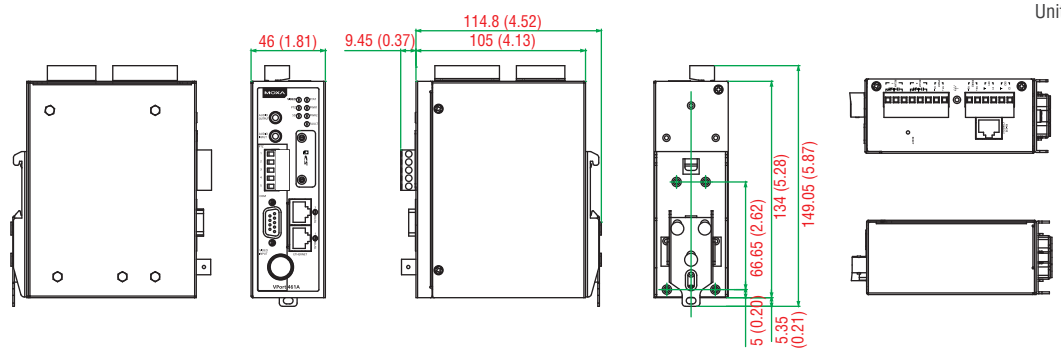
CPU: Pentium 4, 2.4 GHz or above
Memory: 512 MB memory or above
OS: Windows XP/2000 with SP4 or above, Windows Vista, Windows 7
Browser: Internet Explorer 9.x or above
Multimedia: DirectX 9.0c or above

Software Development

VPort SDK PLUS: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (the latest version of SDK is available for download from Moxa's website).
Standard: ONVIF, Profile S

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | Top/Bottom Views

Ordering Information

Available Models

VPort 461A: 1-channel H.264/MJPEG industrial video encoder with 2 10/100BaseT(X) ports, -25 to 60°C operating temperature
VPort 461A-T: 1-channel H.264/MJPEG industrial video encoder with 2 10/100BaseT(X) ports, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

SoftNVR-IA: 64-channel IP surveillance software for industrial automation applications
DR-4524/75-24/120-24: 45/75/120 W DIN-rail 24 VDC power supplies
DR-4524: 45W/2A, 24 VDC power supply, with universal 85 to 264 VAC input
DR-75-24: 75W/3.2A, 24 VDC power supply, with universal 85 to 264 VAC input
DR-120-24: 120W/5A, 24 VDC power supply, with 88 to 132 VAC/176 to 264 VAC input by switch
MDR-40-24/60-24: 40/60 W DIN-rail 24 VDC power supplies, -20 to 70°C operating temperature
MDR-40-24: 40W/1.7A DIN-rail 24 VDC power supply with universal 85 to 264 VAC input, -20 to 70°C operating temperature
MDR-60-24: 60W/2.5A DIN-rail 24 VDC power supply with universal 85 to 264 VAC input, -20 to 70°C operating temperature
WK-46: Wall-mounting kit
RK-4U: 19-inch rackmount set

Package Checklist

- VPort 461A video encoder
- 6-pin terminal block for 1 power input and 2 digital inputs
- 8-pin terminal block for the other power input and 2 relay outputs
- 5-pin terminal block for the RS-232/422/RS-485 PTZ control port
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

VPort 364A Series

Superior video performance, 4-channel H.264/MJPEG industrial video encoders

- Dual simultaneous H.264 and MJPEG video streams
- Video latency under 200 ms
- Moxa DynaStream™ function support for network efficiency
- ONVIF support for standardization and interoperability
- 802.1X and SSL/SSH for advanced network security
- Industrial design with -40 to 75°C operating temperature
- VPort SDK PLUS provided free

Introduction

The VPort 364A 4-channel industrial video encoder with H.264 video compression algorithm provides the best video quality on the market, but with a smaller bandwidth requirement than other video compression standards. In addition, to meet various video stream requirements, the VPort 364A supports dual video streams using H.264 and MJPEG compression formats. The two video streams can be used for different purposes, such as viewing, recording, and analysis. In addition, the rugged industrial design, which includes a -40 to 75°C operating temperature range, IP30 form factor protection, and industrial certifications, make the VPort 364A highly suitable for use in harsh environments.

Specifications

Video

Video Compression: H.264 (MPEG4 part 10, AVC) or MJPEG
Video Inputs: 4, BNC connector (1.0 Vpp, 75 ohm)
Video Streams: Dual streams (one for H.264, the other for MJPEG)
NTSC/PAL: Manual
Video Viewing:
• DynaStream™ support for changing the video frame rate automatically
• Adjustable image size and quality
• Timestamp and text overlay
Video Resolution and FPS (frames per second) in single video stream:

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
QCIF	176 x 112	30	176 x 144	25
CIF	352 x 240	30	352 x 288	25
VGA	640 x 480	30	640 x 480	25
4CIF	704 x 480	30	704 x 576	25
Full D1	720 x 480	30	720 x 576	25

Audio

Audio Inputs: 1, Line-in or mic-in with RCA connector
Audio Outputs: 1, Line-out with RCA connector
Audio Format: Mono, PCM

Network

Protocols: TCP, UDP, HTTP, SMTP, FTP, NTP, DNS, DHCP, UPnP, RTP, RTSP, ICMP, IGMPv3, QoS, SNMPv1/v2c/v3, DDNS, Modbus/TCP
Ethernet: 1 10/100BaseT(X) auto negotiating RJ45 port, or 1 100BaseFX fiber port (single/multi-mode, SC connector)

Serial Port

PTZ Ports: 1, RS-232/422/485 port (5-pin terminal block connector), max. speed of 115.2 Kbps
Console Port: 1, RS-232 RJ45 port

GPIO

Digital Inputs: 4, max. 8 mA
High: +13 V to +30 V; Low: -30 V to +3 V
Relay Outputs: 2, max. 24 VDC @ 1 A

LED Indicators

STAT: System status
PWR1: Power 1
PWR2: Power 2
FAULT: Can be configured to correspond to system alarm, power failure, or disconnected network
V1, V2, V3, V4: Video input signal activity for channels 1 to 4

Power Requirements

Input Voltage: 2 redundant power inputs, 12 to 32 VDC or 18 to 30 VAC, terminal block connector
Input Current: 12 to 32 VDC, 0.7 A (max.) or 18 to 30 VAC, 0.68 A (max.)
Power Consumption: 7.5 W (max.)

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 80.2 x 135 x 105 mm (3.16 x 5.31 x 4.13 in)
Weight: 1.13 kg (2.49 lb)
Installation: DIN-rail mounting (standard), wall mounting (optional)

Alarms

Video Motion Detection: Includes sensitivity tuning
Video Loss: Video loss alarm
Scheduling: Daily repeat timing schedule
Imaging: JPEG snapshots for pre/trigger/post alarm images
Custom Alarms: HTTP event servers and CGI events for setting customized alarm actions
Email/FTP Messaging: Automatic transfer of stored images via email or FTP with event-triggered actions
Pre-alarm Buffer: 24 MB per channel for JPEG snapshot images

PAN/TILT/ZOOM

PTZ Camera Control: Via RS-232/422/485 PTZ port
PTZ Control Functions: PAN, TILT, ZOOM, FOCUS, moving speed, preset position (max. 25 positions), and 24 custom commands
PTZ Function Updates: Driver upload supported
Supported Device Protocols: Pelco D, Pelco P, Dynacolor DynaDome, Cohu, Custom Camera
Transparent PTZ Control: Control PTZ cameras with legacy PTZ control panel or keyboard connected to a PC or VPort decoder

Security

Password: User level password protection
Filtering: By IP address

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Vibration:
IEC 60068-2-6, 2 to 13.2 Hz: 2 mm (peak-peak); 13.2 to 100 Hz: 0.7g; 1.50 hrs/axis
IEC 60068-2-6, 3 to 9 Hz: 7 mm (peak-peak); 9 to 150 Hz: 1.0g; 1.86 hrs/axis
Shock: IEC 60068-2-27, 20g/11ms
Altitude: 2000 m
Ingress Protection: IEC 60529, IP30

Standards and Certifications

Safety: UL 60950-1
EMI: CISPR 22, FCC Part 15B Class A
EMS:
EC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8

MTBF (mean time between failures)

Time: 465,000 hrs
Standard: Telcordia SR332

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Minimum Viewing System Requirements

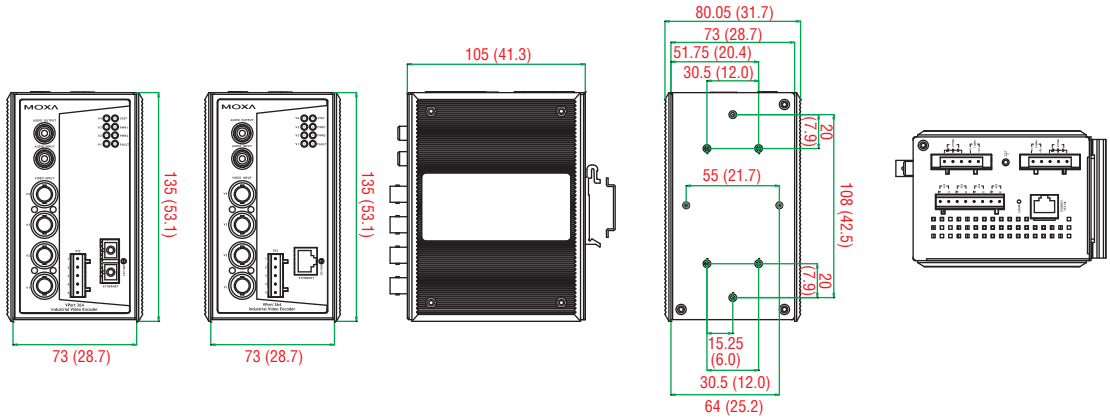
CPU: Pentium 4, 2.4 GHz or above
Memory: 512 MB memory or above
OS: Windows XP/2000 with SP4 or above, Windows Vista, Windows 7
Browser: Internet Explorer 9.x or above
Multimedia: DirectX 9.0c or above

Software Development

VPort SDK PLUS: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (the latest version of SDK is available for download from Moxa's website).
Standard: ONVIF

Dimensions

Unit: mm (inch)



Front Views | Side View | Rear View | Top View

Ordering Information

Available Models		Port Interface		
Standard Temp. Range (0 to 60°C)	Wide Temp. Range (-40 to 75°C)	10/100/1000 BaseT(X)	Multi-mode, SC Connector	Single-mode, SC Connector
VPort 364A	VPort 364A-T	1	–	–
VPort 364A-M-SC	VPort 364A-M-SC-T	–	1	–
VPort 364A-S-SC	VPort 364A-S-SC-T	–	–	1

Package Checklist

- VPort 364A video encoder
- 2 5-pin terminal blocks for 2 power inputs and 2 relay outputs
- 1 8-pin terminal block for 4 DIs
- 1 5-pin terminal block for the RS-232/422/485 PTZ control port
- Quick installation guide (printed)
- Documentation and software CD
- Warranty card

Optional Accessories (can be purchased separately)

SoftNVR-IA: 64-channel IP surveillance software for industrial automation applications
DR-4524: 45W/2A, 24 VDC power supply, with universal 85 to 264 VAC input
DR-75-24: 75W/3.2A, 24 VDC power supply, with universal 85 to 264 VAC input
DR-120-24: 120W/5A, 24 VDC power supply, with 88 to 132 VAC/176 to 264 VAC input by switch
MDR-40-24: 40W/1.7A DIN-rail 24 VDC power supply with universal 85 to 264 VAC input, -20 to 70°C operating temperature
MDR-60-24: 60W/2.5A DIN-rail 24 VDC power supply with universal 85 to 264 VAC input, -20 to 70°C operating temperature
WK-46: Wall-mounting kit
RK-4U: 19-inch rackmount set

MXNVR-RO-T

Preliminary

Industrial network video recorder for harsh environments

- Compliant with EN 50121-3-2 and essential sections* of EN 50155
- -40 to 70°C (TX temperature) operating temperature range, without a fan
- Record 1080P (1920 x 1080) images at up to 900 FPS
- Live view of 1080P (1920 x 1080) images at up to 120 FPS
- Multi-channel live view in 1/4 layout
- Redundant video recording
- Two built-in hot-swappable storage trays for 2.5” SSDs or HDDs
- ONVIF support for standardization and interoperability

*Moxa defines “essential compliance” to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

c UL us LISTED EN 50155 CE FC

Introduction

The MXNVR-RO-T is an onboard NVR (network video recorder) specially designed for live viewing and recording video on trains. It is compliant with essential sections of EN 50155 (performance, TX temperature, shock vibration, and EN 50121-3-2 EMC), which allows the onboard CCTV system to keep operating in critical onboard environments (requires solid-state disks that supports -40 to 70°C operating temperatures). The MXNVR-RO-T can record 1080P (1920 x 1080) images at up to 900 FPS, and supports live view of 1080P images at up to 120 FPS. The user interface is compatible with a touch panel, and is designed for use by train engineers and operators.

Specifications

Recording

Recoding Capability: Record 1080P (1920 x 1080) images at up to 900 FPS
Record Modes: Continuous, Schedule, Event
Stream Types: Video, Audio, Video/Audio
Video Input: IP video via Ethernet
Video Codecs: H.264, MPEG4, MJPEG
Audio Input/Output: 1 line-in, 1 line-out, M12 connector
Audio Format: PCM (G.711), AAC
Event Record: Triggered by CGI/DI digital input, motion detection, or time period
Pre/Post Record: 1 to 600 seconds (can be exported as a single video file)
Recycling Record: Enable/ Disable

Local Live View

Display Capability: Display 1080P (1920 x 1080) images at up to 120 FPS
Display Mode: 1/4 multi-channel layout
Display Sequence: Based on a multi-channel layout
Monitor Interfaces: 2, 1 VGA DB15 female connector, 1 DVI-D connector
Snapshot Images: Save snapshot images to JPEG/PNG format

Searching and Exporting

Search Modes: Camera, date/time, event
Exporting: Export (download) recorded video files remotely by file or time period
Exporting File Formats: MP4
Authentication: Export recoded video files with watermark

Playback

Method: Export (download) video files for playback
Playback Modes: Continuous, timeline
Playback Operation: Play, Pause, Stop, Fast Forward, Fast Rewind

Storage

Disk Interface: 2 hot-swappable 2.5” SATAII sockets
Note: Storage disks are not included. Users will need to purchase 2.5” hard disks or SSDs (solid state disks) from a hard disk vendor.

Display Interface

VGA Interface: DB15 female connector, 2048 x 1536 resolution (max.)
DVI Interface: DVI-D connector (Chrontel CH7307 SDVO to DVI transmitter), 1920 x 1200 resolution (max.)

Network

Ethernet: 2 auto-sensing 10/100/1000 Mbps ports (M12 X-coded)
Network Configuration: IP address, subnet mask, gateway, DNS servers

Digital Input

Input Channels: 6, source type
Input Voltage: 0 to 30 VDC at 25 Hz
Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open
Digital Input Levels for Wet Contacts:
• Logic level 0: +3 V max.
• Logic level 1: +10 V to +30 V (Source to DI)
Isolation Protection: 3 kV

Digital Output

Output Channels: 2, sink type
Output Current: 200 mA (max.) per channel
On-State Voltage: 24 VDC nominal, open collector to 30 VDC
Connector Type: 10-pin screw-fastened terminal block (6 DI points, 2 DO points, DI Source, GND)
Isolation: 3 kV optical isolation

LED Indicators

System: Power x 1, Storage x 1
LAN: 100M/Link x 2, 1000M/Link x 2
Serial: TX x 2, RX x 2

Power Requirements

Input Voltage: 24 to 110 VDC, M12 connector
Input Current: 2.5 A @ 24 VDC to 0.55 A @ 110 VDC (without SSD/HDD attached)
Power Consumption: 60 W (without SSD/HDD attached)

Physical Characteristics

Housing: Aluminum
Dimensions: 287 x 290 x 101 mm (11.29 x 11.41 x 3.97 in)
Weight: 5 kg (11.02 lb)
Installation: Wall mounting (standard)

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 60950-1, CSA C22.2 No. 60950-1-07, EN 60950-1
Rail Traffic: EN 50155 (essential compliance*), EN 50121-3-2, EN 50121-4, IEC 61373
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

Time: 261,297 hrs
Standard: Telcordia SR332

Warranty

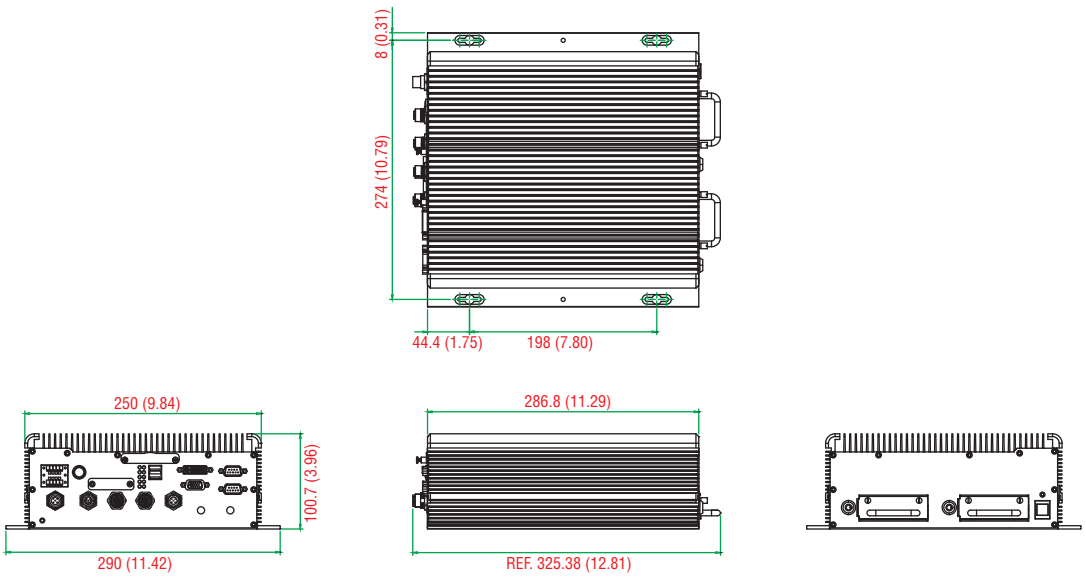
Warranty Period: 3 years
Details: See www.moxa.com/warranty

Minimum Viewing System Requirements

Note: These specifications describe the network video recorder itself, but not its official accessories. In particular, the wide temperature range supported by this product does not apply to accessories such as power adapters and cables.

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

MXNVR-RO-T: Onboard NVR, x86 embedded computer with Intel Core i7-3517UE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, Windows Embedded Standard 7, -40 to 70°C operating temperature (EN 50155 Class TX)

Package Checklist

- MXNVR-RO-T NVR
- 2 storage tray keys
- Power cable (CBL-M12FF5PPJ21-BK-15-IP68)
- 2 5-pin terminal blocks
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

Type		Model	Description
Ethernet			
	Cable & Connector	CBL-M12XMM8PRJ45-BK-100-IP67	1-meter X-coded M12-to-RJ45 Cat-5E UTP gigabit Ethernet cable, 8-pin male M12 connector, IP67-rated
	Connector	M12X-8PMM-IP67	Field-installable X-coded screw-fastened gigabit Ethernet connector, 8-pin male M12 connector, IP67-rated
Power			
	Connector	M12A-5P-IP68	Field-installable A-coded screw-fastened power connector, 5-pin female M12 connector, IP68-rated
	Power Adapter	PWR-24250-DT-S1	Input: 100 to 240 VAC, 50 to 60 Hz, 1.5 A Output: 24 VDC, 2.5 A, 60 W, for testing and system development in the office under ambient temperature conditions
	Power Cord	PWC-C7US-2B-183	Power cord with 2-pin connector, US plug
	Power Cord	PWC-C7EU-2B-183	Power cord with 2-pin connector, EU plug
	Power Cord	PWC-C7UK-2B-183	Power cord with 2-pin connector, UK plug
	Power Cord	PWC-C7AU-2B-183	Power cord with 2-pin connector, AU plug
	Power Cord	PWC-C7CN-2B-183	Power cord with 2-pin connector, CN plug
Audio			
	Connector	M12A-8PMM-IP67	Field-installable A-coded 8-pin male screw-fastened M12 connector, IP67-rated
USB			
	Connector	M12A-5PMM-IP68	D-coded screw-fastened USB connector, 5-pin male M12 connector, IP68-rated

SoftNVR-IA

64-channel IP video surveillance software designed for industrial automation systems

- Up to 64 channels in one system
- Built-in OPC server for easy communication with automation systems
- Live view with H.264, MPEG4, and MJPEG, from VPort products
- Dual-monitor display capability
- i-frame (key frame) decode only to save system resources for higher priority tasks
- Video recording with manual, event-triggered, and scheduled recording
- Playback system with event and time-based search functionality
- Supports remote live view and remote playback via web access
- Video watermark verification and fail-over system design

Introduction

The SoftNVR-IA 64-channel IP surveillance software is designed for use with industrial applications. One of the key features of SoftNVR-IA is a built-in OPC server, which can communicate directly with industrial automation systems (SCADA, HMI, etc.). To enhance system intelligence, video recording and alarms can be triggered by events such as Digital Input and Video Loss that are supported by SoftNVR-IA, as well as events in automation systems. Most importantly, SoftNVR-IA gives industrial system integrators unlimited capability for integrating IP surveillance systems with automation systems.

OPC Communication

- Can receive event tags sent from the automation system to trigger video recording and other actions
- Can send event tags to the automation system with system information and the status of each channel

Live View

- Supports 1, 4, 6, 9, 10, 13, 16, 25, 32, 64 live display
- Supports MJPEG, MPEG4, and H.264 video streams (for VPort products only)
- Supports up to 64 channels in the camera list
- Easy-to-use with drag and drop video display selection
- Can provide snapshot images in JPEG format
- Supports image tuning, including brightness, saturation, contrast, and hue
- Supports 2-way audio for voice communication between field sites and the control center
- Supports dual monitor and full screen display
- Supports display screen rotation
- Supports the PTZ control panel defined in VPort products
- Supports PTZ patrol
- Supports i-frame (key frame) decode only, which lowers displayed frame rate immediately to save system resources for other higher priority tasks

Dual monitor display

Video Recording

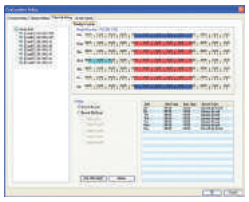
- Video recording can be triggered manually or by event
- Video files are in AVI format, and can be played back on all popular media players
- The storage hard disk can be selected from network hard drives
- Supports the FIFO recycle function for long time video recording
- Can configure the number of days recorded video files will be stored
- Supports pre-event video recording for up to 30 seconds

Playback & Search

- Can play back up to 4 recorded videos simultaneously
- Supports timeline selection when in video playback mode
- Supports stop, speed up, slow down, rewind frame-by-frame, and forward frame-by-frame
- Search video records by camera, time, or event
- Can take snapshot images when in video playback mode

Schedule

- Can set up a weekday schedule
- Schedule settings can be based on camera and event

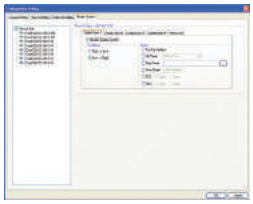


e-Map

- Can load BMP emap for easy camera location identification
- Maximum of 32 emaps can be listed
- Supports video image popups when hovering over camera icon
- Select 3 camera icon types and up to 8 lens directions
- Access live display by double clicking camera icon
- Camera icon can be configured to flash when alarm event occurs

Alarm Events

- Alarm events: Digital Input and Video Loss
- Can accept events from the automation system via OPC communication
- Alarm triggered actions: popup display, go preset, play sound, trigger DO (relay)



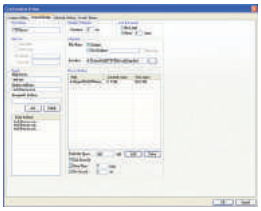
Remote Access

- Remote live view via web access
- Remote playback of recorded video via web access
- Capable of searching a specified recorded video by event, time, and camera
- Remote control of PTZ camera

System

- Automatically search or manually detect the IP address of a video device on the LAN
- Can configure the server name
- Can configure multiple email addresses for receiving alarm messages

- Folder and file names of snapshot images can be customized
- Up to 4 groups and 32 user privileges for different operational purposes
- Supports English, Traditional Chinese, and Simplified Chinese



Recommended System Requirements

- Intel Core i7-2600 CPU @ 3.40 GHz (4 CPUs) or above
- 4 GB RAM or above
- Windows XP with SP3, Windows 7
- Motherboard: Intel chipset recommended
- Display card: ATI Radeon 9200, nVIDIA GeForce GT220, or above (dual monitors require 2 outputs); 1 GB DDR3 recommended

Ordering Information

Available Models

SoftNVR-IA: 64-channel IP video surveillance software for industrial automation systems

Package Checklist

- SoftNVR-IA CD (includes the SoftNVR-IA software and related documents)
- Key Pro (plugs into the USB port)
- Quick installation guide (printed)

VPort SDK PLUS

User-friendly software development kits for third-party developers to customize IP video management systems

Introduction

Moxa IVN (Industrial Video Networking) solutions, which include VPort series IP video products and IP surveillance software solutions, are future-proof, ready-to-use IP video solutions for video surveillance applications. With the growing popularity of IP networks, more and more users need to integrate their video management system with other monitoring and control systems (e.g., SCADA or HMI) to get the benefits of centralization and inter-operation. To assist third-party developers with this intergration, we are providing Moxa VPort SDK PLUS, which supports VPort series video server and IP cameras, for building customized video management systems and for integrating VPort series products into comprehensive monitoring and control systems.

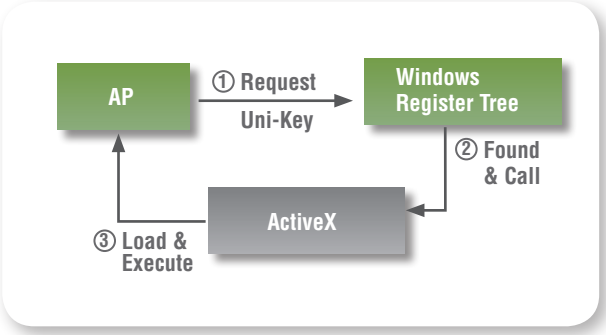
URL (CGI) Commands

URL commands are easy-to-use CGI commands used with HTML programming for web systems. Users can acquire video images and control VPort series products from their own customized web pages by embedding these CGI commands into the HTML source code. All of the URL commands are listed in the VPort user's manual, or a CGI command manual.

ActiveX Control SDK PLUS

ActiveX Control is an OCX component that uses Microsoft COM (Component Object Model) technology to enable software components to communicate. ActiveX Control is used widely with platforms that support WIN32, IE Plug-in, and Visual Basic, and is also popular in automation system software, such as SCADA systems. Moxa ActiveX Control SDK PLUS is a user-friendly, customized tool for programmers that supports versatile parameters for customized viewing, recording, PTZ camera control, event triggering, and recorded video playback. Moxa ActiveX Control SDK PLUS is provided free of charge, and supports VB, VC, and C# developing environments, as well as plug-ins for web applications and automation tools (e.g., SCADA software). Third-party developers who want to use ActiveX SDK can download it from Moxa's website.

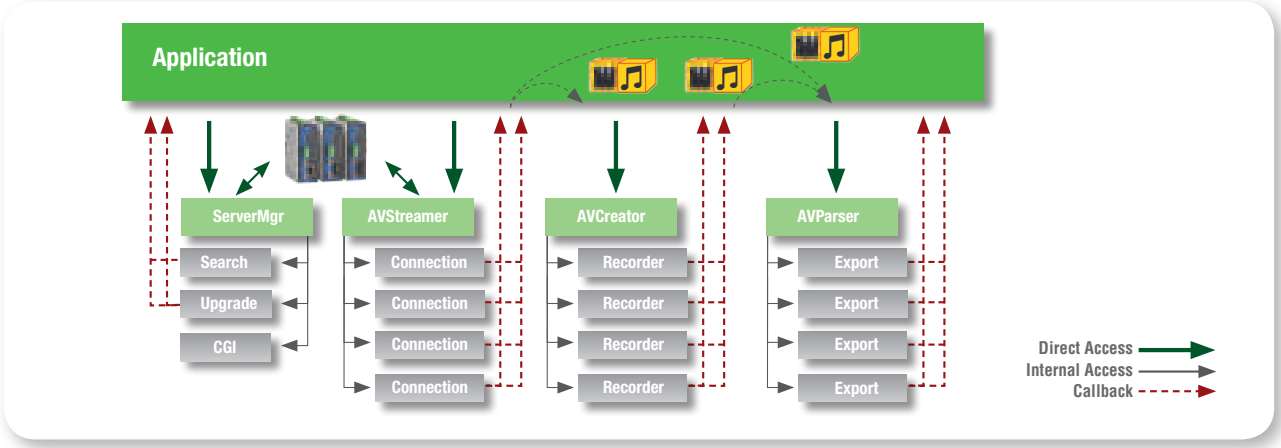
ActiveX Work Process



API SDK PLUS

For some video management applications, ActiveX Control SDK PLUS may not provide users with enough functionality. In this case, API SDK PLUS, which includes a detailed C library, can be used to program customized solutions in a Visual C++ or C# environment. API SDK PLUS includes a total of 4 DLL modules, and currently supports the WIN32, Linux, and WIN CE pocket 2003 platforms. API SDK PLUS is provided free of charge. However, since API SDK PLUS uses proprietary technology and the programmer must be an experienced, professional C programmer, we are not releasing API SDK PLUS for general use. Third-party developers who would like to use API SDK PLUS should request support on Moxa's website to apply for a free copy. Some verification is required.

API Module Structure



VPort Video Gadget

Coding-free programming method specially designed for SCADA systems

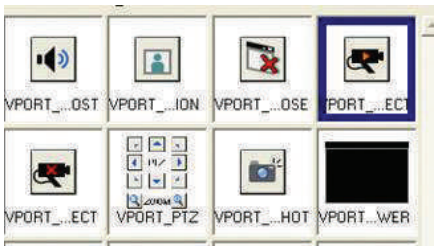
Introduction

Embedding video into a SCADA system has always been a big hassle for system integrators, since they needed to invest the time and effort to study the IP video device's ActiveX SDK (software development kit), and then struggle to write bug-free code. In order to reduce the amount of programming effort required, Moxa has created a coding-free programming tool, called VPort Video Gadget, which is included with VPort ActiveX SDK PLUS. VPort Video Gadget has the potential to save system engineers an enormous amount of programming time and effort.

About VPort Video Gadget

VPort Video Gadget is basically a collection of pre-programmed function objects for embedding video into a SCADA system. Functions include connecting/disconnecting the VPort, displaying a video, closing a video, controlling PTZ, enabling/disabling audio, and taking snapshot images. There is no need for the system engineer to spend time writing the code, which is a huge benefit since it can save a lot of time and engineering resources.

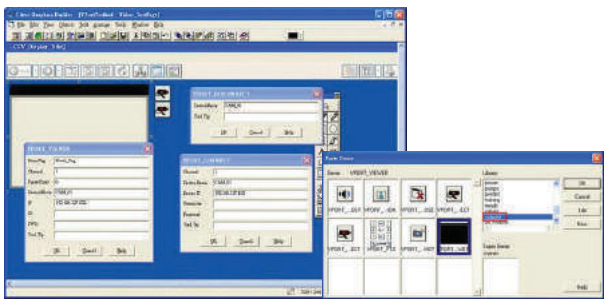
For videos recorded with Moxa SoftNVR-IA or MxNVR-IA, VPort video gadget provides a remote playback function object for playing recorded videos on a SCADA HMI. The SCADA system integrator can easily design the search and playback of recorded videos using this remote playback function.



Using VPort Video Gadget

Only a few steps are required to use VPort Video Gadget:

- Drag & drop the selected function object
- Input the required parameters into the appropriate columns
- Save, and the function programming task is done
- Supports Citect, InTouch, and Cimplicity third-party SCADA systems



Note: The precise way to use VPort Video Gadget may be different for different SCADA systems. However, regardless of which SCADA system you use, VPort Video Gadget is 100% coding-free.

A Great Tool for Automation Systems

Obviously, the key benefit provided by VPort Video Gadget is to greatly reduce the amount of programming effort required to integrate IP video into SCADA software. But more than that, with VPort Video Gadget your IP video system will no longer be separate from your automation system. Instead, it will just be one more element of the automation system, on the same par as I/O sensor alarms, motors, and other items.

To get VPort Video Gadget, download Moxa VPort ActiveX SDK PLUS from the download center on Moxa's website.

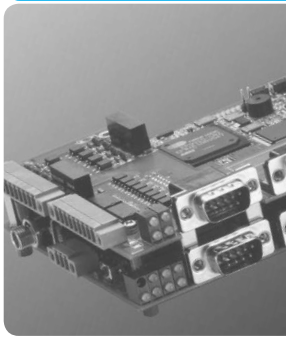
Embedded Computers

Rcore Software

Ready-to-Run Rcore Software Platform 20-2

20

Embedded Computers



Ready-to-Run Rcore Software Platform

Take advantage of Moxa's Rcore platform to increase your competitiveness and ensure a faster time-to-market. The Rcore platform provides the following hard-to-beat benefits:

- Easy-to-use application libraries
- Proven and bug-free sample code
- Consulting-level advice for application development
- Fast concept validation and development cycle

BIOS and Boot Loader

Moxa provides full-featured BIOS and boot loader solutions for both x86-based and RISC-based systems. The wide range of options and extensions provide an answer to any potential need. Key features include:

BIOS

- Power failure recovery
- LVDS innovation: various resolutions supported (up to 64 options)
- Dynamic throttling technology
- Remote system wake-up
- Remote LAN boot
- Wide compatibility with peripheral devices
- Secure software protocols
- Fast boot
- BIOS code customization and consulting
- Secure pen drive boot

Boot Loader

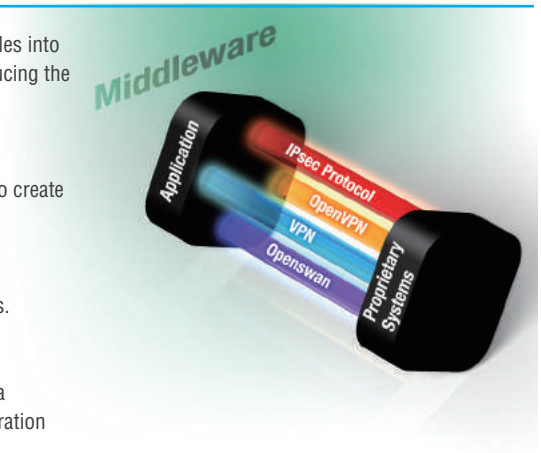
- External disk boot option
- MDM remote management tool to remotely update firmware or for system recovery
- Fast boot
- Boot loader customization and consulting

Operating Systems

Moxa's x86 and RISC-based embedded computers offer a powerful computing environment and stable system for a variety of industrial applications. These computers use either a Linux or Windows embedded operating system to provide programmers around the world with a user-friendly environment for application development, and help reduce the effort required for system integration. Moxa is continually on the lookout for real-time operating systems that are suitable for mission-critical applications.

Middleware

Moxa offers a variety of middleware to help you easily integrate these application modules into your system. This is essential for leveraging the key features of these modules and reducing the effort required for application development.



VPN

The VPN (OpenVPN, L2TP, and IPSec) middleware makes it easy for user applications to create secure tunnels between communication parties.

Firewall

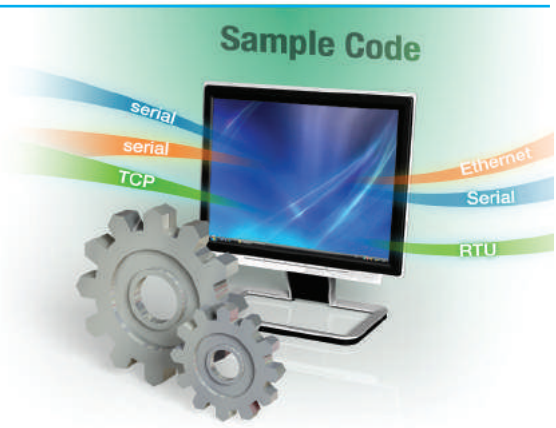
The firewall (iptable) middleware protects enterprise information from unfriendly access.

Database

The database system (MySQL and MSSQL) middleware can be used to manage eld-data acquisition, with web services (Web, PHP, ASP) included to give programmers an integration framework for building Internet accessible eld applications, such as WebSCADA.

Sample Code

To reduce customers' development cost, Moxa provides sample code for a wide range of embedded applications, including serial-to-Ethernet (S2E), serial-to-serial (S2S), and Modbus TCP and RTU. The high-level sample code and application libraries hide the details of implementing complex data communication by presenting relatively simple function prototypes for user applications. In addition, low-level libraries that manage direct access to peripheral I/O devices, such as LCM, keypad, digital I/O signals, and watchdog functions, are also included. With ready access to such a rich assortment of embedded applications, programmers obtain much greater flexibility than would otherwise be possible. These libraries help programmers quickly grasp the full functionality of their applications, and in this way gain the confidence needed to complete their project, speeding up product development and ensuring that code is efficient and bug-free.



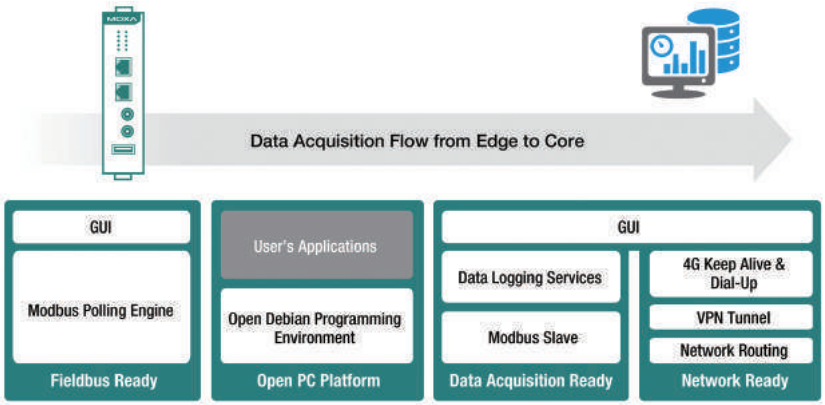
Download

To download Sample Code, visit the following link:

http://rcorecommunity.moxa.com/samplecodedownload

ThingsPro Suite

ThingsPro Suite, which is built on an open Debian Linux platform, enables the integration of fieldbus communications, computing, data acquisition, and wireless networking in a few simple steps. Featuring a Data Logger and Wireless Manager tools, ThingsPro Suite empowers users to focus primarily on their applications instead of the complex integration between things in the field and services in a central computing facility.



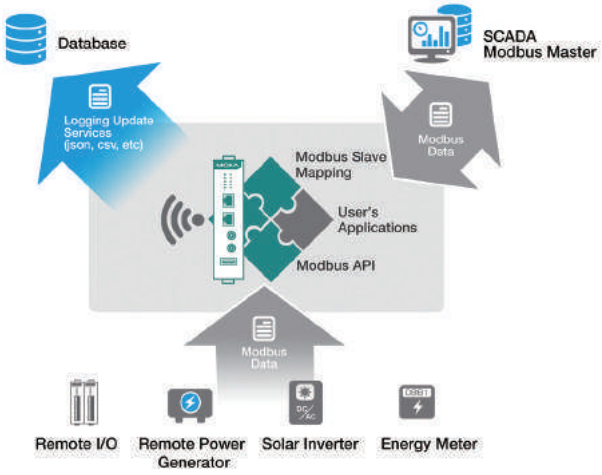
Data Acquisition Flow from Edge-to-Core

ThingsPro Data Logger

A programmable Modbus data logger to enable your industrial IoT applications:

Features and Benefits

- Ready-to-run Modbus RTU and Modbus/TCP polling engine; Modbus knowledge not required.
- Modbus tag API to interface with user applications if data computing is required, providing greater programming flexibility.
- Ready-to-run data-logging software supported to interface with a remote database, making data acquisition easier.

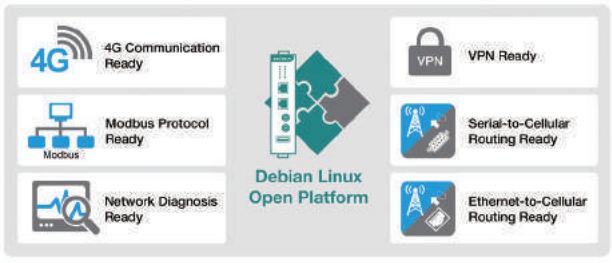


ThingsPro Wireless Manager

A communication-ready programmable platform to enable your industrial IoT applications:

Features and Benefits

- Modbus-protocol-ready for easy interfacing with Modbus devices
- 4G-communication-ready to ensure that your 4G connection is always active
- Network-system-log-ready for easy 4G and network troubleshooting
- VPN-ready for easy setup of remote VPN tunnels from a central server
- Ethernet/serial-to-cellular routing to connect all peripherals to the 4G network



Power Computers

Product Selection Guide

Power Computers 21-2

Substation Computers

DA-820 Series: IEC 61850 native PRP/HSR computer 21-4

DA-682A Series: x86 2U 19-inch rackmount computer with Intel® i7 CPU, 6 gigabit Ethernet ports, 2 PCI expansion slots, fanless design 21-9

DA-681A Series: x86 1U 19-inch rackmount computers with 3rd Gen Intel® Core™ Celeron 1047UE 1.4GHz CPU, 2 isolated RS-232/422/485 and 10 isolated RS-485 ports, 6 LANs, VGA, mSATA, USB 21-12

DA-683 Series: x86 ready-to-run embedded computers with Intel Atom D510, DVI-I, 6 LANs, 2 serial ports, 4 DIs, 4 DOs, 4 USB 2.0 ports, CompactFlash, 2 peripheral expansion slots 21-17

DA-685 Series: x86 rackmount substation computers with VGA, 2 RS-232/422/485 and 6 RS-485 serial ports, 6 LAN Ports, CompactFlash, USB 21-21

DA-662A Series: RISC 19-inch rackmount data acquisition computers with 8-16 serial ports, Ethernet, USB . . 21-25

DA-710 Series: x86 embedded computers with 2 serial ports, quad LANs, VGA, 4 DIs, 4 DOs, USB, and 4 peripheral expansion slots 21-29

DA Series Expansion Modules: Expansion modules with time-synchronization ports, RS-232/422/485 and RS-232/485 serial ports, 10/100 Mbps LAN and unmanaged switch ports, 100 Mbps fiber LAN ports, and PCI development kit 21-32

AMI & Solar Computers

UC-8100 Series: Communication-centric RISC computing platform 21-36

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Power Computers

Power Computers

	DA-820 Series	DA-682A Series	DA-681A Series	DA-683 Series
Computer				
CPU Speed	2.5 GHz/2.1 GHz	1.4 GHz single core / 1.1 GHz dual core / 1.5 GHz dual core	1.4 GHz	1.66 GHz
OS	–	Linux Debian 7 or Windows Embedded Standard 7 (pre-installed) Note: The OS is pre-installed.	Linux Debian 8 (pre-installed) Note: W7E available by CTOS	Linux, Windows Embedded Standard 2009, or Windows Embedded Standard 7 Note: The OS is pre-installed.
OS (Optional)	64-bit Debian 7 64-bit Windows Embedded Standard 7 64-bit Windows 7 Professional for embedded systems	–	–	–
System Memory	Max. 16 GB capacity (204-pin SO-DIMM x 2, each supporting un-buffered ECC DDR3 memory at 1333 and 1600 MT/s, 8 GB Max.)	8 GB capacity, 1 GB (LX) / 2 GB (W7E) pre-installed: 1 slot of 4 GB DDR3-1066/1333 SO-DIMM SDRAM	8 GB capacity, 2 GB for Linux pre-installed; 1 slot of DDR3-1066/1333 SO-DIMM SDRAM	2 GB capacity, 1 GB (LX and XPE)/ 2 GB (W7E) pre-installed: 1 or 2 slots of 2 GB 200-pin DDR2-667 SO-DIMM
Expansion Bus	–	–	PCI/104 onboard (DPP models only)	PCI/104 interface reserved
USB	USB 2.0 hosts x 6, type A connector	USB 2.0 hosts x 2, type A connector	USB 2.0 hosts x 4, type A connector	USB 2.0 hosts x 4, type A connector
Storage				
Built-in	CFast socket: Optional Cfast card to store OS	2 GB (LX) / 8 GB (W7E) industrial DOM for read-only OS volume	8 GB for Linux (pre-installed in mSATA)	2 GB (LX and XPE) / 8 GB (W7E) industrial DOM onboard to store OS
Storage Expansion	4 SATA 2.0 interfaces, supporting RAID 0, 1, 5, 10, hot-swappable	• 1 x CompactFlash socket • 2 x SATA-300 connector	SATA 3.0 interface	CompactFlash socket for CF card expansion, supporting CF Type-I/II
Display				
Graphics Controller	Intel® HD Graphics 4000	Intel 915GME, and Intel Extreme Graphics 2 technology	Intel® HD Graphics (Integrated)	Intel® GMA3150 graphics controller in Intel D510 card
Display Interface	2 VGA outputs (DB15 female connector)	1 VGA output (DB15 female connector)	1 VGA output (DB15 female connector)	Analog RBG display/Digital DVI display
Resolution	CRT display mode with pixel resolution up to 2048 x 1536 at 75 Hz	CRT display mode with pixel resolution up to 2548 x 1536 at 75 Hz	CRT display mode with pixel resolution up to 2048 x 1536 at 75 Hz	• Analog RBG display; output resolution up to 2048 x 1536 @ 60 Hz • Digital DVI display; output resolution up to 1024 x 768 @ 60 Hz
Ethernet Interface				
LAN	10/100/1000 Mbps ports x 4	10/100/1000 Mbps ports x 6	10/100/1000 Mbps ports x 6	10/100/1000 Mbps ports x 6
Magnetic Isolation Protection	1.5 kV built-in	1.5 kV built-in	1.5 kV built-in	1.5 KV built-in
Serial Interface				
Serial Standards	2 RS-232/422/485 ports (DB9 male)	–	• 2 RS-232/422/485 ports (DB9 male) • 10 RS-485 ports (terminal block)	2 RS-232 ports (DB9 male)
ESD Protection	–	–	15 kV for all signals	–
Surge Protection	–	–	4 kV (DA-681A-I-DPP Series)	–
Serial Signals				
RS-232	TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND	–	TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND	TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND, RI
RS-422	TxD+, TxD-, RxD+, RxD-, GND	–	TxD+, TxD-, RxD+, RxD-, GND	–
RS-485-4w	TxD+, TxD-, RxD+, RxD-, GND	–	TxD+, TxD-, RxD+, RxD-, GND	–
RS-485-2w	Data+, Data-, GND	–	Data+, Data-, GND	–
Digital Input/Digital Output				
Input/Output Channels	–	–	–	4, sink-type
Input Voltage/Output Current	–	–	–	0 to 30 VDC/200 mA per channel max.
Physical Characteristics				
Housing	SECC sheet metal (1 mm)	SECC sheet metal (1 mm)	SECC sheet metal (1 mm)	SECC sheet metal (1 mm)
Weight	14 kg (31.11 lb)	7 kg (15.56 lb)	4.5 kg (10 lb)	4 kg (8.89 lb)
Dimensions	361 x 440 x 133 mm (14.23 x 17.32 x 5.24 in) (without rackmount ears)	440 x 315 x 90 mm (17.32 x 12.40 x 3.54 in) (without rackmount ears)	440 x 315 x 45 mm (17.32 x 12.40 x 1.77 in), 19-inch 1U height	315 x 440 x 90 mm (12.40 x 17.32 x 3.54 in) (without rackmount ears)
Environmental Limits				
Operating Temperature	• DA-820-C8: -40 to 60°C (-40 to 140°F) • DA-820-C7: -40 to 75 °C (-40 to 167°F)	-10 to 60°C (14 to 140°F)	SP Models: -25 to 55°C (-13 to 131°F) DPP Models: -25 to 55°C (-13 to 131°F) DPP-T Models: -40 to 70°C (-40 to 158°F)	Standard models: -10 to 60°C (14 to 140°F) DPP-T models: -40 to 70°C (-40 to 158°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)	-20 to 80°C (-4 to 176°F)	-40 to 85°C (-40 to 185°F)	Standard models: -20 to 80°C (-4 to 176°F) DPP-T models: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Power Requirements				
Input Voltage	• High Voltage: 100 to 240 VAC/VDC, 50/60 Hz, 1 A • Low Voltage: 24 to 110 VDC, 4.7 A	100 to 240 VAC auto-ranging (47 to 63 Hz for AC input)	100 to 240 VAC; 100 to 240 VDC	100 to 240 VAC, 50/60 Hz, 0.9-0.4 A
Multiple Power Supplies	Single /Dual power supplies	–	Single / Dual power supplies	Single / Dual power supplies
Power Consumption	60 W	30 W (full loading)	25 W	40 W
Standards and Certifications				
Safety	LVD, UL, cUL	UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1, CCC (GB4943, GB9254, GB17625.1)	UL 60950-1, IEC 60950-1, EN 60950-1	UL/cUL (UL 60950-1, CSA C22.2 No. 60950-1-03), LVD (EN 60950-1), CCC (GB4943)
Electrical Substation	IEC 61850-3, IEC 60255, IEEE 1613	–	IEC 61850-3, IEEE 1613, IEC 60255	IEC 61850-3, IEEE 1613
Protection Relay	IEC 60255	–	IEC 60255	–
EMS	IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11			
Green Product	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE
Warranty				
Warranty Period	3 years	3 years	3 years	3 years
Details	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty
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Power Computers

	DA-685 Series	DA-710 Series	DA-662A Series	UC-8100 Series
Computer				
CPU Speed	1.66 GHz	2.2 GHz	500 MHz	300/600/1000 MHz
OS	Linux, Windows Embedded Standard 2009, or Windows Embedded Standard 7	Windows Embedded Standard 2009, Linux 2.6	Embedded Linux (pre-installed)	–
System Memory	2 GB capacity, 1 GB (LX and XPE)/ 2 GB (W7E) pre-installed: 1 or 2 slots of 2 GB 200-pin DDR2-667 SO-DIMM	2 GB capacity, 1 GB pre-installled: 1 slot of DDR2-533/667 200-pin SO-DIMM SDRAM	128 MB DRAM onboard, 32 MB Flash onboard	256 or 512 MB DDR3 SDRAM
Expansion Bus	PCI/104 interface reserved		–	–
USB	USB 2.0 hosts x 2, type A connector	USB 2.0 hosts x 4, type A connector	–	USB 2.0 hosts x 1, type A connector
Storage				
Built-in	2 GB (LX and XPE) / 8 GB (W7E) industrial DOM onboard to store OS	2 GB industrial DOM onboard to store OS	–	–
Storage Expansion	CompactFlash socket	CompactFlash socket	–	1 GB SD or 2 GB MicroSD card pre-installed
Other Peripherals				
KB/MS	1 PS/2 interface, supports standard PS/2 keyboard and mouse through Y-type cable	1 PS/2 interface, supports standard PS/2 keyboard and PS/2 mouse	–	–
Graphics Controller	Intel® GMA3150 graphics controller on Intel D510 card	Integrated Intel graphics media accelerator (GMA X3100)	–	–
Intel Clear Video Technology		MPEG-2 hardware accelerator, Microsoft DirectX 9	–	–
Display Interface	1 VGA output (DB15 female connector)	1 VGA output (DB15 female connector)	–	–
Resolution	CRT display mode with pixel resolution up to 2048 x 1536 at 75 Hz	QXGA maximum with resolution up to 2048 x 1536 at 60 Hz	–	–
Ethernet Interface				
LAN	Auto-sensing 10/100/1000 Mbps ports x 6	Auto-sensing 10/100/1000 Mbps ports (RJ45) x 4	Auto-sensing 10/100 Mbps ports (RJ45) x 4	Auto-sensing 10/100 Mbps ports (RJ45) x 2
Magnetic Isolation Protection	1.5 kV built-in	1.5 kV built-in	1.5 kV built-in	1.5 kV built-in
Serial Interface				
Serial Standards	• 2 RS-232/422/485 ports (DB9 male) • 6 RS-485-2W ports (terminal block)	2 RS-232 ports (DB9 male)	8 to 16 RS-232/422/485 ports, software selectable (8-pin RJ45)	RS-232/422/485 ports, software-selectable (5-pin terminal block connector) x 1 or 2
ESD Protection	–	4 kV for all signals	8 kV contact, 15 kV Air ESD protection for all signals	
Console Port	–	–	RS-232 (all signals), RJ45 connector	RS-232 (TxD, RxD, GND), 4-pin pin header output (115200, n, 8, 1)
Serial Signals				
RS-232	TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND, RI	TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND	TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND (DA-662A-I-8/16-LX only: TxD, RxD, RTS, CTS, GND)	TxD, RxD, RTS, CTS, GND
RS-422	TxD+, TxD-, RxD+, RxD-, GND	–	TxD+, TxD-, RxD+, RxD-, GND	TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w	TxD+, TxD-, RxD+, RxD-, GND	–	TxD+, TxD-, RxD+, RxD-, GND	TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w	Data+, Data-, GND	–	Data+, Data-, GND	Data+, Data-, GND
Digital Input/Digital Output				
Input Channel/Output Channel	–	4, sink-type	–	–
Input Voltage/Output Current	–	0 to 30 VDC/max. 200 mA per channel	–	–
Physical Characteristics				
Housing	SECC sheet metal (1 mm)	SECC sheet metal (1 mm)	SECC sheet metal (1 mm)	Polycarbonate plastic
Weight	4 kg (8.89 lb)	14 kg (31.11 lb)	4.3 kg (9.56 lb)	224 g (0.50 lb)
Dimensions	315 x 440 x 90 mm (12.40 x 17.32 x 3.54 in) (without rackmount ears)	• Without ears: 400 x 420 x 180 mm (15.75 x 16.54 x 7.09 in) • With ears: 400 x 480 x 180 mm (15.75 x 18.90 x 7.09 in)	Without ears: 440 x 45 x 237 mm (17.32 x 1.77 x 9.33 in) With ears: 480 x 45 x 237 mm (18.90 x 1.77 x 9.33 in)	101 x 27 x 128 mm (3.98 x 1.06 x 5.04 in)
Mounting	Standard 19-inch rackmount	Standard 19-inch rackmount	Standard 19-inch rackmount	DIN-rail, wall (with optional kit)
Environmental Limits				
Operating Temperature	-10 to 55°C (14 to 131°F)	-10 to 50°C (14 to 122°F)	-10 to 60°C (14 to 140°F)	-10 to 60°C (14 to 140°F) or -40 to 75°C (-40 to 167°F)
Storage Temperature	-20 to 80°C (-4 to 176°F)	-20 to 80°C (4 to 176°F)	-20 to 80°C (-4 to 176°F)	-40 to 80°C (-40 to 176°F)
Ambient Relative Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Power Requirements				
Input Voltage	100 to 240 VAC, 50/60 Hz, 0.9-0.4 A	Single or dual inputs, 100 to 240 VAC/ VDC auto-ranging, 47 to 63 Hz, terminal block	100 to 240 VAC auto ranging (47 to 63 Hz for AC input)	12 to 24 VDC (3-pin terminal block, V+, V-, SG)
Power Consumption	40 W	60 W	20 W	5.4 W
Standards and Certifications				
Safety	LVD, UL, cUL, CCC	UL 60950-1, CSA C22.2 No. 60950-1-07, CCC (GB4943, GB9254, GB17625.1)	UL 60950-1	UL 60950-1, EN 60950-1
EMS	IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11			–
Green Product	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE
Warranty				
Warranty Period	3 years	3 years	5 years	5 years
Details	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty
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DA-820 Series

IEC 61850 native PRP/HSR computer

- Intel Core i7 dual/quad-core processor with Intel QM77 Express chipset
- 2 x 204-pin SO-DIMM ECC DDR3 sockets, supporting un-buffered ECC DDR3 1333/1600 memory at 1333 and 1600 MT/s, 16 GB max.
- 6 USB 2.0 ports for high speed peripherals
- 3 PCIe x1 slots and 2 PCI slots for expansion modules
- 1 PCIe x16 slot for an additional video card
- Highly reliable design, supporting dual power, RAID 0/1/5/10, and PRP/HSR technology (with PRP/HSR expansion module)
- Cybersecurity function
- IEC 61850-3 (general requirements for electrical substation automation, EMC Level 4, C3, Bm)
- IEEE 1613 compliant (environmental and testing requirements for communications networking devices in electric power substations)
- IEC 60255 compliant (measuring relays and protection equipment)

Overview

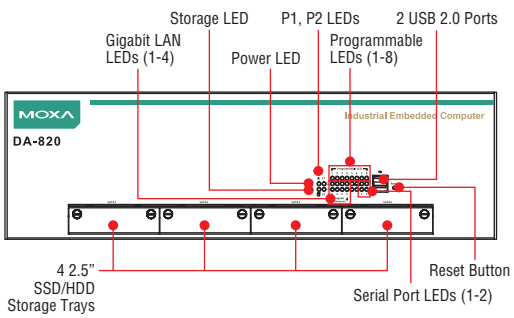
The DA-820's main operating system is based on the Intel quad-core i7-3612QE CPU and QM77 chipset, which supports standard x86, 2 VGA ports, 6 USB port, 4 gigabit LAN ports, and 2 3-in-1 RS-232/422/485 serial ports. The DA-820 is equipped with a 4 SATA disk interface and supports RAID 0/1/5/10 functionality. The DA-820 is specifically designed for substation applications that require precise time synchronization and adherence to the IEC 61850-3 standards. The flexible design makes the DA-820 suitable for local SCADA, environmental monitoring, video surveillance, protocol conversion, and PRP/HSR redundancy applications. In addition, the cybersecurity function makes the DA-820 an ideal solution for secure network communication applications.

The DA-820 complies with the IEC 60255 standards to enable the protection of electrical relays in a smart substation. IEC 60255 is one of the most widely used standards for testing relays and protection equipment, and compliance ensures that the DA-820 will work reliably and seamlessly with IEDs (intelligent electronic devices) as a part of the robust substation automation system.

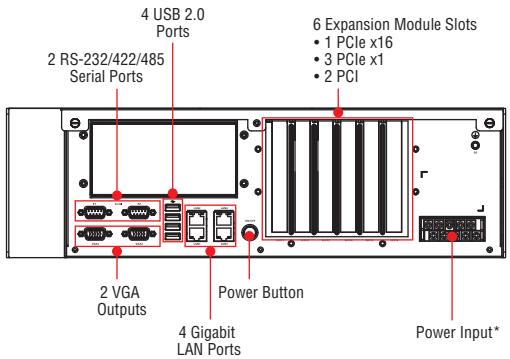
The housing is a standard 3U, 19-inch wide, rack-mounted rugged enclosure. This robust, rack-mountable design provides the hardened protection needed for industrial environment applications.

Appearance

Front View

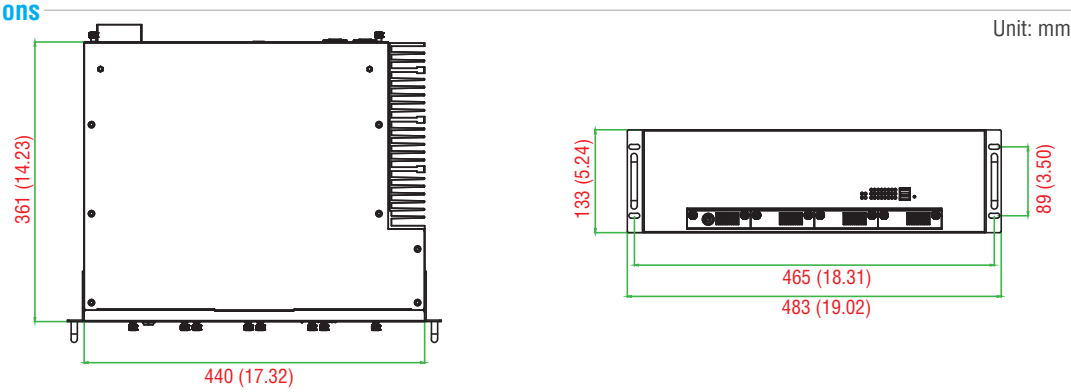


Rear View



Dimensions

Unit: mm (inch)



Hardware Specifications

Computer

CPU:
• DA-820-C7: Intel dual-core i7-3555LE 2.5 GHz processor
• DA-820-C8: Intel quad-core i7-3612QE 2.1 GHz processor
OS (Optional):
64-bit Debian 7
64-bit Windows Embedded Standard 7
64-bit Windows 7 Professional for embedded systems
Note: The OS is optional; you may purchase Windows 7 Embedded Standard 7 or Windows 7 Professional for embedded systems via CTOS, or download Debian 7 from our website.
System Chipset: QM77
BIOS: SPI Flash 64 Mbit BIOS, PCI Plug & Play, ACPI function support
System Memory: Max. 16 GB capacity (204-pin SO-DIMM x 2, each supporting un-buffered ECC DDR3 memory at 1333 and 1600 MT/s, 8 GB Max.)
USB:
• Rear panel: USB 2.0 hosts x 4, Type A connector
• Front panel: USB 2.0 hosts x 2, Type A connector

Storage

Built-in: CFast socket: Optional Cfast card to store OS
Storage Expansion: 4 SATA 2.0 interfaces, supporting RAID 0, 1, 5, 10, hot-swappable

Display

Graphics Controller: Intel® HD Graphics 4000
Display Interface: 2 VGA outputs (DB15 female connector)
Resolution: CRT display mode with pixel resolution up to 2048 x 1536 at 75 Hz

Ethernet Interface

LAN: Auto-sensing 10/100/1000 Mbps ports x 4
• Ethernet 1 to 3: Intel 82574 gigabit Ethernet controller
• Ethernet 4: Intel 82579 gigabit Ethernet controller supporting Intel AMT technology
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface

Serial Standards: 2 RS-232/422/485 ports (DB9 male)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

LEDs

System: Power, Storage
Gigabit LAN: 100M x 4, 1000M x 4
Serial: TX/RX
Programmable: LED x 8

Switches and Buttons

Power Switch: on/off (on rear panel)

Physical Characteristics

Housing: SECC sheet metal (1 mm)
Weight: 14 kg (31.11 lb)
Dimensions: 361 x 440 x 133 mm (14.23 x 17.32 x 5.24 in) (without rackmount ears)
Mounting: Standard 19-inch rackmount

Environmental Limits

Operating Temperature:
• DA-820-C8: -40 to 60°C (-40 to 140°F)
• DA-820-C7: -40 to 75 °C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: 2 Grms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis
Anti-Shock: 20 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage:
• High Voltage: 100 to 240 VAC/VDC, 50/60 Hz, 1 A
• Low Voltage: 24 to 110 VDC, 4.7 A
Multiple Power Supplies:
• SP: Single power supply
• DP: Dual power supplies
Power Consumption: 60 W

Standards and Certifications

Safety: LVD, UL, cUL
Electrical Substation: IEC 61850-3, IEC 60255, IEEE 1613
Protection Relay: IEC 60255
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power 4 kV; Signal 4 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8: 20 A/m
IEC 61000-4-9: 300 A/m
IEC 61000-4-11: (AC models only)
Green Product: RoHS, CRoHS, WEEE

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock) with lithium backup battery
Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 level time interval system reset, software programmable

MTBF (mean time between failures)

Time:
DA-820-C7-DP-HV-T: 138,503 hrs
DA-820-C7-SP-HV-T: 191,570 hrs
DA-820-C8-DP-HV: 128,077 hrs
DA-820-C8-SP-HV: 172,182 hrs
DA-820-C7-SP-LV-T: 240,015 hrs
DA-820-C7-DP-LV-T: 221,019 hrs
DA-820-C8-SP-LV: 240,015 hrs
DA-820-C8-DP-LV: 221,019 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

Warranty Period: 3 years
Details: See www.moxa.com/warranty

Software Specifications

Linux

OS: 64-bit Linux Debian 7
Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML
File System: EXT 4
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, Netfilter/iptables
Secure Shell for Remote Access: SSH allows remote logins to a secure encrypted console from any connected network
Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).
File Server: Enables remote clients to access files and other resources over the network
Watchdog: A watchdog timer that triggers a system reset upon software freezes, for both specific applications and system-wide failures.
Application Development Software:
• Moxa API Library (Watchdog timer, Moxa serial I/O control)
• GNU C/C++ cross-compiler
• GNU C library
• Perl
Software Package:
• SNMP
• SafeGuard technology

Windows Embedded Standard 7

Core OS:
• 64-bit support
• Remote Client
• Remote Procedure Call
Applications and Services Development:
• .Net Framework 3.5
• Remote Desktop Protocol 7.1
• COM OLE Application Support
• COM+ Application Support
• MSMQ
Internet Services:
• Internet Explorer 8.0
• IIS 7.0
File Systems and Data Storage:
• Windows Data Access Components
• Windows Backup and Restore
Diagnostics:
• Common Diagnostic Tools
• Problem Reports and Solutions
Fonts: Chinese (Trad. and Simp.), Japanese, Korean, Western, Middle Eastern, South East Asian, and South Asian Fonts
Graphics and Multimedia:
• MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
• MPEG Layer-3 Audio Codecs(MP3)
• MPEG4 Decoders
• Windows Media Video VC-1 (WMV) Codecs
• DirectX and Windows Device Experience
• Windows Media Player 12
• Create and Play DVDs
• Photo Viewer
• Remote media streaming
• Windows Media Center
International:
• IME Simplified Chinese Support
• IME Traditional Chinese Support
• IME Japanese Support
• IME Korean Support
Management:
• Group Policy Management
• Windows Management Instrument (WMI)
• Windows Update
Networking:
• Extensible Authentication Protocol (EAP)
• Internet Authentication Service
• Telnet Server
• Bluetooth
• Domain Services
• Network Access Protection
• Network and Sharing Center
• Quality of Service
• Remote Access Service (RAS)
• Telephony API Client
• Windows Firewall
• Wireless Networking
Security:
• Credential Roaming Service
• Credentials and Certificate Management
• Windows Authorization Manager (AZMAN)
• Windows Security Center
• Active Directory Rights Management
• Security Base
• Encrypted File System (EFS)
• MS AntiMalware
• Windows Defender
• Bitlocker Secure Startup
• Applocker
Enterprise Features:
• Enterprise Search Scopes
• BranchCache
• DirectAccess
• Windows XP Mode

Embedded Features:
• Enhanced Write Filter (EWF)
• File-Based Write Filter (FBWF)
• Message Box Default Reply
• Registry Filter
• WSDAPI for .NET
Embedded Self-Health Diagnostics: SNMP-based remote scripting layer for monitoring, reporting, and control

Windows 7 Professional for Embedded Systems

Core OS:
• 64-bit support
• Remote Client
• Remote Procedure Call
Applications and Services Development:
• .Net Framework 3.5
• Remote Desktop Protocol 7.1
• COM OLE Application Support
• COM+ Application Support
• MSMQ
Internet Services:
• Internet Explorer 8.0
• IIS 7.0
File Systems and Data Storage:
• Windows Data Access Components
• Windows Backup and Restore
Diagnostics:
• Common Diagnostic Tools
• Problem Reports and Solutions
Graphics and Multimedia:
• MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
• MPEG Layer-3 Audio Codecs(MP3)
• MPEG4 Decoders
• Windows Media Video VC-1 (WMV) Codecs
• DirectX and Windows Device Experience
• Windows Media Player 12
• Create and Play DVDs
• Photo Viewer
• Remote media streaming
• Windows Media Center
Management:
• Group Policy Management
• Windows Management Instrument (WMI)
• Windows Update
Networking:
• Extensible Authentication Protocol (EAP)
• Internet Authentication Service
• Telnet Server
• Bluetooth
• Domain Services
• Network Access Protection
• Network and Sharing Center
• Quality of Service
• Remote Access Service (RAS)
• Telephony API Client
• Windows Firewall
• Wireless Networking
Security:
• Credential Roaming Service
• Credentials and Certificate Management
• Windows Authorization Manager (AZMAN)
• Windows Security Center
• Active Directory Rights Management
• Security Base
• Encrypted File System (EFS)
• MS AntiMalware
• Windows Defender
Embedded Self-Health Diagnostics: SNMP-based remote scripting layer for monitoring, reporting, and control

Ordering Information

Model	Configuration
DA-820-C7-SP-HV	i7-3555LE, dual-core 2.5 GHz, 100 to 240 VAC/VDC, -40 to 60°C, w/o CFast/RAM/OS
DA-820-C7-SP-HV-T	i7-3555LE, dual-core 2.5 GHz, 100 to 240 VAC/VDC, -40 to 75°C, w/o CFast/RAM/OS
DA-820-C7-SP-LV-T	i7-3555LE, dual-core 2.5 GHz, 24 to 110 VDC, -40 to 75°C, w/o CFast/RAM/OS
DA-820-C7-DP-HV	i7-3555LE, dual-core 2.5 GHz, 100 to 240 VAC/VDC x 2, -40 to 60°C, w/o CFast/RAM/OS
DA-820-C7-DP-HV-T	i7-3555LE, dual-core 2.5 GHz, 100 to 240 VAC/VDC x 2, -40 to 75°C, w/o CFast/RAM/OS
DA-820-C7-DP-LV-T	i7-3555LE, dual-core 2.5 GHz, 24 to 110 VDC x 2, -40 to 75°C, w/o CFast/RAM/OS
DA-820-C8-SP-HV	i7-3612QE, quad-core 2.1 GHz, 100 to 240 VAC/VDC, -40 to 60°C, w/o CFast/RAM/OS
DA-820-C8-SP-LV	i7-3612QE, quad-core 2.1 GHz, 24 to 110 VDC, -40 to 60°C, w/o CFast/RAM/OS
DA-820-C8-DP-HV	i7-3612QE, quad-core 2.1 GHz, 100 to 240 VAC/VDC x 2, -40 to 60°C, w/o CFast/RAM/OS
DA-820-C8-DP-LV	i7-3612QE, quad-core 2.1 GHz, 24 to 110 VDC x 2, -40 to 60°C, w/o CFast/RAM/OS

Package Checklist

- DA-820 rackmount computer
- 19-inch rackmount kit
- Documentation CD or DVD
- Quick installation guide (printed)
- Warranty card

To order a DA-820 system with a pre-installed OS, please contact a Moxa sales representative.

Recommended Configuration

Operating System	System Memory	CFast Card
64-bit Linux Debian 7	≥ 2 GB	≥ 2 GB
Windows Embedded Standard 7	≥ 4 GB	≥ 16 GB

Optional DA-820 Expansion Modules	
DA-IRIG-B-S-02-T	IRIG-B expansion module, PCI interface, 1 fiber IRIG-B in, 1 DB9M in/out, 1 DB9M out
DA-IRIG-B-S-04-T	IRIG-B expansion module, PCI interface, 1 fiber IRIG-B in, 1 DB9M in/out, 3 DB9M out
DA-PRP-HSR	PRP, HSR expansion module, PCIe interface
DE-GX02-SFP-T	2-port 1000 Mbps fiber card, SFP slot x 2, PCIe interface (SFP module excluded)
DE-FX02-SFP-T	2-port 100 Mbps fiber card, SFP slot x 2, PCIe interface (SFP module excluded)

Slot	No.	Expansion Card	Application	Moxa Product
PCIe x 16	1	Video Card	Video surveillance	(purchase from another vendor)
		RAID Card	Data storage	(purchase from another vendor)
PCIe x 1	3	PRP/HSR Card	Communication redundancy	DA-PRP-HSR
		LAN Card/Fiber Card	Data transmission	DE-GX02-SFP-T DE-FX02-SFP-T
		RS-232 RS-422 RS-485 CAN	Device control or data acquisition	CP-116E-A CP-118E-A-I CP-138E-A-I CP-134EL-A-I CP-602E-I (CAN Card)
PCI	2	IRIG-B	Time synchronization	DA-IRIG-B-S-02-T DA-IRIG-B-S-04-T
		RS-232 RS-422 RS-485 CAN	Device control or data acquisition	CP-118U/CP-118U-I CP-168U CP-104UL CP-602U-I (CAN Card)

Optional Accessories

Model	Description	Application
Mini DB9F-to-TB	DB9 female to terminal block adapter	For IRIG-B card
DDR3-THERMAL-KIT-82001	DDR3 SDRAM Thermal Kit	For non-DDR3L SDRAM
FAN-KIT-82001	Fan kit without lock	Fan Kit for when using a 3rd party high performance graphics accelerator card in the PCIe x 16 slot.
FAN-KIT-82002	Fan kit with lock	Fan Kit for when using a 3rd party high performance graphics accelerator card in the PCIe x 16 slot.t
HDD-DOOR-LOCK-82001	HDD kit with thermal hole	For heat dissipation

DA-682A Series

x86 2U 19-inch rackmount computer with Intel® i7 CPU, 6 gigabit Ethernet ports, 2 PCI expansion slots, fanless design

- 2nd generation Intel core processors (Sandy Bridge)
- Built-in DDR3 SDRAM and industrial DOM
- 6 Gigabit Ethernet ports for network redundancy
- 2 PCI expansion slots for expansion modules
- 1 CompactFlash socket for storage expansion
- 4 high speed, system-bootable USB 2.0 ports
- 19 inch 2U rack-mountable case
- 100/240 VAC power inputs
- Ready-to-Run Linux or Windows Embedded Standard 7 platform
- Fanless design

Overview

The DA-682A series of computers are x86 platforms with VGA, 6 gigabit Ethernet ports, CompactFlash, USB, and two PCI ports for DA Series expansion modules. The DA-682A comes in a standard 19-inch 2U rack-mountable case.

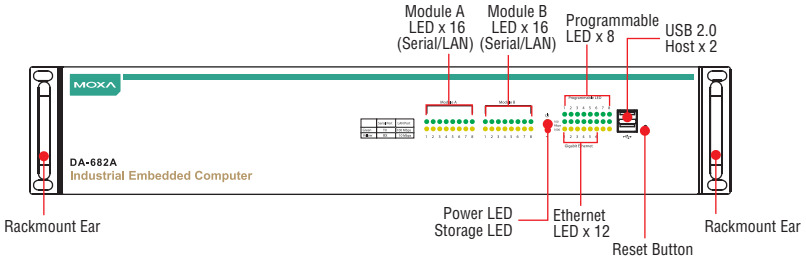
With their robust design, DA-682A computers are specialized for industrial automation applications: power substations, transportation and shipping, and oil and gas production and supply.

The DA-682A runs either Linux or Windows Embedded Standard 7, providing a friendly environment for developing sophisticated application software. Moxa's ready-to-run software and readily available after-service support makes the programmer's job easier, helping programmers develop bug-free code quickly and at a lower cost. In addition, the DA-682A also comes with three different CPU options, and basic models that allow system designers to install the DOM, RAM, and operating system according to their specific requirements. This is particularly flexible for building custom industrial solutions.

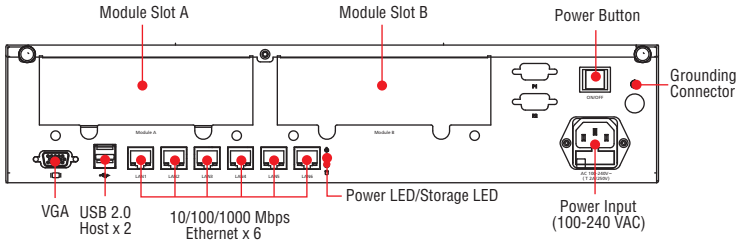
The DA-682A comes with 2 PCI ports that accept DA series expansion modules. Moxa provides a variety of communication modules for the DA series, including an 8-port RS-232/422/485 module, a 4-port 10/100 Mbps LAN module, and a universal PCI expansion module. This friendly design gives users the advantage of being able to swap out modules quickly and easily, making the DA-682A an ideal solution for a wide array of industrial automation applications.

Appearance

Front View



Rear View



Hardware Specifications

Computer

CPU: 2nd generation Intel core processors (Sandy Bridge)
• Intel Celeron 827E, 1.4 GHz single-core processor
• Intel Celeron 847E, 1.1 GHz dual-core processor
• Intel Core i7-2610UE, 1.5 GHz dual-core processor
OS: Linux or Windows Embedded Standard 7 (pre-installed)
Note: The OS is pre-installed.
System Chipset: Intel HM65
BIOS: 64 Mbit Flash BIOS, PCI Plug & Play, ACPI
System Memory: 8 GB capacity, 1 GB (LX) / 2 GB (W7E, 32-bit) pre-installed: 1 slot of 4 GB DDR3-1066/1333 SO-DIMM SDRAM
USB: USB 2.0 hosts x 2, system bootable, Type A connector

Storage

Built-in: 2 GB (LX) / 8 GB (W7E, 32-bit) industrial DOM for read-only OS volume
Storage Expansion:
• 1 x CompactFlash socket
• 2 x SATA-300 connector

Display

Graphics Controller: Integrated graphics with built-in Intel 915GME, and built-in Intel Extreme Graphics 2 technology
Display Memory: Dynamic video memory (shares up to 32 MB of system memory)
Display Interface: 1 VGA output (DB15 female connector)
Resolution: CRT display mode with pixel resolution up to 2548 x 1536 at 75 Hz

Ethernet Interface

LAN: Auto-sensing 10/100/1000 Mbps ports x 6
Magnetic Isolation Protection: 1.5 kV built-in

LEDs

System: Power, Storage
LAN: 100/1000M mode
Programmable: 8 LEDs
Communication: Module A x 16, Module B x 16

Switches and Buttons

Power Button: On/Off (on rear panel)
Reset Button: Soft reboot (on front panel)

Physical Characteristics

Housing: SECC sheet metal (1 mm)
Weight: 7 kg (15.56 lb)
Dimensions: 440 x 315 x 90 mm (17.32 x 12.40 x 3.54 in) (without rackmount ears)
Mounting: Standard 19-inch rack

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -20 to 80°C (-4 to 176°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: 2 Grms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis
Anti-Shock: 20 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: 100 to 240 VAC auto-ranging (47 to 63 Hz for AC input)
Power Consumption: 30 W (full loading)

Standards and Certifications

Safety: UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1, CCC (GB4943, GB9254, GB17625.1)
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GH: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8: 20 A/m
IEC 61000-4-9: 300 A/m
IEC 61000-4-11: (AC models only)
Green Product: RoHS, CRoHS, WEEE

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock) with battery lithium backup
Automatic Reboot Trigger: Built-in watchdog timer, configurable for restarts at 1 to 255 second intervals

MTBF (mean time between failures)

Time: 527,124 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

Warranty Period: 3 years
Details: See www.moxa.com/warranty

Software Specifications

Linux

OS: Linux Debian 7
Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML
File System: EXT2, JFFS2
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, iptables firewall
Secure Shell for Remote Access: SSH allows remote logins to a secure encrypted console from any connected network
Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the Point-to-Point Protocol (PPP). Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).
File Server: Enables remote clients to access files and other resources over the network
Watchdog: A watchdog timer that triggers a system reset upon software freezes, for both specific applications and system-wide failures.
Application Development Software:
• Moxa API Library (Watchdog timer, Moxa serial I/O control)
• GNU C/C++ cross-compiler
• GNU C library
• Perl

Windows Embedded Standard 7

Core OS:
• Windows 7 Embedded, 32 bit
• Sensor and Location Platform
• Remote Procedure Call
Applications and Services Development:
• .Net Framework 3.5
• Remote Desktop Protocol 7.1
• COM OLE Application Support
• COM+ Application Support
• MSMQ
Internet Services:
• Internet Explorer 8.0
• IIS 7.0
File Systems and Data Storage:
• Windows Data Access Components
• Windows Backup and Restore
Diagnostics:
• Common Diagnostic Tools
• Problem Reports and Solutions
Fonts:
• Chinese (Trad. and Simp.), Middle East, South East Asian, and South Asian Fonts
• True Type Fonts

Graphics and Multimedia:
• MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
• MPEG Layer-3 Audio Codecs(MP3)
• MPEG4 Decoders
• Windows Media Video VC-1 (WMV) Codecs
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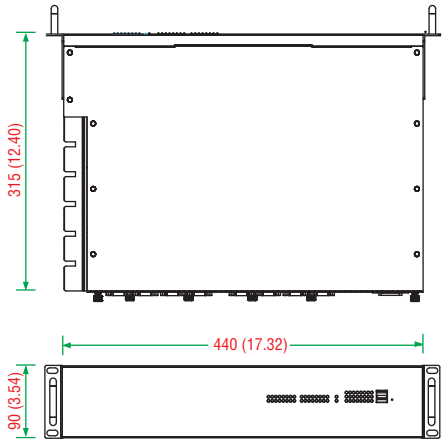
• Windows Media Player 12
International:
• IME Simplified Chinese Support
• IME Traditional Chinese Support
Management:
• Group Policy Management
• Windows Management Instrument (WMI)
• Windows Update
Networking:
• Extensible Authentication Protocol (EAP)
• Internet Authentication Service
• Telnet Server
• Bluetooth
• Domain Services
• Network Access Protection
• Network and Sharing Center
• Quality of Service
• Remote Access Service (RAS)
• Telephony API Client
• Windows Firewall
• Wireless Networking
Security:
• Credential Roaming Service
• Credentials and Certificate Management
• Windows Authorization Manager (AZMAN)
• Windows Security Center
• Active Directory Rights Management
• Security Base
• Encrypted File System (EFS)
Embedded Features:
• Enhanced Write Filter(EWF)
• File-Based Write Filter (FBWF)
• Message Box Default Reply
• Registry Filter
• WSDAPI for .NET
Embedded Self-Health Diagnostics: SNMP-based remote scripting layer for monitoring, reporting, and control

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

DA-682A-C0: Rackmount computer with Celeron 827E, 1.4 GHz, single-core CPU, without DOM/RAM/OS, VGA, 6 gigabit LANs, USB x 4, CompactFlash socket
DA-682A-C0-LX: Rackmount computer with Celeron 827E, 1.4 GHz, single-core CPU, VGA, 6 gigabit LANs, USB x 4, CompactFlash socket, 1 GB system memory, 2 GB Linux Debian 7 pre-installed DOM
DA-682A-C0-W7E: Rackmount computer with Celeron 827E, 1.4 GHz, single-core CPU, VGA, 6 gigabit LANs, USB x 4, CompactFlash socket, 2 GB system memory, 8 GB Windows Embedded Standard 7 pre-installed DOM
DA-682A-C1: Rackmount computer with Celeron 847E, 1.1 GHz, dual-core CPU, without DOM/RAM/OS, VGA, 6 gigabit LANs, USB x 4, CompactFlash socket
DA-682A-C1-LX: Rackmount computer with Celeron 847E, 1.1 GHz, dual-core CPU, VGA, 6 gigabit LANs, USB x 4, CompactFlash socket, 1 GB system memory, 2 GB Linux Debian 7 pre-installed DOM
DA-682A-C1-W7E: Rackmount computer with Celeron 847E, 1.1 GHz, dual-core CPU, VGA, 6 gigabit LANs, USB x 4, CompactFlash socket, 2 GB system memory, 8 GB Windows Embedded Standard 7 pre-installed DOM
DA-682A-C7: Rackmount computer with Core i7-2610UE 1.5 GHz, dual-core CPU, without DOM/RAM/OS, VGA, 6 gigabit LANs, USB x 4, CompactFlash socket
DA-682A-C7-LX: Rackmount computer with Core i7-2610UE 1.5 GHz, dual-core CPU, VGA, 6 gigabit LANs, USB x 4, CompactFlash socket, 1 GB system memory, 2 GB Linux Debian 7 pre-installed DOM
DA-682A-C7-W7E: Rackmount computer with Core i7-2610UE 1.5 GHz, dual-core CPU, VGA, 6 gigabit LANs, USB x 4, CompactFlash socket, 2 GB system memory, 8 GB Windows Embedded Standard 7 pre-installed DOM

Package Checklist

- DA-682A embedded computer
- 19-inch rackmount kit
- Ethernet cable: RJ45-to-RJ45 cross-over cable, 100 cm
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

Expansion Modules (can be purchased separately)

DA-SP08-I-EMC4-DB: 8-port RS-232/422/485 serial module with DB9 connector and isolation; suitable for EMC Level 4 environments
DA-SP08-I-EMC4-TB: 8-port RS-232/422/485 serial module with terminal block connector and isolation; suitable for EMC Level 4 environments
DA-SP08-I-DB: 8-port RS-232/422/485 serial module with a digitally isolated DB9 connector
DA-SP08-DB: 8-port RS-232/422/485 serial module with DB9 connector
DA-SP08-I-TB: 8-port RS-422/485 serial module with digitally isolated terminal block
DA-SP38-I-TB: 8-port RS-422/485 serial module with digitally isolated terminal block
DA-SW08-RJ: 8-port 10/100 Mbps unmanaged switch module
DA-LN04-RJ: 4-port 10/100 Mbps LAN module
DA-UPCI-DK: Universal PCI development kit
DA-FX04-MM-ST-T: 4-port (100BaseFX) fiber LAN module with multi-mode, ST connector, supports IP Teaming

Optional Accessories (can be purchased separately)

DA-682A HDD Kit: Hard disk installation package

DA-681A Series

x86 1U 19-inch rackmount computers with 3rd Gen Intel® Core™ Celeron 1047UE 1.4GHz CPU, 2 isolated RS-232/422/485 and 10 isolated RS-485 ports, 6 LANs, VGA, mSATA, USB

- IEC 61850-3, IEEE 1613, and IEC 60255 compliant for power substation automation systems (DPP and DPP-T models only)
- 3rd Gen Intel® Core™ Celeron 1047UE 1.4 GHz CPU
- 1 built-in DDR3 memory socket
- 1 mSATA for OS and 1 SATA III for storage expansion
- 6 gigabit Ethernet ports for network redundancy
- 4 USB 2.0 ports for high speed peripherals
- 2 isolated RS-232/422/485 and 10 isolated RS-485 ports
- Embedded Debian 8 Linux (W7E by CTOS)
- Supports both 100 to 240 VAC and VDC power inputs (single power and dual power models available)
- Optional IRIG-B expansion module available on DPP and DPP-T models

Overview

The Moxa DA-681A Series x86-based rackmount embedded computers are designed for control, monitoring, data acquisition, and protocol conversion applications. With its robust design, the DA-681A is suitable for industrial automation applications, such as power automation, transportation, and oil and gas.

The DA-681A's main operating system is based on the 3rd Gen Intel® Core™ Celeron 1047UE 1.4 GHz CPU and HM65 chipset, which supports standard x86, 1 x VGA, 4 x USB, 6 gigabit LAN ports, 2 RS/232/422/485 3-in-1 serial ports, and 10 RS-485 (RS-422 by CV) ports. The DA-681A has a mini PCIe socket for mSATA and comes with Linux pre-installed; Windows 7 Embedded is also supported by the CTOS (Configuration To Order Service) process.

Another plus is that the serial ports come with 2 kV digital galvanic isolation protection to guarantee communication reliability in harsh industrial environments. In addition, the state-of-art IEC 61850-3, IEEE 1613, and IEC 60255 compliance all-in-one design provides rich interfaces especially well suited for of power substation automation applications.

Smart Recovery Function

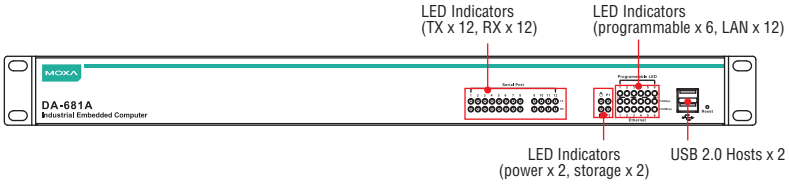
The DA-681A's Smart Recovery function makes it easy to troubleshoot system software errors on computers to minimize downtime. Engineers who are experts in a particular vertical market may not have enough computer domain knowledge to know how to fix the operating system problems. Moxa Smart Recovery™ is an automated BIOS-level software recovery system that allows engineers to automatically trigger OS recovery to minimize downtime.

Proactive Monitoring Function

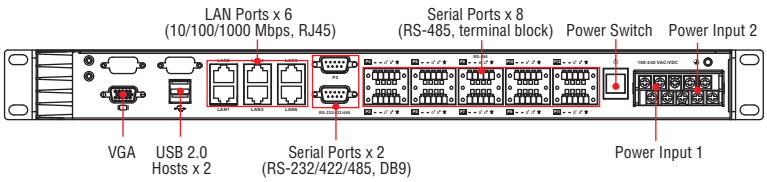
The DA-681A's Proactive Monitoring function monitors the computer's health by keeping an eye on CPU usage, memory usage, storage partition usage, the operating temperature of the CPU and motherboard, and the redundant power monitor, and can trigger a relay to provide either visual or audio alarms.

Appearance

Front View

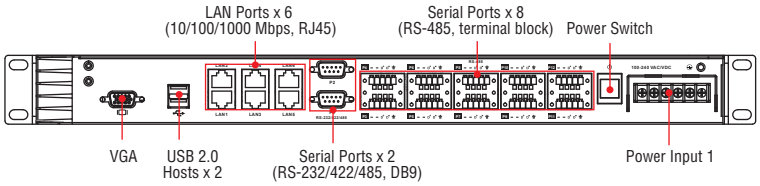


DA-681A-DPP & DA-681A-DPP-T



Rear View

DA-681A-SP



Hardware Specifications

Computer

CPU: 3rd Gen Intel® Core™ Celeron 1047UE 1.4 GHz
OS: Linux Debian 8 (pre-installed)
Note: W7E available by CTOS
System Chipset: Intel HM65
BIOS: 64 Mbit Flash BIOS, PCI Plug & Play, ACPI
System Memory: 8 GB capacity, 2 GB for Linux pre-installed; 1 slot of DDR3-1066/1333 SO-DIMM SDRAM
Expansion Bus: PCI/104 onboard (DPP models only)
USB: USB 2.0 hosts x 4, Type A connector, supports system boot up

Storage

Built-in: 8 GB for Linux (pre-installed in mSATA)
Storage Expansion: SATA 3.0 interface

Display

Graphics Controller: Intel® HD Graphics (Integrated)
Display Memory: Dynamic video memory (shares up to 32 MB of system memory)
Display Interface: 1 VGA output (DB15 female connector)
Resolution: CRT display mode with pixel resolution up to 2048 x 1536 at 75 Hz

Ethernet Interface

LAN: Auto-sensing 10/100/1000 Mbps ports x 6
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface

Serial Standards:
• 2 RS-232/422/485 ports (DB9 male)
• 10 RS-485 ports (terminal block)
ESD Protection: 15 kV for all signals
Surge Protection: 4 kV (DA-681A-I-DPP-T only)
Isolation: 2 kV digital galvanic isolation

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
Baudrate: 50 bps to 115.2 kbps

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

LEDs

System: Power, Storage
LAN: 100M x 6, 1000M x 6
Serial:
RS-232/422/485: 2 x Tx, 2 x Rx
RS-485: 10 x Tx, 10 x Rx
Programmable: 6 LEDs
Power Failure: LED x 2 (dual power models)

Switches and Buttons

Power Button: On/Off (on rear panel)
Reset Button: Hard Reset (on front panel)

Physical Characteristics

Housing: SECC sheet metal (1 mm)
Weight: 4.5 kg (10 lb)
Dimensions: 440 x 315 x 45 mm (17.32 x 12.40 x 1.77 in), 19-inch 1U height
Mounting: Standard 19-inch rackmount

Environmental Limits

Operating Temperature:
SP Models: -25 to 55°C (-13 to 131°F)
DPP Models: -25 to 55°C (-13 to 131°F)
DPP-T Models: -40 to 70°C (-40 to 158°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: 7 mm (2-9 Hz), 20 m/s/s (9-200 Hz), 15 m/s/s (200-500 Hz) @ IEC-61850-3, IEC 60870-2-2/Cm/(3M6)/(4M6), sine wave, 2-500 Hz, 1 Oct/min, 10 cycles, 2 hrs 40 mins per axis
Anti-Shock: 300 m/s2 @ IEC-61850-3, IEC 60870-2-2/Cm/(3M6)/(4M6), half sine wave, 11 ms

Power Requirements

Input Voltage: 100 to 240 VAC; 100 to 240 VDC
Input Current: 0.80 A @ 100 VAC; 0.41 A @ 100 VDC
Power Consumption: 25 W

Standards and Certifications

Safety: UL 60950-1, IEC 60950-1, EN 60950-1
Electrical Substation: IEC 61850-3, IEEE 1613, IEC 60255
Protection Relay: IEC 60255
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
IEC 61000-4-11
For DPP models only:
IEC 61000-4-16: 30 V / 300 V
IEC 61000-4-17: 10% nominal DC voltage
IEC 61000-4-18:
100 kHz: 25K VCM; 1 kv DIM
1 MHz: 2.5 kV CM; 1 kV DM
IEC 61000-4-29: 30% reduction, 0.1 sec.
Green Product: RoHS, CRoHS, WEEE

Reliability

Alert Tools:
• Built-in buzzer and RTC (real-time clock) with battery lithium backup
• Built-in 1 relay for visual/audio alarm.
Automatic Reboot Trigger: Built-in watchdog timer, configurable for restarts at 1 to 255 second intervals

MTBF (mean time between failures)

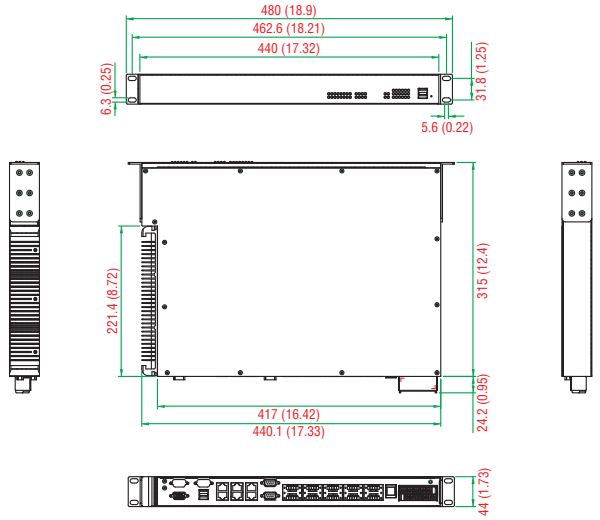
Time:
DA-681A-I-SP: 240,784 hrs
DA-681A-I-DPP: 215,436 hrs
DA-681A-I-DPP-T: 215,436 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

Warranty Period: 3 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Software Specifications

Linux

OS: Linux Debian 8, 64-bit
Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network
Kernel Version: GNU/Linux 3.16
System Shell: DASH (default), BASH
File System: EXT2, EXT3, EXT4
Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv2, ICMP, ARP, HTTP, CHAP,PAP,DHCP, NTP,NFS, SSH, PPP, SFTP, RSYNC, SSL
Programming Language Support: PHP, Perl, Python
Internet Security Suite: OpenVPN, iptables
Secure Shell for Remote Access: SSH allows remote logins to a secure encrypted console from any connected network
Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Linux standard API)

Windows Embedded Standard 7 (by CTOS)

Core OS:
• Windows 7 Embedded, 32-bit/64-bit
• Sensor and Location Platform
• Remote Procedure Call

Applications and Services Development:
• .Net Framework 3.5
• Remote Desktop Protocol 7.1
• COM OLE Application Support
• COM+ Application Support
• MSMQ
Internet Services:
• Internet Explorer 8.0
• IIS 7.0
File Systems and Data Storage:
• Windows Data Access Components
• Windows Backup and Restore
Diagnostics:
• Common Diagnostic Tools
• Problem Reports and Solutions
Fonts:
• Chinese (Trad. and Simp.), Middle East, South East Asian, South Asian Fonts
• True Type Fonts
Graphics and Multimedia:
• MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
• MPEG Layer-3 Audio Codecs(MP3)
• MPEG4 Decoders
• Windows Media Video VC-1 (WMV) Codecs
• DirectX and Windows Device Experience
• Windows Media Player 12
Management:
• Group Policy Management
• Windows Management Instrument (WMI)
• Windows Update

Networking:
• Extensible Authentication Protocol (EAP)
• Internet Authentication Service
• Telnet Server
• Bluetooth
• Domain Services
• Network Access Protection
• Network and Sharing Center
• Quality of Service
• Remote Access Service (RAS)
• Telephony API Client
• Windows Firewall
• Wireless Networking
Security:
• Credential Roaming Service
• Credentials and Certificate Management
• Windows Authorization Manager (AZMAN)
• Windows Security Center
• Active Directory Rights Management
• Security Base
• Encrypted File System (EFS)
Embedded Features:
• Enhanced Write Filter (EWF)
• File-Based Write Filter (FBWF)
• Message Box Default Reply
• Registry Filter
• WSDAPI for .NET
Embedded Self-Health Diagnostics: SNMP-based remote scripting layer for monitoring, reporting, and control

Ordering Information

Available Models

DA-681A-I-SP: 6 Ethernet ports, VGA, 2 RS-232/422/485 ports, 10 RS-485 ports, mSATA, SATA, USB, single power (RAM, mSATA, OS not included), -25 to 55°C operating temperature
DA-681A-I-SP-LX: 6 Ethernet ports, VGA, 2 RS-232/422/485 ports, 10 RS-485 ports, mSATA, SATA, USB, single power, Linux Debian 8, -25 to 55°C operating temperature
DA-681A-I-DPP: IEC 61850-3 computer with VGA, 6 LAN ports, 2 RS-232/422/485 ports, 10 RS-485 ports, mSATA, SATA, USB, dual power (RAM, mSATA, OS not included), -25 to 55°C operating temperature
DA-681A-I-DPP-LX: IEC 61850-3 computer with VGA, 6 LAN ports, 2 RS-232/422/485 ports, 10 RS-485 ports, mSATA, SATA, USB, dual power, Linux Debian 8, -25 to 55°C operating temperature
DA-681A-I-DPP-T: IEC 61850-3 computer with VGA, 6 LAN ports, 2 RS-232/422/485 ports, 10 RS-485 ports, mSATA, SATA, USB, dual power (RAM, mSATA, OS not included), -40 to 70°C operating temperature
DA-681A-I-DPP-T-LX: IEC 61850-3 computer with VGA, 6 LAN ports, 2 RS-232/422/485 ports, 10 RS-485 ports, mSATA, SATA, USB, dual power, Linux Debian 8, -40 to 70°C operating temperature
Note: To order a DA-681A system with a pre-installed W7E OS, please contact a Moxa sales representative.

Package Checklist

- DA-681A rackmount computer
- 19-inch rackmount kit
- Documentation CD or DVD
- Quick installation guide (printed)
- Warranty card

Recommended Configurations

Operating System	System Memory	mSATA for OS
Windows Embedded Standard 7 32 bit	≥ 4 GB	≥ 8 GB
Windows Embedded Standard 7 64 bit	≥ 4 GB	≥ 16 GB
Linux Debian 8	≥ 2 GB	≥ 4 GB

Comparison of DA-Series Models

Model Name	Serial Ports		Giga LAN Port	Storage			Expansion	System			Power	Relay	IEC 61850-3 IEEE/1613 IEC 60255
	3-in-1	RS-485		SATA	mSATA	USB	PCI-104 (for IRIG-B)	OS	RAM	mSATA			
DA-681A-I-SP	2	10	6	1	1	4	–	–	–	–	1	–	–
DA-681A-I-SP-LX	2	10	6	1	1	4	–	Linux	2G	8G	1	–	–
DA-681A-I-DPP	2	10	6	1	1	4	1	–	–	–	2	1	✓
DA-681A-I-DPP-LX	2	10	6	1	1	4	1	Linux	2G	8G	2	1	✓
DA-681A-I-DPP-T	2	10	6	1	1	4	1	–	–	–	2	1	✓
DA-681A-I-DPP-T-LX	2	10	6	1	1	4	1	Linux	2G	8G	2	1	✓

Optional Accessories

Model Name	Expansion Module	Accessory	
	DA-IRIGB-4DIO-PCI104-EMC4	USB Dongle	DA-681A HDD Kit
DA-681A-I-SP	–	✓	✓
DA-681A-I-SP-LX	–	✓	✓
DA-681A-I-DPP	✓	✓	✓
DA-681A-I-DPP-LX	✓	✓	✓
DA-681A-I-DPP-T	✓	✓	✓
DA-681A-I-DPP-T-LX	✓	✓	✓

Expansion Modules (can be purchased separately)

	Model	Description
	DA-IRIGB-4DIO-PCI104-EMC4	Time-synchronization expansion module, 1 IRIG-B signal input port, 3 digital inputs, 4 digital outputs (DA-681A-I-DPP series only)

Optional Accessories (can be purchased separately)

	Model	Description
	DA-681A HDD Kit	HDD/SSD installation package, supports single HDD/SSD.
	USB Dongle Kit	USB dongle kit installation package. This kit can be installed inside the DA-681A and is suited for security applications. For example, the license activate USB dongle for SCADA or the backup image storage for Smart Recovery.

DA-683 Series

x86 ready-to-run embedded computers with Intel Atom D510, DVI-I, 6 LANs, 2 serial ports, 4 DIs, 4 DOs, 4 USB 2.0 ports, CompactFlash, 2 peripheral expansion slots

- Intel Atom D510 1.66 GHz processor
- 1 DDR2 SO-DIMM socket, supporting DDR2 667 up to 2 GB (max.)
- 6 10/100/1000 Mbps Ethernet ports
- 2 RS-232 serial ports
- 4 USB 2.0 ports for high speed peripherals
- 4 DIs, 4 DOs
- CompactFlash socket for storage expansion
- 2 SATA interfaces for hard disk drive expansion
- 2 PCI expansion slots for inserting expansion modules
- IEC 61850-3 compliant (DPP-T models only)
- IEEE 1588 compliance for Precision Time Protocol (Linux models only)
- Dual power input models available
- Ready-to-run Embedded Linux, Windows Embedded Standard 2009, or Windows Embedded Standard 7 platform
- -40° to 70°C wide temperature models available

Overview

DA-683 industrial computers excel in a wide array of power automation applications. The DA-683 series is based on the Intel x86 processor and supports DVI-I, 6 gigabit Ethernet ports, 2 RS-232 serial ports, CompactFlash, and USB. They come standard in a 19-inch, 2U high form factor. The Intel Atom D510 processor gives the DA-683 enough punch to perform demanding industrial tasks without consuming a lot of power, for a highly cost-effective overall system. DA-683 computers are IEEE 1588 compliant and support precision time protocol and clock synchronization to provide the time accuracy required for event logging in power substation systems.

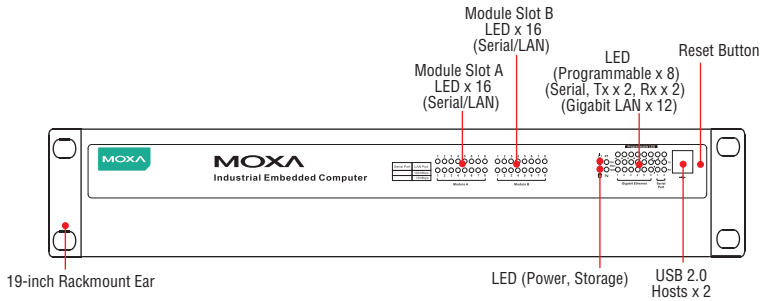
IEC-61850-3 compliance confirms that the DA-683 can deliver stable and reliable system operations in power applications. Additional value and convenience is provided through a modular design with two independent slots for flexible system integration and expansion. Users have the option to add a variety of different communications modules, including an 8-port RS-232/422/485 module, 8-port RS-422/485 module, 4-port 10/100 Mbps LAN module, 8-port 10/100 Mbps switch module, and a universal PCI expansion module.

The DA-683 series includes wide temperature models that operate reliably in a -40 to 70°C operating temperature range for the same great performance in applications in extremely harsh environments.

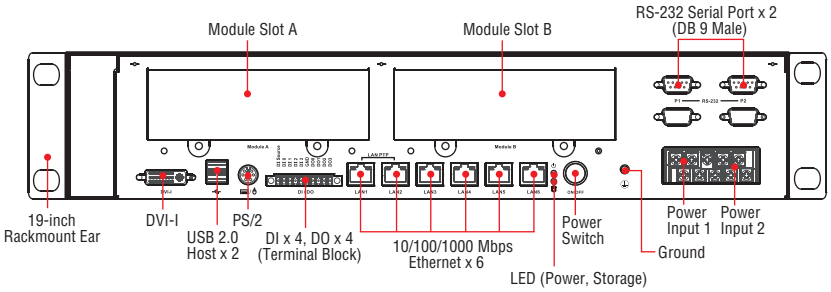
DA-683 computers run Linux, Windows Embedded Standard 2009, or Windows Embedded Standard 7 (pre-installed), providing a familiar environment for developing sophisticated application software. Moxa provides comprehensive software support to help programmers develop bug-free code quickly and at a lower cost.

Appearance

Front View



Rear View



Hardware Specifications

Computer

CPU: Intel Atom D510 1.66 GHz processor
OS: Linux, Windows Embedded Standard 2009, or Windows Embedded Standard 7
Note: The OS is pre-installed.
System Chipset: Intel Pineview-D + ICH8M
BIOS: 16 Mbit Flash BIOS, PCI Plug & Play, ACPI function support
FSB: 667 MHz
System Memory: 2 GB capacity, 1 GB (LX and XPE)/ 2 GB (W7E) pre-installed: 1 or 2 slots of 2 GB 200-pin DDR2-667 SO-DIMM
Expansion Bus: PCI/104 interface reserved
USB: USB 2.0 hosts x 4, Type A connector, supports system boot up

Storage

Built-in: 2 GB (LX and XPE) / 8 GB (W7E) industrial DOM onboard to store OS
Storage Expansion: CompactFlash socket for CF card expansion, supporting CF Type-I/II
HDD Support: 2 SATA connectors for drive expansion (with optional HDD kit)

Other Peripherals

KB/MS: 1 PS/2 interface, supports standard PS/2 keyboard and mouse through Y-type cable

Display

Graphics Controller: Intel® GMA3150 graphics controller in Intel D510 card
DVI Interface:
• Analog RBG display; output resolution up to 2048 x 1536 @ 60 Hz
• Digital DVI display; output resolution up to 1024 x 768 @ 60 Hz

Ethernet Interface

LAN: Auto-sensing 10/100/1000 Mbps ports x 6
Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 2 RS-232 ports (DB9 male)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND, RI

Digital Input

Input Channels: 4, source type
Input Voltage: 0 to 30 VDC
Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open
Digital Input Levels for Wet Contacts:
• Logic level 0: +3 V max.
• Logic level 1: +10 V to +30 V (source to DI)
Connector Type: 10-pin screw terminal block (4 DI points, 4 DO points, DI source, GND)
Isolation: 3 kV optical isolation

Digital Output

Output Channels: 4, sink type
Output Current: Max. 200 mA per channel
On-State Voltage: 24 VDC nominal, open collector to 30 V
Connector Type: 10-pin screw terminal block (4 DI points, 4 DO points, DI source, GND)
Isolation: 3 KV optical isolation

LEDs

System: Power, Storage
Gigabit LAN: 100M x 6, 1000M x 6
Serial: TX/RX
Programmable: LED x 8
Communication: Module A x 16, Module B x16

Switches and Buttons

Power Switch: on/off (on rear panel)
Reset Button: To reset system hardware (on front panel)

Physical Characteristics

Housing: SECC sheet metal (1 mm)
Weight: 4 kg (8.89 lb)
Dimensions: 315 x 440 x 90 mm (12.40 x 17.32 x 3.54 in) (without rackmount ears)
Mounting: Standard 19-inch rackmount

Environmental Limits

Operating Temperature:
Standard models: -10 to 60°C (14 to 140°F)
DPP-T models: -40 to 70°C (-40 to 158°F)
Storage Temperature:
Standard models: -20 to 80°C (-4 to 176°F)
DPP-T models: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: 7 mm (2-9 Hz), 20 m/s/s (9-200 Hz), 15 m/s/s (200-500 Hz) @ IEC-61850-3, IEC 60870-2-2/Cm/(3M6)/(4M6), sine wave, 2-500 Hz, 1 Oct/min, 10 cycles, 2 hrs 40 mins per axis
Anti-Shock: 300 m/s2 @ IEC-61850-3, IEC 60870-2-2/Cm/(3M6)/(4M6), half sine wave, 11 ms

Power Requirements

Input Voltage: 100 to 240 VAC, 50/60 Hz, 0.9-0.4 A
Power Consumption: 40 W

Standards and Certifications

Safety: UL/cUL (UL 60950-1, CSA C22.2 No. 60950-1-03), LVD (EN 60950-1), CCC (GB4943)
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8: 20 A/m
IEC 61000-4-9: 300 A/m
IEC 61000-4-11: (AC models only)
For DPP-T models only:
IEC 61000-4-16: 30 V / 300 V
IEC 61000-4-17: 10% nominal DC voltage
IEC 61000-4-18:
100 kHz: 25k VCM; 1 kV DIM
1 MHz: 2.5 kV CM; 1 kV DM
IEC 61000-4-29: 30% reduction, 0.1 sec.
Green Product: RoHS, CRoHS, WEEE

Reliability
Alert Tools: Built-in buzzer and RTC (real-time clock) with lithium backup battery
Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 level time interval system reset, software programmable

MTBF (mean time between failures)
Time: 135,852 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty
Warranty Period: 3 years
Details: See www.moxa.com/warranty

Software Specifications

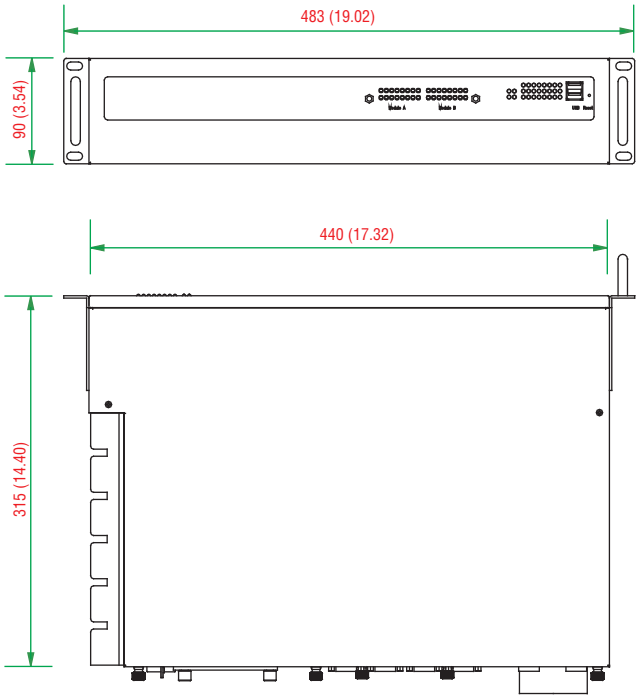
Linux
OS: Linux 2.6.18, Debian Etch 5
Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML
Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network
File System: EXT2, JFFS2
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE, PTP
Internet Security: OpenVPN, iptables firewall
Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).
File Server: Enables remote clients to access files and other resources over the network
Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)
Application Development Software:
• Moxa API Library (Watchdog timer, Moxa serial I/O control)
• GNU C/C++ cross-compiler
• GNU C library
• Perl

Windows Embedded Standard 7
Core OS:
• 32-bit support
• Remote Client
• Remote Procedure Call
Applications and Services Development:
• .Net Framework 3.5
• Remote Desktop Protocol 7.1
• COM OLE Application Support
• COM+ Application Support
• MSMQ
Internet Services:
• Internet Explorer 8.0
• IIS 7.0
File Systems and Data Storage:
• Windows Data Access Components
• Windows Backup and Restore
Diagnostics:
• Common Diagnostic Tools
• Problem Reports and Solutions
Fonts: Chinese (Trad. and Simp.), Japanese, Korean, Western, Middle Eastern, South East Asian, and South Asian Fonts
Graphics and Multimedia:
• MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
• MPEG Layer-3 Audio Codecs(MP3)
• MPEG4 Decoders
• Windows Media Video VC-1 (WMV) Codecs
• DirectX and Windows Device Experience
• Windows Media Player 12
International:
• IME Simplified Chinese Support
• IME Traditional Chinese Support
• IME Japanese Support
• IME Korean Support
Management:
• Group Policy Management
• Windows Management Instrument (WMI)
• Windows Update
Networking:
• Extensible Authentication Protocol (EAP)
• Internet Authentication Service
• Telnet Server
• Bluetooth
• Domain Services
• Network Access Protection
• Network and Sharing Center
• Quality of Service
• Remote Access Service (RAS)
• Telephony API Client
• Windows Firewall
• Wireless Networking
Security:
• Credential Roaming Service
• Credentials and Certificate Management
• Windows Authorization Manager (AZMAN)
• Windows Security Center
• Active Directory Rights Management
• Security Base
• Encrypted File System (EFS)
Embedded Features:
• Enhanced Write Filter (EWF)
• File-Based Write Filter (FBWF)
• Message Box Default Reply
• Registry Filter
• WSDAPI for .NET
Embedded Self-Health Diagnostics: SNMP-based remote scripting layer for monitoring, reporting, and control

Windows XP Embedded
OS: Windows Embedded Standard 2009
File System: NTFS
Internet Protocol Suite: DHCP, DNS, FTP, HTTP, SNTP, NTP, Telnet, SMTP, SNMPv2, TCP, UDP, IPv4, ICMP, IGMP, IPsec, TAPI, ICS, PPP, CHAP, EAP, PPPoE, PPTP, NetBIOS, PTP
Web Server (IIS): Allows users to create and manage websites
Remote Registry Service: Enables remote users to modify registry settings on this computer
Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)
Enhanced Write Filter: Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage
File-based Write Filter: Redirects all write requests directed at protected volumes to the overlay cache, which records and displays the changes while preserving the protected status of the target volume.
Application Development Software:
• Moxa API Library
• Microsoft .Net Framework 3.5 with SP1
• Active Directory Service Interface (ADSI) Core
• Active Template Library (ATL)
• Common Control Libraries
• Common File Dialogs
• Direct3D, DirectPlay, DirectShow, and Direct show filters
• Mapi32 Libraries
• Message Queuing (MSMQ) Core
• Microsoft Visual C++ Run Time Libraries
• Power Management dynamic-link library
• RPC
• Windows API, Script Engines, and WMI

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

DA-683-SP-XPE: x86 ready-to-run rackmount computer with 1.66 GHz CPU, DVI-I, 6 Giga LANs, 2 RS-232 serial ports, 4 DIs, 4 DOs, 2 peripheral expansion slots, CompactFlash, 4 USB ports, single power, Windows Embedded Standard 2009, -10 to 60°C operating temperature
DA-683-SP-LX: x86 ready-to-run rackmount computer with 1.66 GHz CPU, DVI-I, 6 Giga LANs, 2 RS-232 serial ports, 4 DIs, 4 DOs, 2 peripheral expansion slots, CompactFlash, 4 USB ports, single power, Linux, -10 to 60°C operating temperature
DA-683-SP-W7E: x86 ready-to-run rackmount computer with 1.66 GHz CPU, DVI-I, 6 Giga LANs, 2 RS-232 serial ports, 4 DIs, 4 DOs, 2 peripheral expansion slots, CompactFlash, 4 USB ports, single power, Windows Embedded Standard 7, -10 to 60°C operating temperature
DA-683-DPP-T-XPE: IEC 61850-3 x86 ready-to-run rackmount computer with 1.66 GHz CPU, DVI-I, 6 Giga LANs, 2 RS-232 serial ports, 4 DIs, 4 DOs, 2 peripheral expansion slots, CompactFlash, 4 USB ports, dual power, Windows Embedded Standard 2009, -40 to 70°C operating temperature
DA-683-DPP-T-LX: IEC 61850-3 x86 ready-to-run rackmount computer with 1.66 GHz CPU, VGA, 6 gigabit Ethernet Ports, 2 RS-232 serial ports, 4 DIs, 4 DOs, 2 peripheral expansion slots, CompactFlash, 4 USB ports, dual power, Linux, -40 to 70°C operating temperature
DA-683-DPP-T-W7E: IEC 61850-3 x86 ready-to-run rackmount computer with 1.66 GHz CPU, DVI-I, 6 Giga LANs, 2 RS-232 serial ports, 4 DIs, 4 DOs, 2 peripheral expansion slots, CompactFlash, 4 USB ports, dual power, Windows Embedded Standard 7, -40 to 70°C operating temperature

Package Checklist

- DA-683 embedded computer
- 19-inch rackmount kit
- Ethernet cable: RJ45-to-RJ45 cross-over cable, 100 cm
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

Expansion Modules (can be purchased separately)

DA-SP08-I-DB: 8-port RS-232/422/485 serial module with DB9 connector and digital isolation
DA-SP08-DB: 8-port RS-232/422/485 serial module with DB9 connector
DA-SP08-I-TB: 8-port RS-232/422/485 serial module with terminal block connector and digital isolation
DA-SP38-I-TB: 8-port RS-422/485 serial module with terminal block connector and digital isolation
DA-SW08-RJ: 8-port 10/100 Mbps unmanaged switch module
DA-LN04-RJ: 4-port 10/100 Mbps LAN module
DA-UPCI-DK: Universal PCI development kit
DA-FX04-MM-ST-T: 4-port (100BaseFX) fiber LAN module with multi-mode, ST connector, supports IP Teaming

Optional Accessories (can be purchased separately)

FK-76127-01: Hard disk installation package

DA-685 Series

x86 rackmount substation computers with VGA, 2 RS-232/422/485 and 6 RS-485 serial ports, 6 LAN Ports, CompactFlash, USB

- Intel Atom D510 1.66 GHz processor
- 1 DDR2 SO-DIMM sockets supporting DDR2 667 up to 2 GB (max.)
- 6 10/100/1000 Mbps Ethernet ports
- 2 RS-232/422/485 serial ports (DB9 male)
- 6 RS-485 serial ports (terminal block)
- 2 USB 2.0 ports for high speed peripherals
- CompactFlash socket for storage expansion
- 1 SATA interface for hard disk drive expansion
- EMC Level 4 certified

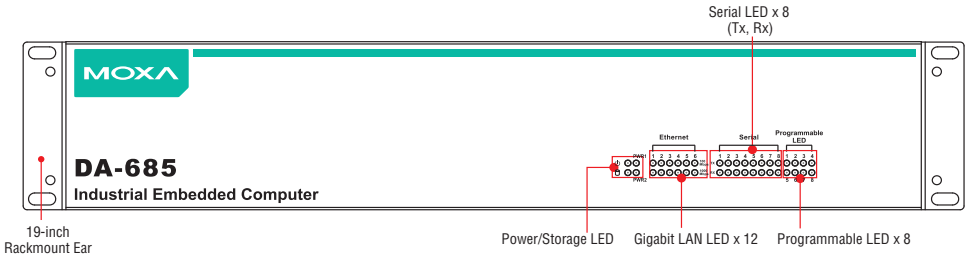
Overview

DA-685 industrial computers excel in a wide array of power automation applications. The DA-685 series is based on the Intel x86 processor and supports VGA, 6 gigabit Ethernet ports, 2 RS-232/422/485 and 6 RS-485 serial ports, CompactFlash, and USB. The computers come standard in a 19-inch, 2U high form factor, and the Intel Atom processor gives them enough punch to perform demanding industrial tasks without consuming a lot of power.

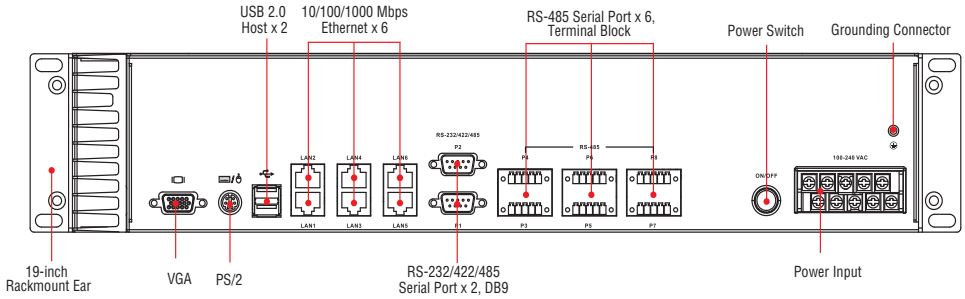
The DA-685 computer are pre-installed with Linux, Windows Embedded Standard 2009, or Windows Embedded Standard 7 operating systems, providing a familiar environment for developing sophisticated application software.

Appearance

Front View

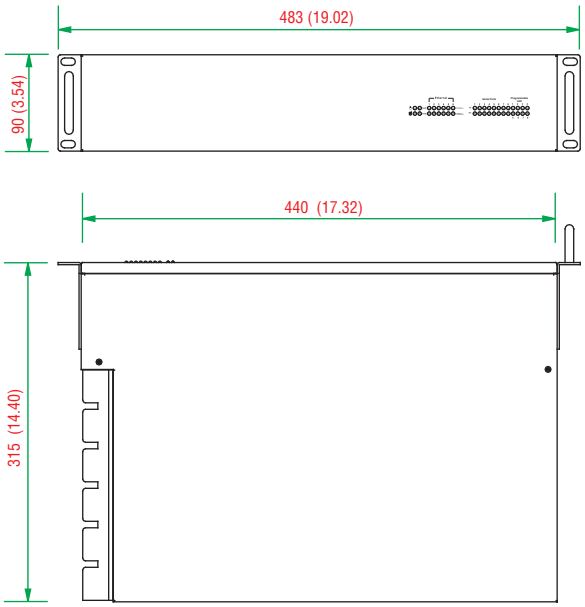


Rear View



Dimensions

Unit: mm (inch)



Hardware Specifications

Computer

CPU: Intel Atom D510 1.66 GHz processor
OS: Linux, Windows Embedded Standard 2009, or Windows Embedded Standard 7
System Chipset: Intel Pineview-D + ICH8M
BIOS: 16 Mbit Flash BIOS, PCI Plug & Play, ACPI function support
FSB: 667 MHz
System Memory: 2 GB capacity, 1 GB (LX and XPE)/ 2 GB (W7E) pre-installed: 1 or 2 slots of 2 GB 200-pin DDR2-667 SO-DIMM
Expansion Bus: PCI/104 interface reserved
USB: USB 2.0 hosts x 2, Type A connector, supports system boot up

Storage

Built-in: 2 GB (LX and XPE) / 8 GB (W7E) industrial DOM onboard to store OS
Storage Expansion: CompactFlash socket for CF card expansion, supporting CF Type-I/II
HDD Support: 1 SATA connector for drive expansion

Other Peripherals

KB/MS: 1 PS/2 interface, supports standard PS/2 keyboard and mouse through Y-type cable

Display

Graphics Controller: Intel® GMA3150 graphics controller on Intel D510 card
Display Interface: VGA output (DB15 female connector)
Resolution: CRT display mode with pixel resolution up to 2048 x 1536 at 75 Hz

Ethernet Interface

LAN: Auto-sensing 10/100/1000 Mbps ports x 6
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface

Serial Standards:
• 2 RS-232/422/485 ports (DB9 male)
• 6 RS-485-2W ports (terminal block)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND, RI
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

LEDs

System: Power, Storage
Gigabit LAN: 100M x 6, 1000M x 6
Serial: TX/RX
Programmable: LED x 8

Switches and Buttons

Power Switch: on/off (on rear panel)

Physical Characteristics

Housing: SECC sheet metal (1 mm)
Weight: 4 kg (8.89 lb)
Dimensions: 315 x 440 x 90 mm (12.40 x 17.32 x 3.54 in) (without rackmount ears)
Mounting: Standard 19-inch rackmount

Environmental Limits

Operating Temperature: -10 to 55°C (14 to 131°F)
Storage Temperature: -20 to 80°C (-4 to 176°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: 2 Grms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis
Anti-Shock: 20 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: 100 to 240 VAC, 50/60 Hz, 0.9-0.4 A
Power Consumption: 40 W

Standards and Certifications

Safety: LVD, UL, cUL, CCC
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GH: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8: 20 A/m
IEC 61000-4-9: 300 A/m
IEC 61000-4-11: (AC models only)
Green Product: RoHS, CRoHS, WEEE

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock) with lithium backup battery
Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 level time interval system reset, software programmable

MTBF (mean time between failures)

Time:
DA-685-W7E: 240,825 hrs
DA-685-LX: 168,379 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

Warranty Period: 3 years
Details: See www.moxa.com/warranty

Software Specifications

Linux

OS: Debian 5 Linux, Lenny; kernel 2.6.26
Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML
Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network
File System: EXT2, JFFS2
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE, PTP
Internet Security: OpenVPN, iptables firewall
Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).
File Server: Enables remote clients to access files and other resources over the network
Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)
Application Development Software:
• Moxa API Library (Watchdog timer, Moxa serial I/O control)
• GNU C/C++ cross-compiler
• GNU C library
• Perl

Windows Embedded Standard 7

Core OS:
• 32-bit support
• Remote Client
• Remote Procedure Call
Applications and Services Development:
• .Net Framework 3.5
• Remote Desktop Protocol 7.1
• COM OLE Application Support
• COM+ Application Support
• MSMQ
Internet Services:
• Internet Explorer 8.0
• IIS 7.0
File Systems and Data Storage:
• Windows Data Access Components
• Windows Backup and Restore
Diagnostics:
• Common Diagnostic Tools
• Problem Reports and Solutions
Fonts: Chinese (Trad. and Simp.), Japanese, Korean, Western, Middle Eastern, South East Asian, and South Asian Fonts
Graphics and Multimedia:
• MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
• MPEG Layer-3 Audio Codecs(MP3)
• MPEG4 Decoders
• Windows Media Video VC-1 (WMV) Codecs
• DirectX and Windows Device Experience
• Windows Media Player 12
International:
• IME Simplified Chinese Support
• IME Traditional Chinese Support
• IME Japanese Support
• IME Korean Support
Management:
• Group Policy Management
• Windows Management Instrument (WMI)
• Windows Update
Networking:
• Extensible Authentication Protocol (EAP)
• Internet Authentication Service
• Telnet Server
• Bluetooth
• Domain Services
• Network Access Protection
• Network and Sharing Center
• Quality of Service
• Remote Access Service (RAS)
• Telephony API Client
• Windows Firewall
• Wireless Networking
Security:
• Credential Roaming Service
• Credentials and Certificate Management
• Windows Authorization Manager (AZMAN)
• Windows Security Center
• Active Directory Rights Management
• Security Base
• Encrypted File System (EFS)
Embedded Features:
• Enhanced Write Filter (EWF)
• File-Based Write Filter (FBWF)
• Message Box Default Reply
• Registry Filter
• WSDAPI for .NET
Embedded Self-Health Diagnostics: SNMP-based remote scripting layer for monitoring, reporting, and control

Windows XP Embedded

OS: Windows Embedded Standard 2009
File System: NTFS
Internet Protocol Suite: HCP, DNS, FTP, HTTP, SNTP, NTP, Telnet, SMTP, SNMPv2, TCP, UDP, IPv4, ICMP, IGMP, IPsec, TAPI, ICS, PPP, CHAP, EAP, PPPoE, PPTP, NetBIOS, PTP
Web Server (IIS): Allows users to create and manage websites
Remote Registry Service: Enables remote users to modify registry settings on this computer
Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)
Enhanced Write Filter: Redirect disk write operations to volatile(RAM) or non-volatile (disk) storage
File-based Write Filter: Redirects all write requests directed at protected volumes to the overlay cache, which records and displays the changes while preserving the protected status of the target volume.

Application Development Software:
- Moxa API Library
- Microsoft .Net Framework 3.5 with SP1
- Active Directory Service Interface (ADSI) Core
- Active Template Library (ATL)
- Common Control Libraries
- Common File Dialogs
- Direct3D, DirectPlay, DirectShow, and Direct show filters
- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- RPC
- Windows API, Script Engines, and WMI

Ordering Information

Available Models

DA-685-XPE: x86 rackmount computer with 1.66 GHz CPU, VGA, 6 gigabit Ethernet ports, 2 RS-232/422/485 and 6 2-wire RS-485 ports, CompactFlash, 2 USB ports, single power input, Windows Embedded Standard 2009
DA-685-LX: x86 rackmount computer with 1.66 GHz CPU, VGA, 6 gigabit Ethernet ports, 2 RS-232/422/485 and 6 2-wire RS-485 ports, CompactFlash, 2 USB ports, single power input, Linux
DA-685-W7E: x86 rackmount computer with 1.66 GHz CPU, VGA, 6 gigabit Ethernet ports, 2 RS-232/422/485 and 6 2-wire RS-485 ports, CompactFlash, 2 USB ports, single power input, Windows Embedded Standard 7

Optional Accessories (can be purchased separately)

FK-12072-01: Hard disk installation package (8 screws, 4 brass standoffs, 1 SATA cable, 1 hard disk mounting bracket)

Package Checklist

- DA-685 embedded computer
- 19-inch rackmount kit
- Ethernet cable: RJ45-to-RJ45 cross-over cable, 100 cm
- Documentation CD or DVD
- Quick installation guide (printed)
- Warranty card

DA-662A Series

RISC 19-inch rackmount data acquisition computers with 8 to 16 serial ports, 4 Ethernet ports, USB

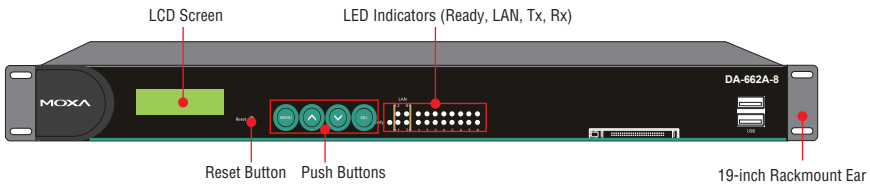
- MoxaMacro 500 MHz processor
- 128 MB RAM onboard, 32 MB flash
- 8 to 16 software-selectable RS-232/422/485 serial ports
- 8 to 16 jumper-configurable 1/150 kΩ pull low/high and 120 ohm termination resistors
- 15 kV ESD protection for all serial signals
- Quad 10/100 Mbps Ethernet ports
- USB and CF slots for storage expansion supported
- Standard 19-inch rackmount installation, 1U height
- Wide range of power input voltages from 100 to 240 VAC
- LCM display and keypad for HMI
- Ready-to-Run Linux OS platform
- Robust, fanless design
- Isolated serial port protection models available

Overview

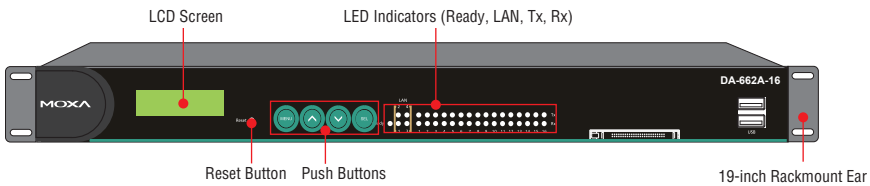
The DA-662A RISC-based, ready-to-run embedded computers are designed for industrial data acquisition applications. The computers have 8 to 16 RS-232/422/485 serial ports, 4 Ethernet ports, and 2 USB 2.0 ports, all based on the MoxaMacro communication processor. In addition, the DA-662A-I-8/16-LX's serial ports come with high level interference protection. The housing is a standard 1U, 19-inch wide rack-mounted rugged enclosure. The robust, rack-mountable mechanism design provides the hardened protection needed for industrial environment applications, and makes it easy for users to install the DA-662A computers on a standard 19-inch rackmount. The DA-662A computers are ideal for applications that require a distributed embedded technology, such as SCADA systems, plant floor automation, and power electricity monitoring applications.

Appearance

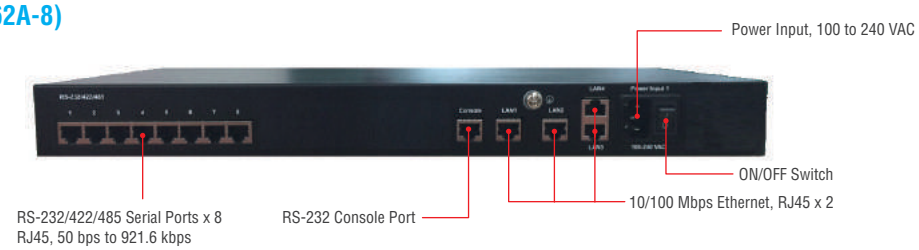
Front View (DA-662A-8)



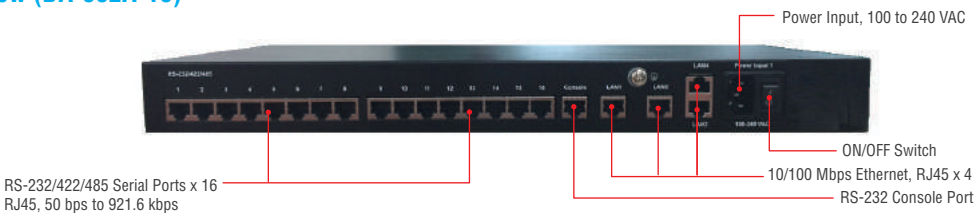
Front View (DA-662A-16)



Rear View (DA-662A-8)



Rear View (DA-662A-16)



Hardware Specifications

Computer
CPU: MoxaMacro 500 MHz
OS: Embedded Linux (pre-installed)
DRAM: 128 MB onboard
Flash: 32 MB onboard

Ethernet Interface
LAN: Auto-sensing 10/100 Mbps ports (RJ45) x 4
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface
Serial Standards: 8 to 16 RS-232/422/485 ports, software selectable (8-pin RJ45)
ESD Protection: 8 kV contact, 15 kV Air ESD protection for all signals
Surge Protection: 2 kV line-to-line and 4 kV line-to-ground surge protection, 8/20 μs waveform (DA-662A-I-8/16-LX only)
Insulation: 500 V (DA-662A-I-8/16-LX only)
Isolation: 2 kV digital isolation (DA-662A-I-8/16-LX only)
Termination Resistor: 120 ohm, jumper selectable
Console Port: RS-232 (all signals), RJ45 connector

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals
RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
(DA-662A-I-8/16-LX only: TxD, RxD, RTS, CTS, GND)
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

LEDs
System: OS Ready
LAN: 10/100M x 4
Serial: TxD, RxD (16 of each)

Mini Screen with Push Buttons
LCD Panel: Liquid Crystal Display on the case, 2 x 16 text mode
Push Buttons: Four membrane buttons for convenient on-site configuration

Physical Characteristics
Housing: SECC sheet metal (1 mm)
Weight: 4.3 kg (9.56 lb)
Dimensions:
Without ears: 440 x 45 x 237 mm (17.32 x 1.77 x 9.33 in)
With ears: 480 x 45 x 237 mm (18.90 x 1.77 x 9.33 in)
Mounting: Standard 19-inch rackmount

Environmental Limits
Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -20 to 80°C (-4 to 176°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: 1 g @ IEC-68-2-6, sine wave (resonance search), 5-500 Hz, 1 Oct/min, 1 Cycle, 13 mins 17 sec per axis

Power Requirements
Input Voltage: 100 to 240 VAC auto ranging
(47 to 63 Hz for AC input)
Power Consumption: 20 W

Standards and Certifications
Safety: UL 60950-1
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 4 kV
IEC 61000-4-6 CS: Signal: 3 V/m
IEC 61000-4-8 1 A/m
IEC 61000-4-11
Green Product: RoHS, CRoHS, WEEE

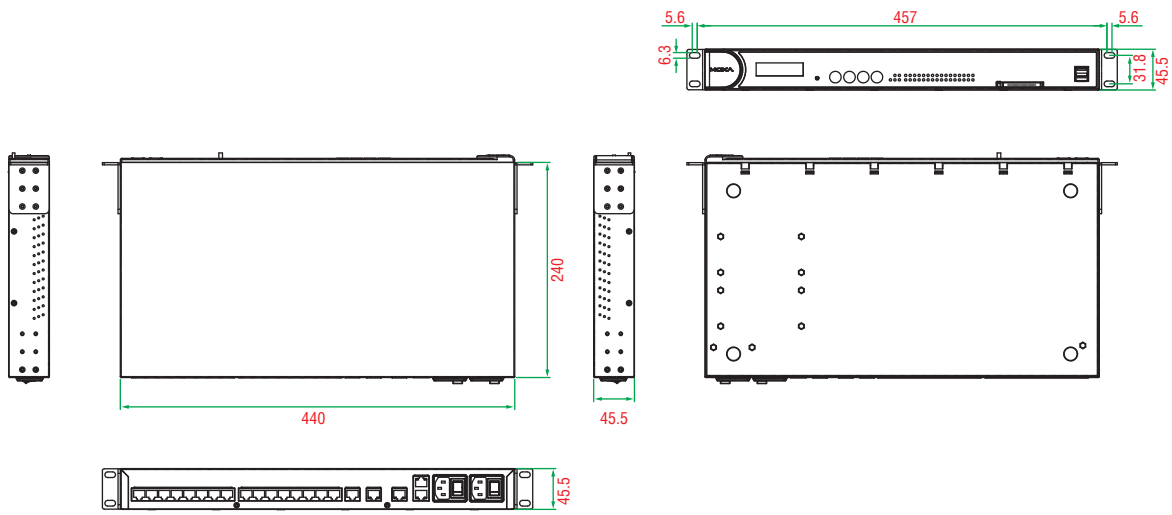
Reliability
Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)
Time:
DA-662A-8-LX: 272,913 hrs
DA-662A-16-LX: 177,580 hrs
DA-662A-16-DP-LX: 177,260 hrs
DA-662A-I-8-LX: 268,332 hrs
DA-662A-I-16-LX: 189,455 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Software Specifications

Linux

OS: Linux 2.6.38.8
Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML
Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network
File System: JFFS2 (on-board flash)
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE, SNMP v1/v2, SSL, OpenVPN
Internet Security: iptables firewall
Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).
File Server: Enables remote clients to access files and other resources over the network
Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)
Application Development Software:
• Moxa API Library (Watchdog timer, LCM, keypad, Moxa serial I/O control)
• GNU C/C++ cross-compiler
• GNU C library

Ordering Information

Available Models

DA-662A-8-LX: RISC-based 19-inch rackmount data acquisition computer with 8 serial ports, quad LANs, USB, Linux OS
DA-662A-16-LX: RISC-based 19-inch rackmount data acquisition computer with 16 serial ports, quad LANs, USB, Linux OS
DA-662A-16-DP-LX: RISC-based 19-inch rackmount data acquisition computer with 16 serial ports, quad LANs, USB, Linux OS, dual power inputs
DA-662A-I-8-LX: RISC-based 19-inch rackmount data acquisition computer with 8 serial ports (isolation protection), quad LANs, USB, Linux OS
DA-662A-I-16-LX: RISC-based 19-inch rackmount data acquisition computer with 16 serial ports (isolation protection), quad LANs, USB, Linux OS

Package Checklist

- DA-662A embedded computer
- 19-inch rackmount kit
- Ethernet cable: RJ45-to-RJ45 cross-over cable, 100 cm
- CBL-RJ45F9-150: 8-pin RJ45 to DB9 female console port cable, 150 cm
- CBL-RJ45M9-150: 8-pin RJ45 to DB9 male serial port cable, 150 cm
- 6 jumper caps
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Model Name	RS-232/422/485 Serial Port	RS-485 2-wire Serial Port only	10/100 Mbps LAN Port	Storage Expansion	Serial port protection
DA-662A-8-LX	8	–	4	2 USB ports, CF slot	15 kV Air ESD protection
DA-662A-16-LX	16	–	4	2 USB ports, CF slot	15 kV Air ESD protection
DA-662A-16-DP-LX	16	–	4	2 USB ports, CF slot	15 kV Air ESD protection
DA-662A-I-8-LX	4	4	4	2 USB ports, CF slot	Isolation: 2 kV digital isolation ESD Protection: 8 kV contact, 15 kV Air ESD protection Surge Protection: 2 kV line-to-line and 4 kV line-to-ground surge protection, 8/20 μs
DA-662A-I-16-LX	4	12	4	2 USB ports, CF slot	Isolation: 2 kV digital isolation ESD Protection: 8 kV contact, 15 kV Air ESD protection Surge Protection: 2 kV line-to-line and 4 kV line-to-ground surge protection, 8/20 μs

Accessories (can be purchased separately)

Model		Description
	PWC-C13US-3B-183 10A/125V	US-type power supply cord
	PWC-C13EU-3B-183 10A/250V	EU-type power supply cord
	PWC-C13CN-3B-183 10A/250V	CN-type power supply cord
	PWC-C13UK-3B-183 10A/250V	UK-type power supply cord
	PWC-C13AU-3B-183 10A/250V	AU-type power supply cord

DA-710 Series

x86 embedded computers with 2 serial ports, quad LANs, VGA, 4 DIs, 4 DOs, USB, and 4 peripheral expansion slots

- Intel Core 2 Duo T7500 2.2 GHz processor
- 1 socket of 2GB DDR2-533/667 SODIMM SDRAM
- 4 PCI slots for expansion modules
- Quad 10/100/1000 Mbps Ethernet for network redundancy
- 1 CompactFlash socket, 1 IDE, and 2 serial ATA-150 connectors for storage expansion
- 4 USB 2.0 ports for high speed peripherals
- 4 DIs, 4 DOs
- Ready-to-Run Linux or Windows Embedded Standard 2009 platform
- 19-inch rackmount model, 4U high
- Fanless design
- Dual 100/240 VAC/VDC power input

Overview

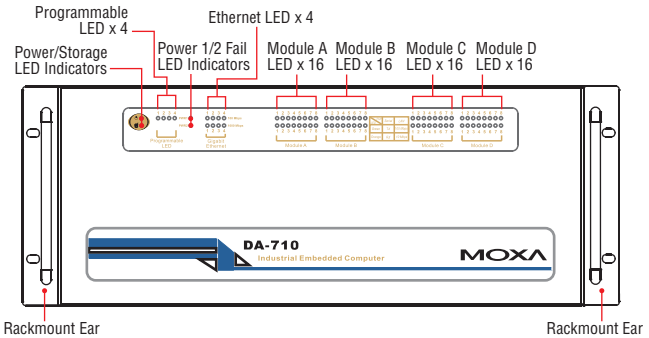
The DA-710 computer is based on the Intel x86 processor, supports VGA, and comes with 4 Ethernet ports, 2 RS-232 serial ports, CompactFlash, and USB. The DA-710 comes in a standard 19-inch, 4U high form factor, making it an ideal platform for industrial applications.

The DA-710 comes with 4 PCI slots for inserting expansion modules. Moxa provides a variety of communication modules, including an 8-port RS-232/422/485 module, a 4-port 10/100 Mbps LAN module, an 8-port RS-422/485 module, an 8-port switch module, and a universal PCI expansion module. The friendly modular design gives users the advantage of being able to swap out modules quickly and easily.

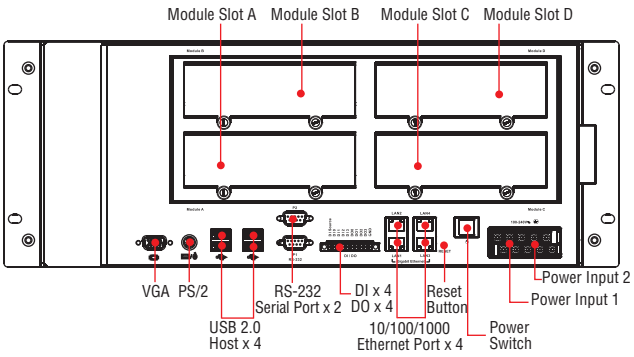
The DA-710 runs Linux, or Windows Embedded Standard 2009 (pre-installed), providing a friendly environment for developing sophisticated application software. The great software support that Moxa provides makes the programmer's job easier, and helps programmers develop bug-free code quickly and at a lower cost.

Appearance

Front View

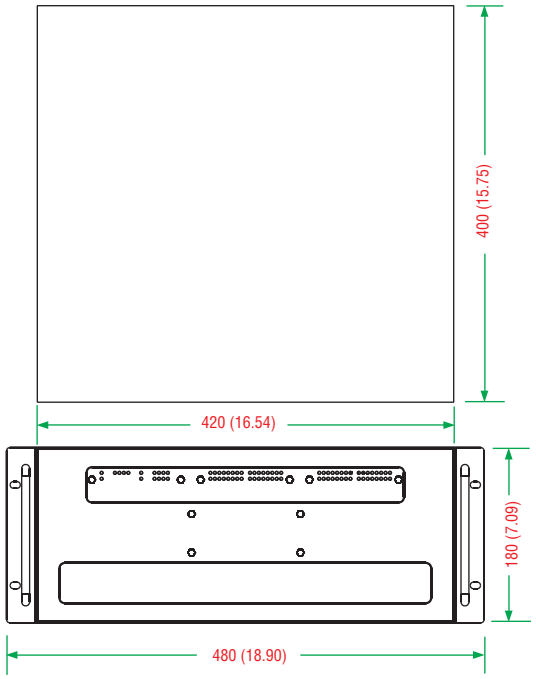


Rear View



Dimensions

Unit: mm (inch)



Hardware Specifications

Computer

CPU: Intel Core 2 Duo T7500 2.2 GHz processor
OS: Windows Embedded Standard 2009, Linux 2.6
Note: The OS is pre-installed.
System Chipset: Intel GME965 + ICH8M
BIOS: 8 Mbit SPI Serial Flash, PCI Plug & Play, ACPI function support
FSB: 800 MHz
System Memory: 2 GB capacity, 1 GB pre-installled: 1 slot of DDR2-533/667 200-pin SO-DIMM SDRAM
USB: USB 2.0 hosts x 4, Type A connector, supports system boot up

Storage

Built-in: 2 GB industrial DOM onboard to store OS
Storage Expansion: CompactFlash socket
HDD Support: 2 x SATA connector, 1 x IDE connector

Other Peripherals

KB/MS: 1 PS/2 interface, supports standard PS/2 keyboard and PS/2 mouse

Display

Graphics Controller: Integrated Intel graphics media accelerator (GMA X3100)
Display Memory: Dynamic video memory technology
Intel Clear Video Technology: MPEG-2 hardware accelerator, Microsoft DirectX 9
Display Interface: CRT interface for VGA output (DB15 female connector)
Resolution: QXGA maximum with resolution up to 2048 x 1536 at 60 Hz

Ethernet Interface

LAN: Auto-sensing 10/100/1000 Mbps ports (RJ45) x 4
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface

Serial Standards: 2 RS-232 ports (DB9 male)
ESD Protection: 4 kV for all signals

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: XON/XOFF
Baudrate: 50 bps to 115.2 kbps

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

Digital Input

Input Channels: 4, source type
Input Voltage: 0 to 30 VDC
Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open
Digital Input Levels for Wet Contacts:
• Logic level 0: +3 V max.
• Logic level 1: +10 to +30 V (DI Source to DI)
Connector Type: 6-pin screw terminal block (4 points, DI Source, GND)
Isolation: 4 kV optical isolation

Digital Output

Output Channels: 4, sink type
Output Current: Max. 200 mA per channel
On-State Voltage: 24 VDC nominal, open collector to 30 V
Connector Type: 5-pin screw terminal block (4 points, GND)
Isolation: 4 kV optical isolation

LEDs

System: Power x 1, Storage x 1
LAN: 100M x 4, 1000M x 4
Programmable: LED x 4
Power Failure: LED x 2
Module: Module A x 16, Module B x 16, Module C x 16, Module D x 16

Physical Characteristics

Housing: SECC sheet metal (1 mm)
Weight: 14 kg (31.11 lb)
Dimensions:
• Without ears: 400 x 420 x 180 mm (15.75 x 16.54 x 7.09 in)
• With ears: 400 x 480 x 180 mm (15.75 x 18.90 x 7.09 in)
Mounting: Standard 19-inch rackmount

Environmental Limits
Operating Temperature: -10 to 50°C (14 to 122°F)
Storage Temperature: -20 to 80°C (4 to 176°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements
Input Voltage: Single or dual inputs, 100 to 240 VAC/VDC auto-ranging, 47 to 63 Hz, terminal block
Power Consumption: 60 W

Standards and Certifications
Safety: UL 60950-1, CSA C22.2 No. 60950-1-07, CCC (GB4943, GB9254, GB17625.1)
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8: 20 A/m
IEC 61000-4-9: 300 A/m
IEC 61000-4-11: (AC models only)
Green Product: RoHS, CRoHS, WEEE

Reliability
Alert Tools: Built-in buzzer and RTC (real-time clock) with backup lithium battery
Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 time interval levels for system reset, software programmable

MTBF (mean time between failures)
Time: 118,815 hrs
Standard: Telcordia (Bellcore) Standard SR-332

Warranty
Warranty Period: 3 years
Details: See www.moxa.com/warranty

Software Specifications

Linux
OS: Linux 2.6.26, Debian 5 (Lenny)
Web Server (Apache): Allows you to create and manage Web sites, supporting PHP and XML
Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network.
File System: EXT2
Internet Protocol Suite: TCP, UDP, IPv4, SNMP v1/v2c/v3, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: iptables firewall, OpenVPN
Dial-up Networking: PPP Daemon for Linux allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP and (for Linux) IPX (Novell).
File Server: Enables remote clients to access files and other resources over the network
Watchdog: Features a software function to trigger system reset in a user specified time interval (Moxa API provided)
Application Development Software:
• Moxa API Library
• GNU C/C++ compiler
• GNU C library

Windows XP Embedded
OS: Windows Embedded Standard 2009
File System: NTFS
Internet Protocol Suite: DHCP, DNS, FTP, HTTP, SNTP, NTP, Telnet, SMTP, SNMPv2, TCP, UDP, IPv4, ICMP, IGMP, IPsec, TAPI, ICS, PPP, CHAP, EAP, PPPoE, PPTP, NetBIOS
Web Server (IIS): Allows users to create and manage websites
Silverlight 2.0: A free runtime that powers rich application experiences and delivers high quality, interactive video across multiple platforms and browsers, using the .NET framework
Remote Desktop: The Terminal Server Remote Desktop component provides remote access for the desktop of a computer running Terminal Services
Remote Registry Service: Enables remote users to modify registry settings on this computer
Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)
Enhanced Write Filter: Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage
Application Development Software:
• Moxa API Library
• Microsoft .Net Framework 3.5 with SP1
• Active Directory Service Interface (ADSI) Core
• Common Control Libraries
• Common File Dialogs
• Direct3D, DirectPlay, DirectShow, and Direct show filters
• Mapi32 Libraries
• Message Queuing (MSMQ) Core
• Microsoft Visual C++ Run Time Libraries
• Power Management dynamic-link library
• RPC
• Windows API, Script Engines, and WMI

Ordering Information

Available Models
DA-710-XPE: x86-based rackmount embedded computer with 2 RS-232 ports, 4 LANs, 4 peripheral expansion slots, 4 DIs, 4 DOs, VGA, CompactFlash, USB, Windows Embedded Standard 2009
DA-710-LX: x86-based rackmount embedded computer with 2 RS-232 ports, 4 LANs, 4 peripheral expansion slots, 4 DIs, 4 DOs, VGA, CompactFlash, USB, Linux 2.6

Expansion Modules (can be purchased separately)
DA-SP08-I-DB: 8-port RS-232/422/485 serial module with DB9 connector and digital isolation
DA-SP08-DB: 8-port RS-232/422/485 serial module with DB9 connector
DA-SP08-I-TB: 8-port RS-232/422/485 serial module with terminal block connector and digital isolation
DA-SP38-I-TB: 8-port RS-422/485 serial module with terminal block connector and digital isolation
DA-SW08-RJ: 8-port 10/100 Mbps unmanaged switch module
DA-LN04-RJ: 4-port 10/100 Mbps LAN module
DA-UPCI-DK: Universal PCI development kit
DA-FX04-MM-ST-T: 4-port (100BaseFX) fiber LAN module with multi-mode, ST connector, supports IP Teaming

Optional Accessories (can be purchased separately)
FK-12072-01: Hard disk installation package (8 screws, 4 brass standoffs, 1 SATA cable, 1 hard disk mounting bracket)

Package Checklist
- DA-710 embedded computer
- 19-inch rackmount kit
- Ethernet cable: RJ45-to-RJ45 cross-over cable, 100 cm
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

DA Series Expansion Modules

Expansion modules with time-synchronization ports, RS-232/422/485 and RS-232/485 serial ports, 10/100 Mbps LAN and unmanaged switch ports, 100 Mbps fiber LAN ports, and PCI development kit

- IRIG-B time-synchronization module
- Universal PCI expansion module
- 4-port 10/100 Mbps LAN module
- 4-port 100 Mbps Fiber LAN module
- 8-port 10/100 Mbps unmanaged switch module
- 8-port RS-422/485 serial module with terminal block connectors
- 8-port RS-232/422/485 software-selectable serial modules with isolation protection
- Fully compatible with Moxa embedded computers that have peripheral expansion slots

Overview

Moxa's peripheral expansion modules, which come with serial ports, LAN ports, switch ports, fiber ports, time-synchronization IRIG-B ports, and PCI slots, give end-users the greatest flexibility for setting up industrial applications and are fully compatible with Moxa's embedded computers that have perpheral expansion slots.

The serial port modules include an 8-port RS-232/422/485 module with either DB9 or terminal block connectors, and an 8-port RS-422/485 module with terminal block connectors. Some modules are even designed with 2 kV digital isolation, making them fully suitable for the great demands of industrial applications that use serial communication.

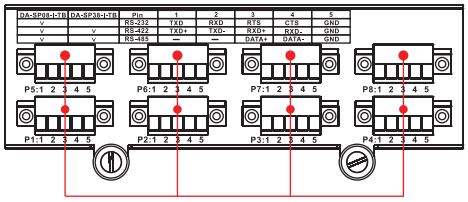
In addition, a 4-port LAN module, 8-port switch module, and 4-port fiber LAN module are available for setting up industrial communication applications with Ethernet-based devices. A universal PCI development kit is also available for PCI-based devices for expanding industrial applications at a reasonable cost.

The time-synchronization module features 3 digital inputs and 4 digital outputs and provides precision timing information using IRIG-B input signals. The module is designed for embedded computers that support the PCI/104 interface.

All modules are designed to offer the greatest flexibility for setting up applications and performing industrial tasks. In particular, users can swap out modules quickly and easily.

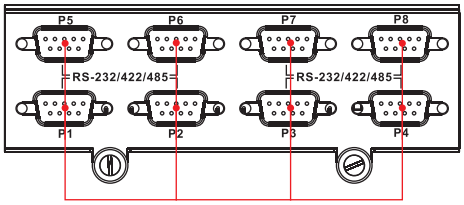
Appearance

DA-SP08-I-TB/DA-SP08-I-EMC4-TB



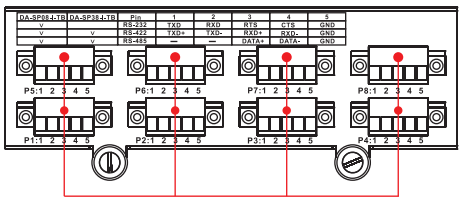
RS-232/422/485 Serial Port x 8

DA-SP08-DB/DA-SP08-I-DB/DA-SP08-I-EMC4-DB



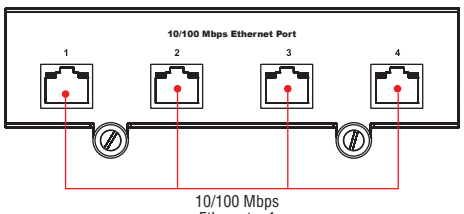
RS-232/422/485
Serial Port x 8

DA-SP38-I-TB



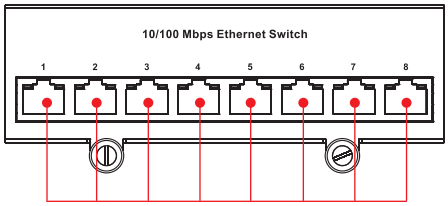
RS-422/485 Serial Port x 8

DA-LN04-RJ



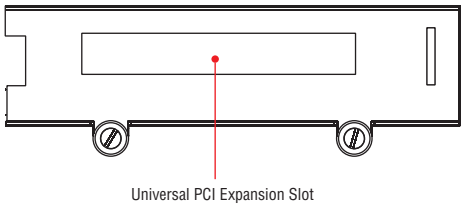
10/100 Mbps
Ethernet x 4

DA-SW08-RJ

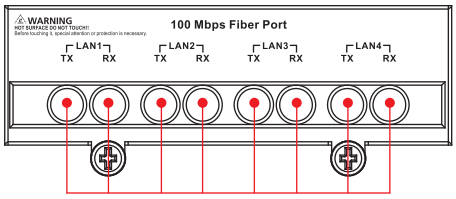


10/100 Mbps Switch Port x 8

DA-UPCI-DK

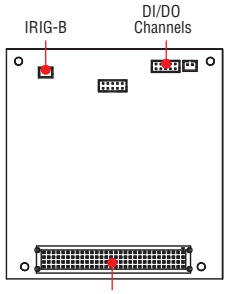

Universal PCI Expansion Slot

DA-FX04-MM-ST-T



Fiber LAN Port x 4

DA-IRIGB-4DIO-PCI104-EMC4



PCI-104 Connector

DA-IRIGB-4DIO-PCI104-EMC4 Hardware Specifications

Hardware
Communication Controller: FPGA Cyclone V
Form Factor: PCI/104

Time Code Input
IRIG-B: Based on the IRIG STANDARD 200-04 and IEEE 1344

Precision and Accuracy
Accuracy (Time Synchronization): ±1 µs
Accuracy (Free Running): ±500 ms @ 24 hr

Input Signals
Single Level:
• Open: High
• Short to GND:> Low
• Level Input: 5 to 12 V
Differential Level:
• D+ - D- > 0.2 V, RXD is High
• D+ - D- < -0.2 V, RXD is Low
• Level Input: 5 V

Interface
IRIG-B: 2-pin wafer to DB9
DI/DO: 10-pin wafter to DB9

Protection
ESD Protection: 8 kV contact, 15 kV Air ESD protection
Surge Protection: 2 kV line-to-line and 4 kV line-to-ground surge protection, 8/20 µs waveform
Insulation: 500 V

Digital Input
Input Channels: 3, source type
Input Voltage: 0 to 30 VDC
Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open
Digital Input Levels for Wet Contacts:
• Logic level 0: +3 V max.
• Logic level 1: +10 V to +30 V (source to DI)
Isolation: 3 kV optical isolation
Connector Type: DB9 male

Digital Output
Output Channels: 4, sink type
Output Current: Max. 200 mA per channel
On-state Voltage: 24 VDC nominal, open collector to 30 V
Isolation: 3 kV optical isolation
Connector Type: Male

Operating Systems
Windows: Windows 7E
Linux: Debian 7

Physical Characteristics
Dimensions: 90 x 96 mm (3.54 x 3.78 in)

Environmental Limits
Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Altitude: Up to 2000 m

Standards and Certifications
EMC: CE, FCC
EMI: EN 55022, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class A
EMS:
IEC 61000-4-2 ESD: Contact 8 kV; Air 15 kV
IEC 61000-4-3 RS: 10 V/m (80 MHz to 1 GHz)
IEC 61000-4-4 EFT: Signal 4 kV
IEC 61000-4-5 Surge: Signal 4 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Green Product: RoHS, CRoHS, WEEE

DA-SP08-DB, DA-SP08-I-DB, DA-SP08-I-TB Hardware Specifications

Serial Interface
Serial Standards: 8 RS-232/422/485 ports, software selectable (DB9 male or terminal block connector)
ESD Protection: 15 kV for all signals
Isolation: 2 kV digital isolation (DA-SP08-I-DB and DA-SP08-I-TB only)

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals
RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Physical Characteristics
Weight: 290 g (0.64 lb)
Dimensions: 130 x 150 x 42 mm (5.12 x 5.91 x 1.65 in)
MTBF (mean time between failures): 1,753,143 hrs

DA-SP08-I-EMC4-DB/TB Hardware Specifications

Serial Interface
Serial Standards: 8 RS-232/422/485 ports, software selectable (DB9 male or terminal block connector)
ESD Protection: 8 kV contact, 15 kV air
Surge Protection: 2 kV line-to-line and 4 kV line-to-ground surge protection, 8/20 μs waveform
Insulation: 500 V
Isolation: 2 kV digital isolation
Pull low/high: 1k/150k, jumper selectable
Termination Resistor: 120 ohms, jumper selectable

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals
RS-232: TxD, RxD, RTS, CTS, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Physical Characteristics
Weight: 500 g (1.11 lb)
Dimensions: 130 x 150 x 42 mm (5.12 x 5.91 x 1.65 in)
MTBF (mean time between failures): 1,753,143 hrs

DA-SP38-I-TB Hardware Specifications

Serial Interface
Serial Standards: 8 RS-422/485 ports, software selectable (DB9 male or terminal block connector)
ESD Protection: 15 kV for all signals
Isolation: 2 kV digital isolation

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Physical Characteristics
Weight: 245 g (0.54 lb)
Dimensions: 130 x 150 x 42 mm (5.12 x 5.91 x 1.65 in)

DA-LN04-RJ Hardware Specifications

Ethernet Interface
LAN: 4 auto-sensing 10/100 Mbps ports (RJ45)
Magnetic Isolation Protection: 1.5 kV built-in

Physical Characteristics
Weight: 198 g (0.44 lb)
Dimensions: 132 x 150 x 42 mm (5.20 x 5.91 x 1.65 in)

DA-SW08-RJ Hardware Specifications

Ethernet Interface
LAN: 8 auto-sensing 10/100 Mbps unmanaged Ethernet switch ports (RJ45)
Magnetic Isolation Protection: 1.5 kV built-in

Physical Characteristics
Weight: 200 g (0.44 lb)
Dimensions: 132 x 150 x 42 mm (5.20 x 5.91 x 1.65 in)

DA-UPCI-DK Hardware Specifications

Universal PCI Expansion Adatper
PCI Slots: 1
Interface Bus: 32-bit Universal PCI (3.3 V and 5 V)

Physical Characteristics
Weight: 195 g (0.43)
Dimensions: 132 x 150 x 42 mm (5.20 x 5.91 x 1.65 in)
MTBF (mean time between failures): 11,053,266 hrs

DA-FX04-MM-ST-T Hardware Specifications

Fiber Interface

Number of Ports: 4 (100BaseFX)
Fiber Mode: Multi-mode
Connector Type: ST
Optical Wavelength: 0 to 2 km, 1310 nm (62.5/125 µm, 500 MHz*km)
Min-TX Output: -20 dBm
Max-TX Output: -14 dBm
RX Sensitivity: -34 dBm

Physical Characteristics

Weight: 495 g (1.10 lb)
Dimensions: 132 x 150 x 42 mm (5.20 x 5.91 x 1.65 in)

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 158°F)

Standards and Certifications

EMC: EMC Level 4, ESD Level 4, criteria A

Software Functions

IEEE 1588 or IP Teaming Selectable (Default =IP Teaming): Supports 4 modes
AFT: Adapter Failover Teaming
SFT: Switch Fault Tolerance
ALB: Adapter Failover and Load Balancing
Link Aggregation: supported

Compatibility Chart for Peripheral Expansion Modules and Embedded Computers

All expansion modules can be used on any of Moxa's embedded computers that come with the peripheral expansion slots. Refer to the following chart.

Module Models	DA-682A	DA-710	DA-683	DA-681A
DA-SP08-DB 8-port Serial Module (RS-232/422/485)	✓	✓	✓	–
DA-SP08-I-DB 8-port Serial Module (RS-232/422/485)	✓	✓	✓	–
DA-SP08-I-TB 8-port Serial Module (RS-232/422/485)	✓	✓	✓	–
DA-SP38-I-TB 8-port Serial Module (RS-422/485)	✓	✓	✓	–
DA-LN04-RJ 4-port LAN Module (10/100 Mbps)	✓	✓	✓	–
DA-SW08-RJ 8-port Switch Module (10/100 Mbps)	✓	✓	✓	–
DA-UPCI-DK PCI Module	✓	✓	✓	–
DA-FX04-MM-ST-T 4-port Fiber LAN Module (100 Mbps)	✓	✓	✓	–
DA-SP08-I-EMC4-DB 8-port Serial Module (RS-232/422/485)	✓	✓	✓	–
DA-SP08-I-EMC4-TB 8-port Serial Module (RS-232/422/485)	✓	✓	✓	–
DA-IRIGB-4DIO-PCI104-EMC4 Time Synchronization Module	✓	✓	✓	✓

Ordering Information

Available Models

DA-IRIGB-4DIO-PCI104-EMC4: 1 IRIG-B signal input port, 3 digital inputs, 4 digital outputs
DA-SP08-I-DB: 8-port RS-232/422/485 serial module with DB9 connector and digital isolation
DA-SP08-DB: 8-port RS-232/422/485 serial module with DB9 connector
DA-SP08-I-TB: 8-port RS-232/422/485 serial module with terminal block connector and digital isolation
DA-SP38-I-TB: 8-port RS-422/485 serial module with terminal block connector and digital isolation
DA-SW08-RJ: 8-port 10/100 Mbps unmanaged switch module
DA-LN04-RJ: 4-port 10/100 Mbps LAN module
DA-UPCI-DK: Universal PCI development kit
DA-FX04-MM-ST-T: 4-port (100BaseFX) fiber LAN module with multi-mode, ST connector, supports IP Teaming
DA-SP08-I-EMC4-DB: 8-port RS-232/422/485 serial module with DB9 connector, digital isolation, and capable of withstanding EMS Level 4 environments
DA-SP08-I-EMC4-TB: 8-port RS-232/422/485 serial module with terminal block connector, digital isolation, and capable of withstanding EMS Level 4 environments

Model Name	Serial Ports		Isolation	Switch	LAN		Connector Type				PCI
	RS-232/422/485	RS-232/485	2 kV Digital	10/100 Mbps	10/100 Mbps (RJ45)	Fiber 100 Mbps (ST)	DB9	RJ45	Terminal Block	ST	3.3/5 V
DA-SP08-I-DB	8	–	✓	–	–	–	✓	–	–	–	–
DA-SP08-DB	8	–	–	–	–	–	✓	–	–	–	–
DA-SP08-I-TB	8	–	✓	–	–	–	–	–	✓	–	–
DA-SP38-I-TB	–	8	✓	–	–	–	–	–	✓	–	–
DA-SW08-RJ	–	–	–	8	–	–	–	✓	–	–	–
DA-LN04-RJ	–	–	–	–	4	–	–	✓	–	–	–
DA-UPCI-DK	–	–	–	–	–	–	–	–	–	–	✓
DA-FX04-MM-ST-T	–	–	–	–	–	✓	–	–	–	✓	–
DA-IRIGB-4DIO-PCI104-EMC4	–	–	–	–	–	–	✓	–	–	–	–
DA-SP08-I-EMC4-DB	8	–	✓	–	–	–	✓	–	–	–	–
DA-SP08-I-EMC4-TB	8	–	✓	–	–	–	–	–	✓	–	–

UC-8100 Series

Communication-centric RISC computing platform

- ARMv7 Cortex-A8 300/600/1000 MHz processor
- Dual auto-sensing 10/100 Mbps Ethernet ports
- SD socket for storage expansion and OS installation
- Rich programmable LEDs and a programmable button for easy installation and maintenance
- Mini PCIe socket for cellular module
- Debian ARM 7 open platform
- Cybersecurity

Overview

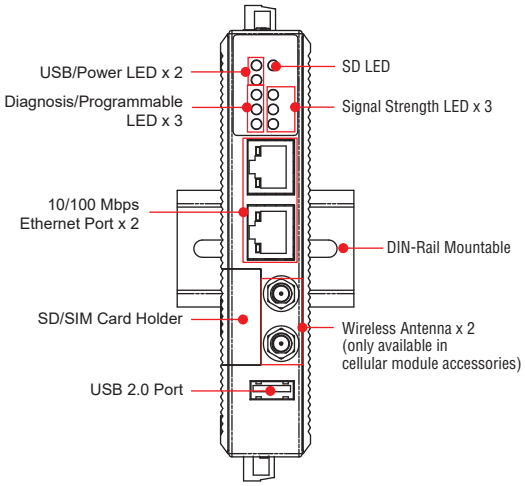
The UC-8100 computing platform is designed for embedded data acquisition applications. The computer comes with one or two RS-232/422/485 serial ports and dual 10/100 Mbps Ethernet LAN ports, as well as a Mini PCIe socket to support cellular modules. These versatile communication capabilities let users efficiently adapt the UC-8100 to a variety of complex communications solutions.

The UC-8100 is built around a Cortex-A8 RISC processor that has been optimized for use in energy monitoring systems, but is widely applicable to a variety of industrial solutions. With flexible interfacing options, this tiny embedded computer is a reliable and secure gateway for data acquisition and processing at field sites as well as a useful communication platform for many other large-scale deployments.

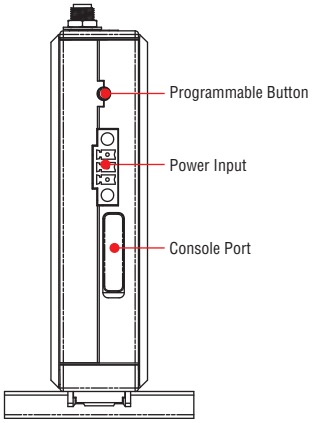
Wide temperature (T) models* are also available for extended temperature applications. All units are thoroughly tested in a testing chamber, guaranteeing that the computing platforms are suitable for wide temperature applications.

Appearance

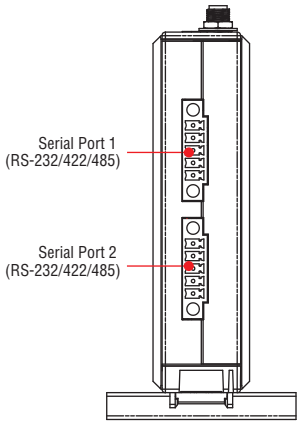
Front View



Top View

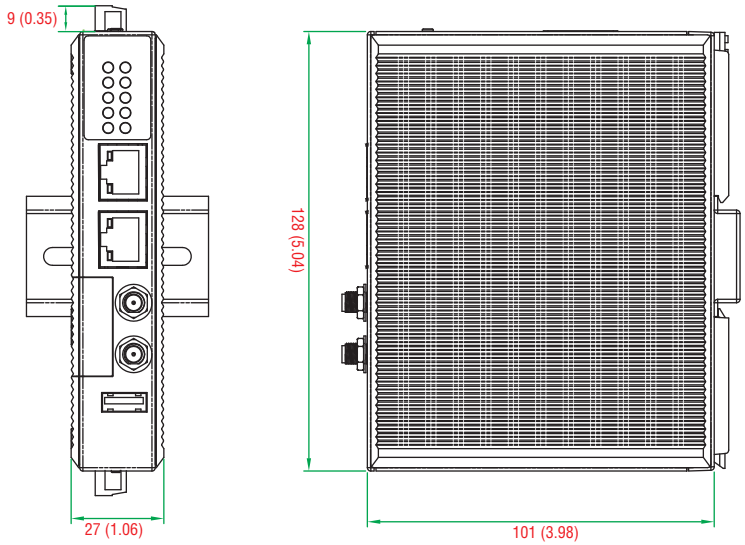


Bottom View



Dimensions

Unit: mm (inch)



Hardware Specifications

Computer

CPU: ARMv7 Cortex-A8 300/600/1000 MHz
USB: USB 2.0 hosts x 1, Type A connector
DRAM: DDR3 SDRAM:
UC-8112-LX: 512 MB
UC-8162-LX: 512 MB
UC-8132-LX: 256 MB
UC-8131-LX: 256 MB
OS (pre-installed): Debian ARM 7 (Kernel 3.2)

Storage

Storage Expansion:
• SDHC/SDXC socket for storing OS and storage expansion
• 1 GB SD card with OS pre-installed
• MicroSD socket for storage expansion (UC-8112-LX only)
• 2 GB MicroSD cards with OS pre-installed (UC-8112-LX only)

Ethernet Interface

LAN: Auto-sensing 10/100 Mbps ports (RJ45) x 2
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface

Serial Standards: RS-232/422/485 ports, software-selectable (5-pin terminal block connector) x 1 or 2
Console Port: RS-232 (TxD, RxD, GND), 4-pin pin header output (115200, n, 8, 1)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: Max. 921600 bps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

LEDs

System: Power x 1, USB x 1, SD x 1, signal strength x 3 (UC-8112/8162/8132 with cellular module)
LAN: 10M/100M on connector
Programmable: Diagnosis x 3

Switches and Buttons

Push Button: Initially configured to return a diagnostic report, and to reset the device to factory defaults

Physical Characteristics

Housing: Polycarbonate plastic
Weight: 224 g (0.50 lb)
Dimensions: 101 x 27 x 128 mm (3.98 x 1.06 x 5.04 in)
Mounting: DIN-rail, wall (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 80°C (-40 to 176°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: 2 Grms @ IEC 60068-2-64, random wave, 5-500 Hz, 1 hr per axis (without any USB devices attached)
Anti-Shock: 20 g @ IEC 60068-2-27, half sine wave, 30 ms

Power Requirements

Input Voltage: 12 to 24 VDC (3-pin terminal block, V+, V-, SG)
Input Current:
• 450 mA @ 12 VDC
• 225 mA @ 24 VDC
Power Consumption: 5.4 W (without cellular module and external USB device attached)

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A

EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8: 20 A/m
IEC 61000-4-9: 300 A/m
Green Product: RoHS, CRoHS, WEEE

Reliability

Alert Tools: Built-in RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)

Time:
UC-8162-T-LX: 301,648 hrs
UC-8132-T-LX: 302,648 hrs
UC-8131-T-LX: 315,063 hrs
UC-8112-T-LX: 1,181,598 hrs
UC-8162-LX/UC-8132-LX: 1,195,173 hrs
UC-8131-LX: 1,465,546 hrs
UC-8112-LX: 1,149,242 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Software Specifications

Linux

OS: Debian ARM 7
Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML
Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network
Kernel: GNU/Linux 3.2
System Shell: DASH (default), BASH
Text Editor: vim, nano
Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv2, ICMP, ARP, HTTP, CHAP,PAP,DHCP, NTP,NFS, SSH, PPP, SFTP, RSYNC, SSL
Programming Language Support: PHP, Perl, Python
Internet Security Suite: OpenVPN, iptables
Cryptographic Hardware Accelerators: AES, SHA, OpenSSL
Self Diagnosis: Check status of system and hardware component via software method
Linux Board Support Packages (BSP):
• GCC C/C++ cross development tool chain
• Bootloader/ Kernel/ filesystem
Cellular Networking: (UC-8132-LX, UC-8162-LX, UC-8112-LX only)
• WVDIAL: Point-to-Point Protocol dialer that dials a modem and starts pppd to connect to the Internet.
• QMI (Qualcomm MSM Interface): Glib-based library for talking to WWAN modems and devices that speak the Qualcomm MSM Interface (QMI) protocol.
• MODBUS: Software library to send/receive data according to the Modbus protocol. This library is written in C and supports RTU (serial) and TCP (Ethernet) communications.
• Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Linux standard API).
Cybersecurity:
• Secure Boot: A novel authentication algorithm proposed to secure platform integration. Only trusted Linux kernel and bootloader should be executed (Patent Pending).
• SUDO Mechanism: Sudo (sometimes considered short for Super-user Do) is a program designed to let system administrators allow some users to execute some commands as root (or another user). The basic philosophy is to give as few privileges as possible but still allow people to get their work done, and the Root account is disabled by default.
• Security Update of existing software packages: All packages in the UC-8100 could be updated for security purposes via Debian or Moxa's Advanced Packaging Tool (APT) server.
• USB Protection: Provides a mechanism for disabling USB function to avoid USB stick malware attacks.
• SD Write Protection: Provides a mechanism for disabling SD write permission both in the filesystem SD and extended storage SD. (Note: Extended storage SD is only supported by the UC-8112-LX).

Ordering Information

Model	CPU	RAM	Serial	Ethernet	Mini PCIe Socket for Wireless Module	Micro SD Socket	SD Socket
UC-8112-LX	1 Ghz	512 MB	2	2	✓	✓ (2 GB MicroSD card with OS pre-installed)	✓ (SD card not attached)
UC-8162-LX	600 Mhz	512 MB	2	2	✓	–	✓ (1 GB SD card with OS pre-installed)
UC-8132-LX	300 Mhz	256 MB	2	2	✓	–	✓ (1 GB SD card with OS pre-installed)
UC-8131-LX	300 Mhz	256 MB	1	2	–	–	✓ (1 GB SD card with OS pre-installed)

Package Checklist (computer)

- UC-8100 embedded computer
- Power jack
- 3-pin terminal block for power
- 5-pin terminal block for UART x 2

Optional Accessories

Power Adapters & Cords, Console Cable		
Adapter	PWR-24250-DT-S1	Power adapter with input: 100-240 VAC, 50-60 Hz, 1.5 A Output: 24 VDC, 2.5 A, 60 W for test and system development in the office under ambient temperature
Power Cord	PWC-C7US-2B-183	Power cord with 2-pin connector, USA plug
Power Cord	PWC-C7EU-2B-183	Power cord with 2-pin connector, Euro plug
Power Cord	PWC-C7UK-2B-183	Power cord with 2-pin connector, British plug
Power Cord	PWC-C7AU-2B-183	Power cord with 2-pin connector, Australia plug
Power Cord	PWC-C7CN-2B-183	Power cord with 2-pin connector, China plug
Console Cable	CBL-F9DPF1x4-BK-100	Console cable with 4-pin connector
Wireless Package		
Cellular Package	CELLULAR-LTE-US	LTE module mounting package: • Cellular module x 1 • i-PEX MHF to SMA adapter with cable x 1 • Mini PCI/e mounting screw sets x 2
Cellular Package	CELLULAR-LTE-EU	LTE module mounting package: • Cellular module x 1 • i-PEX MHF to SMA adapter with cable x 1 • Mini PCI/e mounting screw sets x 2
Cellular Package	CELLULAR-3G-EVDO-HSPA+	3G module mounting package: • Cellular module x 1 • i-PEX MHF to SMA adapter with cable x 1 • Mini PCI/e mounting screw sets x 2
WiFi Package	WiFi-BGN	WiFi module mounting package: • WiFi module x 1 • i-PEX MHF to RP-SMA adapter with cable x 1 • Mini PCI/e mounting screw sets x 2
Antennas and Internal Antenna Cables		
GPS Antenna	ANT-GPS-OSM-05-3M	Active GPS antenna, 26 dBi, 1572 MHz, L1 band antenna for GPS
3G Antenna	ANT-3G-SMA	SMA male antenna for cellular, support bands: 850/900/1800/1900/2100 MHz
WiFi Antenna	ANT-WDB-ARM-02	RP-SMA male antenna for WiFi, support bands: 2.4 Ghz
Cellular antenna cable	A-CRF-MHFSF	i-PEX MHF (male, on cellular module) to SMA (female, on top cover) adapter with cable. For when you need to install a GPS antenna or second cellular antenna.
WiFi antenna cable	CRF-MHF/SMA(M)-14.2	i-PEX MHF (male, on cellular module) to RP-SMA (female, on top cover) adapter with cable. For when you need to install a second WiFi antenna.
Mounting Kits		
Wall-mounting Kit	WALLMOUNT-8100-01	Wall-mounting kit with screws

Railway Computers

Product Selection Guide

Railway Computers 22-2

Onboard Computers

TC-6110 Series: EN 50155-compliant x86 train computer with dual LAN ports, dual power inputs, USB, VGA, serial port, CompactFlash, and 4 expansion slots. 22-4

TC-6000 Series Expansion Modules: Peripheral modules for the TC-6000 series 22-8

V2616A Series: x86 embedded computer with Intel Core i5/i7 processor, dual M12 Ethernet ports, serial interfaces, 6 DIs, 2 DOs, VGA and DVI-D, 3 USB ports, 3 SATA interfaces, 2 removable drive trays, CFast card 22-11

V2406A Series: x86 embedded computer with Intel Celeron/Core i7 CPU, VGA, DVI, dual M12 Ethernet ports, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, dual CFast slots 22-15

V2416A Series: x86 embedded computer with Intel Celeron/Core i7 CPU, VGA, DVI, dual M12 Ethernet ports, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, dual CFast slots, 2 hot-swappable storage trays 22-20

V2426A Series: x86 embedded computer with Intel Celeron/Core i7 CPU, VGA, DVI, dual M12 Ethernet ports, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, dual CFast slots, 2 peripheral expansion slots, 12 to 48 VDC power 22-25

V2400 Series Expansion Modules: Expansion peripheral modules (EPM) for the V2400A series 22-31

(Mobile) Multiple WAN Computers

UC-8481 Series: Industrial RISC-based mobile Linux computers with cellular, Wi-Fi, and GPS modules, 2 Ethernet, 2 serial, 2 USB 2.0 ports, and 2 mini PCIe sockets 22-35

Mobile Networking Appliances

RNAS-1200 Series: Network-attached storage with 2 M12 gigabit PoE/PoE+ LAN ports and -40 to 70°C temperature tolerance 22-40

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Railway Computers

Railway Computers

	TC-6110 Series	V2616A Series	V2406A Series	V2416A Series
Computer				
CPU	Intel Atom D525 (dual-core, 1.8 GHz)	Intel Core i5-3610ME (2.7 GHz) Intel Core i7-3517UE (1.7 GHz) Intel Core i7-3612QE (2.1 GHz)	Intel Celeron 1047UE (1.4 GHz) Intel Core i7-3517UE (1.7 GHz)	Intel Celeron 1047UE (1.4 GHz) Intel Core i7-3517UE (1.7 GHz)
OS	Windows Embedded Standard 7 or Linux Debian 7	Windows Embedded Standard 7 or Linux Debian 7	Windows Embedded Standard 7 or Linux Debian 7	Windows Embedded Standard 7 or Linux Debian 7
System Memory	2 GB pre-installed	4 GB pre-installed	4 GB pre-installed	4 GB pre-installed
USB	USB 2.0 hosts x 3 (Type A connectors x 2, supporting system boot up, M12 connectors x 1)	USB 2.0 hosts x 3 (Type A connectors x 2, supporting system boot up, M12 connectors x 1)	USB 2.0 hosts x 3 (Type A connectors x 2, supporting system boot up, M12 connectors x 1)	USB 2.0 hosts x 3 (Type A connectors x 2, supporting system boot up, M12 connectors x 1)
Storage				
Built-in	8 GB onboard industrial CompactFlash card for operating system storage	–	–	–
Expansion Slot	–	1 full-size/half-size mini PCIe socket with 1 SIM card socket. Mini PCIe socket supports power on/off control	–	–
HDD/SSD Support	2 removable TC-SATA-T storage trays for 2.5-inch SSD or HDD storage drive (with Intelligent Heating Solution)	2 hot-swappable storage trays for 2.5-inch SATA SSD or HDD, 1 internal SATA-II storage connector for 2.5-inch SSD or HDD	1 internal SATA-II bus for 2.5-inch HDD/SSD*	2 hot-swappable trays for 2.5-inch HDD/SSD storage expansion*
CFast Support	–	1 slot for OS*, 1 slot for backup storage	1 slot for OS*, 1 slot for backup storage	1 slot for OS*, 1 slot for backup storage
Display				
Graphics Controller	Integrated Intel GMA 3150 (Pineview) Graphics Engine	Intel® HD Graphics 4000 (integrated)	Intel® HD Graphics 4000 (integrated)	Intel® HD Graphics 4000 (integrated)
Connector Type	–	1 DVI-I connector, 1 VGA connector	2 DVI-I connectors	2 DVI-I connectors
Display Interface	Up to 2048 x 1536 resolution at 75 Hz, DB9 female connector	• DVI up to 1920 x 1200 resolution @ 60 Hz • VGA up to 1920 x 1200 resolution @ 60 Hz • VGA up to 2048 x 1536 resolution @ 75 Hz	• DVI up to 1920 x 1200 resolution @ 60 Hz • VGA up to 1920 x 1200 resolution @ 60 Hz • VGA up to 2048 x 1536 resolution @ 75 Hz	• DVI up to 1920 x 1200 resolution @ 60 Hz • VGA up to 1920 x 1200 resolution @ 60 Hz • VGA up to 2048 x 1536 resolution @ 75 Hz
Ethernet Interface				
LAN	Auto-sensing 10/100/1000 Mbps ports (M12) x 2	Auto-sensing 10/100/1000 Mbps ports (M12 X-coded) x 2	Auto-sensing 10/100/1000 Mbps ports (M12 X-coded) x 2	Auto-sensing 10/100/1000 Mbps ports (M12 X-coded) x 2
Serial Interface				
Serial Standards	1 RS-232 port (DB9 male)	2 software-selectable RS-232/422/485 ports (DB9 male)	4 RS-232/422/485 ports, software selectable (DB9 male)	4 software-selectable RS-232/422/485 ports (DB9 male)
ESD Protection	–	4 kV for all signals	4 kV for all signals	4 kV for all signals
Data Bits	5, 6, 7, 8	5, 6, 7, 8	5, 6, 7, 8	5, 6, 7, 8
Stop Bits	1, 1.5, 2	1, 1.5, 2	1, 1.5, 2	1, 1.5, 2
Parity	None, Even, Odd, Space, Mark	None, Even, Odd, Space, Mark	None, Even, Odd, Space, Mark	None, Even, Odd, Space, Mark
Flow Control	RTS/CTS	RTS/CTS	RTS/CTS	RTS/CTS
Isolation Protection	–	1.5 kV	1.5 kV	1.5 kV
Digital Input				
Input Channels	–	6	6	6
Input Voltage	–	0 to 30 VDC at 25 Hz	0 to 30 VDC at 25 Hz	0 to 30 VDC at 25 Hz
Digital Output				
Output Channels	–	2, sink type	2, sink type	2, sink type
Output Current	–	Max. 200 mA per channel	Max. 200 mA per channel	Max. 200 mA per channel
On-state Voltage	–	24 VDC nominal, open collector to 30 VDC	24 VDC nominal, open collector to 30 VDC	24 VDC nominal, open collector to 30 VDC
Physical Characteristics				
Housing	Aluminum and SECC sheet metal (1 mm)	Aluminum	Aluminum	Aluminum
Weight	5 kg (11.11 lb)	5 kg (11.11 lb)	2 kg (4.44 lb)	4 kg (8.98 lb)
Dimensions	With ears: 210 x 269 x 133 mm (8.27 x 10.60 x 5.24 in)	287 x 290 x 101 mm (11.29 x 11.41 x 3.97 in)	With ears: 275 x 63 x 154 mm (10.83 x 2.47 x 6.06 in)	With ears: 275 x 92 x 154 mm (10.83 x 3.62 x 6.06 in)
Mounting	Rack	Wall	DIN rail, wall, VESA	DIN rail, wall, VESA
Environmental Limits				
Operating Temperature	-25 to 55°C (-13 to 140°F) or -40 to 70°C (-40 to 158°F)	-25 to 55°C (-13 to 140°F) or -40 to 70°C (-40 to 158°F)	-25 to 55°C (-13 to 131°F) or -40 to 70°C (-40 to 158°F)	-25 to 55°C (-13 to 131°F) or -40 to 70°C (-40 to 158°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)	(with SSD installed) -40 to 85°C (-40 to 185°F)	-40 to 85°C (-40 to 185°F)	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Conformal Coating	Available	Available	Available on request	Available on request
Power Requirements				
Input Voltage	24 to 110 VDC (M12 A-coded)	24 to 110 VDC (M12 A-coded)	12 to 48 VDC (M12 A-coded)	12 to 48 VDC (M12 A-coded)
Power Consumption	32 W (without heater), 62 W (with heater)	• 60 W (no SSD/HDD attached) • 2.5 A @ 24 VDC to 0.55 A @ 110 VDC	• 3.3 A @ 12 VDC, 39.6 W • 0.82 A @ 48 VDC, 39.4 W	• 3.3 A @ 12 VDC, 39.6 W • 0.82 A @ 48 VDC, 39.4 W
Standards and Certifications				
Safety	UL 60950-1, CSA C22.2 No. 60950-1-07, EN 60950-1	UL 60950-1, CSA C22.2 No. 60950-1-07, EN 60950-1	UL 60950-1, EN 60950-1	UL 60950-1, EN 60950-1
EMC	EN 55022:2010 Class A, EN 55024:2010, FCC CFR Title 47 Part 15 Subpart B: 2011 Class A, CISPR 22:2008, ANSI C63.4:2009, ICES-003 Issue 5:2012 Class A	EN 55022 Class A, EN 61000-3-2 Class D, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A	EN 55022/24	EN 55022/24
EMI	–	–	CISPR 22, FCC Part 15B Class A	CISPR 22, FCC Part 15B Class A
EMS	IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11			
Green Product	–	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE
RF	EN 62311:Jan 2008, ETSI EN 301 489-1:V1.9.2 (2011-09), ETSI EN 301 489-3:V1.4.1 (2002-08), ETSI EN 301 893:V1.6.1 (2011-11), ETSI EN 300 328:V1.7.1 (2006-10), ETSI EN 300 440-1:V1.6.1 (2010-08), ETSI EN 300 440-2:V1.4.1 (2010-08)	–	–	–
Rail Traffic	EN 50155:2007 (essential compliance*), EN 50121-3-2:2006, EN 50121-4:2006	EN 50155 (essential compliance*), EN 50121-3-2, EN 50121-4	EN 50155*, EN 50121-3-2, EN 50121-4	EN 50155*, EN 50121-3-2, EN 50121-4
Environmental Tests	EN 60068-2-1:2007, EN 60068-2-2:2007, EN 61373:1999	EN 60068-2-1:2007, EN 60068-2-2:2007, EN 61373:1999	–	–
Warranty				
Warranty Period	3 years	3 years	3 years	3 years
Details	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty
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Railway Computers

	V2426A Series	UC-8481 Series	RNAS-1200 Series
Computer			
CPU	Intel Celeron 1047UE (1.4 GHz), Intel Core i7-3517UE (1.7 GHz)	533 MHz	1.0 GHz
OS	Windows Embedded Standard 7 or Linux Debian 7	Linux (pre-installed)	–
System Chipset	Mobile Intel® HM65 Express	–	–
System Memory	1 DDR3-1600 SO-DIMM SDRAM slot, 8 GB max., 4 GB pre-installed	–	–
USB	USB 2.0 hosts x 3 (Type A connectors x 2, M12 D-coded x 1)	USB 2.0 hosts x 2	–
DRAM	–	512 MB DDR2 SDRAM onboard, 32 MB NOR Flash, 512 MB NAND Flash	512 MB DDRII
Flash Memory	–	–	Onboard 2 GB USB DOM to store OS
Storage			
Storage Expansion	–	CompactFlash socket	–
HDD/SSD Support	1 internal SATA-II bus for 2.5-inch HDD/SSD storage expansion*	–	2.5-inch HDD bays x 2, reserved for storage expansion
CFast Support	1 slot for OS*, 1 slot for backup storage	–	–
Display			
Graphics Controller	Intel® HD Graphics 4000 (integrated)	–	–
Connector Type	2 DVI-I connectors	–	–
Display Interface	DVI up to 1920x1200 resolution @ 60 Hz VGA up to 1920x1200 resolution @ 60 Hz VGA up to 2048x1536 resolution @ 75 Hz	–	–
Ethernet Interface			
LAN	Auto-sensing 10/100/1000 Mbps ports (M12 X-coded) x 2	Auto-sensing 10/100 Mbps ports (M12) x 2	Auto-sensing 10/100/1000 Mbps ports (M12) x 2
Magnetic Isolation Protection	–	1.5 kV built in	–
Serial Signals			
RS-232	TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND	TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND	–
RS-422	TxD+, TxD-, RxD+, RxD-, GND	TxD+, TxD-, RxD+, RxD-, GND	–
RS-485-4w	TxD+, TxD-, RxD+, RxD-, GND	TxD+, TxD-, RxD+, RxD-, GND	–
RS-485-2w	Data+, Data-, GND	Data+, Data-, GND	–
Digital Input			
Input Channels	6	4	–
Input Voltage	0 to 30 VDC at 25 Hz	0 to 30 VDC	–
Digital Input Levels for Dry Contacts	• Logic level 0: Close to GND • Logic level 1: Open	• Logic level 0: Close to GND • Logic level 1: Open	–
Digital Input Levels for Wet Contacts	• Logic level 0: +3 V max. • Logic level 1: +10 V to +30 V (Source to DI)	• Logic level 0: +3 V max. • Logic level 1: +10 V to +30 V (COM to DI)	–
Digital Output			
Output Channels	2, sink type	4, sink type	–
Output Current	Max. 200 mA per channel	Max. 200 mA per channel	–
On-state Voltage	24 VDC nominal, open collector to 30 VDC	24 VDC nominal, open collector to 30 ⊗	–
Connector Type	10-pin screw-fastened Euroblock terminal (6 inputs, 2 outputs, DI Source, GND)	10-pin screw terminal block (4 points, GND)	–
Isolation	3 kV optical isolation	–	–
IHS Control			
IHS Function Control	–	–	Temperature reading, power output control for heating function
Physical Characteristics			
Housing	Aluminum	SECC sheet metal (1 mm)	Aluminum
Weight	3 kg (6.67 lb)	1 kg (2.22 lb)	1.98 kg (4.4 lb) (RNAS-1201-T)/2 kg (4.44 lb) (RNAS-1211-T)
Dimensions	With ears: 275 x 92 x 154 mm (10.83 x 3.62 x 6.06 in)	200 x 57 x 120 mm (7.87 x 2.24 x 4.72 in)	252 x 130 x 57 mm (9.92 x 5.12 x 2.24 in)
Mounting	DIN rail, wall, VESA	DIN rail, wall	wall
Environmental Limits			
Operating Temperature	-25 to 55°C (-13 to 131°F) or -40 to 70°C (-40 to 158°F)	-25 to 55°C (-13 to 131°F) or -25 to 70°C (-13 to 158°F)	-40 to 70°C (-40 to 158°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)	-25 to 75°C (-13 to 167°F) or -40 to 80°C (-40 to 176°F)	-40 to 85°C (-40 to 176°F)
Ambient Relative Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Anti-Vibration	EN 50155 standard	IEC 61373 standard	EN 50155 standard
Anti-Shock	EN 50155 standard	IEC 61373 standard	EN 50155 standard
Conformal Coating	Available on request	–	Available on request
Power Requirements			
Input Voltage	12 to 48 VDC (M12 A-coded)	24 VDC (9 to 48 V), M12 connector	PoE (IEEE 802.3af), or PoE+ (IEEE 802.3at)
Power Consumption	47 W	20 W	25.5 W
Standards and Certifications			
Safety	UL 60950-1, EN 60950-1	UL 60950-1, EN 60950-1	UL 60950-1
EMC	EN 55022/24	EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class B	EN 55022 Class A, EN 61000-3-2, EN 61000-3-3, EN 55024
EMI	CISPR 22, FCC Part 15B Class A	–	FCC Part 15 Subpart B Class A, CISPR 22:2008
EMS	IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11		
Green Product	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE
Rail Traffic	EN 50155*, EN 50121-3-2, EN 50121-4 , IEC 60571	EN 50155*, EN 50121-2-3, EN 50121-4, IEC 61373	EN 50155 (essential compliance*), EN 50121-3-2, IEC 61373
Warranty			
Warranty Period	3 years	5 years (does not apply to cellular module)	5 years (storage drive not included)
Details	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty
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TC-6110 Series

EN 50155-compliant x86 train computer with dual LAN ports, dual power inputs, USB, VGA, serial port, CompactFlash, and 4 expansion slots

- Durable, fanless design for rolling stock applications
- Modular design for easy storage and peripheral expansion
- Comes with Moxa SafeGuard™, for HDD in wide temperature and high vibration environments
- Compact rackmount 3U housing, wide 24 to 110 VDC isolated power supply
- Supports SNMP-based system configuration, control, and monitoring
- Essential compliance with EN 50155*
- Conformal coating models available

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

EN 50155

Windows Embedded Standard 7

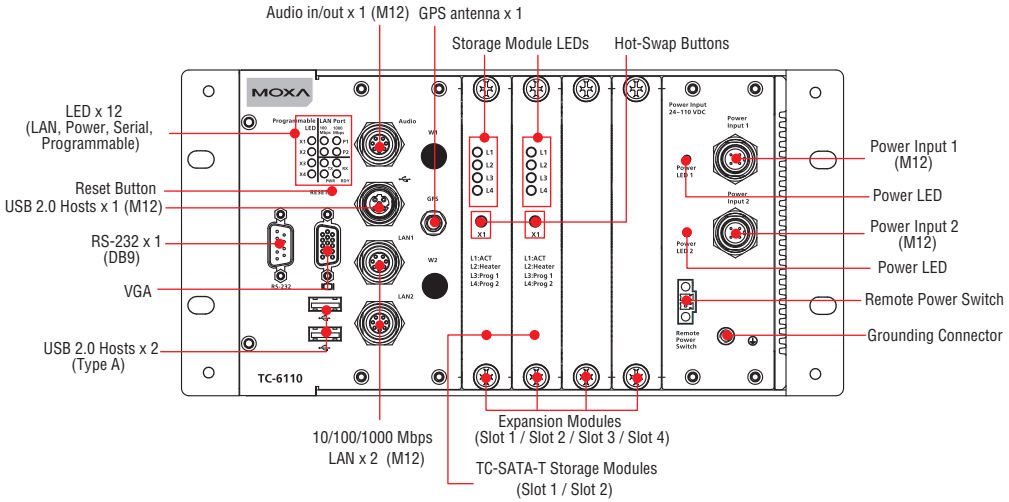
Introduction

TC-6110 train computers are designed specifically for car-borne train automation like network video recorders, passenger information systems, condition monitoring, and train-to-ground communications. The computers come with two gigabit LAN ports, one RS-232 serial port, three USB 2.0 ports, and two TC-SATA-T storage modules, giving customers a versatile solution for on-board train computing.

Designed for high reliability in the demanding conditions experienced in on-board train environments, TC-6110 computers come with M12 connectors on both the gigabit LAN ports and dual power inputs, and an additional M12 USB port. The TC-6000 Series expansion modules further allow for highly flexible, convenient integration into a variety of systems. Users can easily add storage modules for additional capacity, gigabit switch modules to expand network connectivity and/or bandwidth, serial and CAN bus modules for additional serial/CAN device connectivity, or mini PCIe modules for additional peripheral communications.

For the strongest component protection in harsh environments, TC-6110 Series computers are available with conformal coating.

Appearance



Hardware Specifications

Computer
CPU: Intel Atom D525, dual-core 64-bit threaded 1.8 GHz, 1 MB for L2 cache
OS: Windows Embedded Standard 7 or Linux
Note: The OS is pre-installed.
System Chipset: ICH8-M
System Memory: 4 GB capacity, 2 GB pre-installed: 2 slots of 2 GB DDR3-1066 204 pin SO-DIMM SDRAM
USB: USB 2.0 hosts x 3 (Type A connectors x 2, supporting system boot up, M12 connectors x 1)

Storage
Built-in: 8 GB onboard industrial CompactFlash card for operating system storage
HDD Support: 2 removable TC-SATA-T storage trays, for 2.5-inch SSD or HDD storage drive (with Intelligent Heating Solution)

Other Peripherals
Audio: 1 line in / line out interface with M12 connector
Independent Sensors: Accelerometer (G-sensor), thermometer (T-sensor)

Display
Graphics Controller: Integrated Intel GMA 3150 (Pineview) Graphics Engine
VGA Interface: Up to 2048 x 1536 resolution at 75 Hz, DB9 female connector

Ethernet Interface
LAN: Auto-sensing 10/100/1000 Mbps ports (M12) x 2

GPS Module
Receiver Types: 50 channels, GPS L1 C/A code, SBAS (WAAS), EGNOS, MSAS, GAGAN
Acquisition:
• Cold start: 29 s
• Warm start: 29 s
• Aided start: 1 s
• Hot start: 1 s
Sensitivity:
• Tracking & Navigation: -160 dBm
• Reacquisition: -160 dBm
• Cold start: -147 dBm
Accuracy:
• Autonomous: 2.5 m
• SBAS: 2.0 m
Protocols: NMEA, UBX binary, max. update rate: 5 Hz (ROM version)
Time Pulse: 0.25 Hz to 1 kHz
Velocity Accuracy: 0.1 m/s
Heading Accuracy: 0.5°
A-GPS: AssistNow Online/Offline, SUPL (Open Mobile Alliance) compliant
Operational Limits:
• Dynamics ≤ 4 g
• Altitude 50,000 m
• Velocity 500 m/s
Connector Type: QMA

WLAN Module (Available on request)
Standards: IEEE 802.11 a/b/g/n for wireless LAN
Security: WEP, TKIP, and AES hardware encryption
Antenna Type: 2 QMA connectors (female type)
Mode: Client (default), Access Point (available on request)

Serial Interface
Serial Standards: 1 RS-232 port (DB9 male)
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS
Baudrate: Up to 115.2 kbps

Serial Signals
RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

LEDs
System: Independent "Power" and "System Ready" signals
LAN: 100M/Link x 2, 1000M/Link x 2
Serial: TX x 1, RX x 1
Other: Programmable x 4

Physical Characteristics
Housing: Aluminum and SECC sheet metal (1 mm)
Weight: 5 kg (11.11 lb)
Dimensions:
• Without ears: 210 x 222 x 133 mm (8.27 x 8.74 x 5.24 in)
• With ears: 210 x 269 x 133 mm (8.27 x 10.60 x 5.24 in)
Mounting: Rack

Environmental Limits
Operating Temperature:
• Standard models: -25 to 55°C (-13 to 140°F), (EN 50155 Class T1)
• Wide temp. models: -40 to 70°C (-40 to 158°F), (EN 50155 Class Tx)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: Meets EN 50155 standard
Anti-Shock: Meets EN 50155 standard

Power
Reset Button: For warm reboot (front panel)
Input Voltage: 24 to 110 VDC, M12 connector
Power Consumption: 32 W (without heater), 62 W (with heater), no SSD/HDD attached
Note: 24 VDC and 110 VDC compliant with EN 50155

Standards and Certifications
Safety: UL 60950-1, CSA C22.2 No. 60950-1-07, EN 60950-1
EMC: EN 55022:2010 Class A, EN 55024:2010, FCC CFR Title 47 Part 15 Subpart B: 2011 Class A, CISPR 22:2008, ANSI C63.4:2009, ICES-003 Issue 5:2012 Class A
RF: EN 62311:Jan 2008, ETSI EN 301 489-1:V1.9.2 (2011-09), ETSI EN 301 489-3:V1.4.1 (2002-08), ETSI EN 301 893:V1.6.1 (2011-11), ETSI EN 300 328:V1.7.1 (2006-10), ETSI EN 300 440-1:V1.6.1 (2010-08), ETSI EN 300 440-2:V1.4.1 (2010-08)
Rail Traffic: EN 50155:2007 (essential compliance*), EN 50121-1:2006 for EMC test, EN 50121-3-2:2006, EN 50121-4:2006, EN 5011:2009+A1:2010, EN 61000-6-4:2007, CISPR 16-1-2:2003/A2:2006, CISPR 16-2-1:2003+A1:2005, CISPR 16-2-3:2006, EN 60068-2-1:2007, EN 60068-2-2:2007, EN 61373:1999
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
Environmental Tests: EN 60068-2-1:2007, EN 60068-2-2:2007, EN 61373:1999

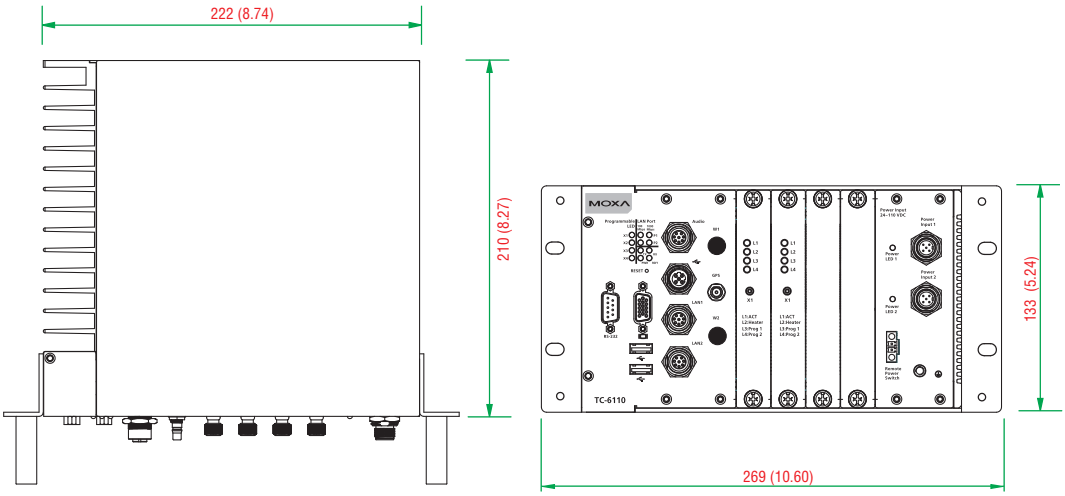
Reliability
Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting system reset with software programmable time intervals of 1-255

MTBF (mean time between failures)
Time: 360,616 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty
Warranty Period: 3 years
Details: See www.moxa.com/warranty
Note: These hardware specifications describe the embedded computer unit itself, but not its official accessories. In particular, the wide temperature specification does not apply to accessories such as power adapters and cables.

Dimensions

Unit: mm (inch)



Software Specifications

Linux

OS: Linux Debian 7
Web Server (Apache): Allows you to create and manage websites; supports PHP and XML
File System: EXT 4
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telent FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, iptables firewall
Secure Shell for Remote Access: SSH allows remote logins to a secure encrypted console from any connected network Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the Point-to-Point Protocol (PPP). Works with 'chat', 'dip', and 'dialup'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).
File Server: Enables remote clients to access files and other resources over the network
Watchdog: A watchdog timer that triggers a system reset upon software freezes, for both specific applications and system-wide failures.
Application Development Software:
• Moxa API Library
• GNU C/C++ cross-compiler
• GNU C library
• Perl
Software Package:
• SNMP
• SafeGaurd technology

Windows Embedded Standard 7

Core OS:
• Windows 7 Embedded, 32 bit
• Sensor and Location Platform
• Remote Procedure Call
Applications and Services Development:
• .Net Framework 4.0
• Remote Desktop Protocol 7.1
• COM OLE Application Support
• COM+ Application Support
• MSMQ
Internet Services:
• Internet Explorer 8.0
• IIS 7.0
Diagnostics:
• Common Diagnostic Tools
• Problem Reports and Solutions
Fonts:
• Chinese (Trad. and Simp.), Middle East, South East Asian, and South Asian Fonts
• True Type Fonts
Graphics and Multimedia:
• MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
• MPEG Layer-3 Audio Codecs(MP3)
• MPEG4 Decoders
• Windows Media Video VC-1 (WMV) Codecs
• DirectX and Windows Device Experience
• Windows Media Player 12
Management:
• Group Policy Management
• Windows Management Instrument (WMI)
• Windows Update
Networking:
• Extensible Authentication Protocol (EAP)
• Internet Authentication Service
• Telnet Server
• Bluetooth
• Domain Services
• Network Access Protection
• Network and Sharing Center
• Quality of Service
• Remote Access Service (RAS)
• Telephony API Client
• Windows Firewall
• Wireless Networking
Security:
• Credential Roaming Service
• Credentials and Certificate Management
• Windows Authorization Manager (AZMAN)
• Windows Security Center
• Active Directory Rights Management
• Security Base
• Encrypted File System (EFS)

Embedded Features:
- Enhanced Write Filter(EWF)
- File-Based Write Filter (FBWF)
- Message Box Default Reply
- Registry Filter
- WSDAPI for .NET

File Systems and Data Storage:
- Windows Data Access Components
- Windows Backup and Restore

Embedded Self-Health Diagnostics: SNMP-based remote scripting layer for monitoring, reporting, and control

Ordering Information

Available Models

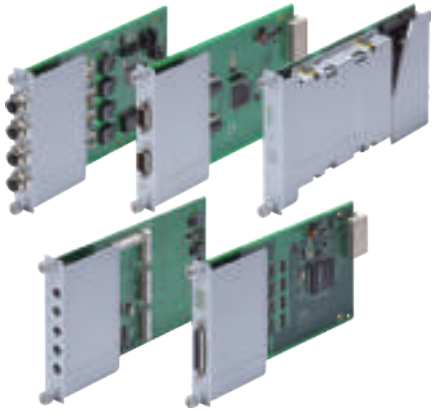
TC-6110-W7E: Modular 3U/42HP train computer, Intel Atom D525 1.8 GHz CPU, 4 expansion slots, 24 to 110 VDC isolated power, WLAN module (available on request), Win7 Embedded (32-bit), -25 to 55°C operating temperature range, compliant with EN 50155 Class T1
TC-6110-T-W7E: Modular 3U/42HP train computer, Intel Atom D525 1.8 GHz CPU, 4 expansion slots, 24 to 110 VDC isolated power, WLAN module (available on request), Win7 Embedded (32-bit), -40 to 70°C operating temperature range, compliant with EN 50155 Class TX
TC-6110-CT-W7E: Modular 3U/42HP train computer, Intel Atom D525 1.8 GHz CPU, 4 expansion slots, 24 to 110 VDC isolated power, conformal coating, WLAN module (available on request), Win7 Embedded (32-bit), -25 to 55°C operating temperature range, compliant with EN 50155 Class T1
TC-6110-CT-T-W7E: Modular 3U/42HP train computer, Intel Atom D525 1.8 GHz CPU, 4 expansion slots, 24 to 110 VDC isolated power, conformal coating, WLAN module (available on request), Win7 Embedded (32-bit), -40 to 70°C operating temperature range, compliant with EN 50155 Class TX
TC-6110-LX: Modular 3U/42HP train computer, Intel Atom D525 1.8 GHz CPU, 4 expansion slots, 24 to 110 VDC isolated power, WLAN module (available on request), Linux Debian 7, -25 to 55°C operating temperature range, compliant with EN 50155 Class T1
TC-6110-T-LX: Modular 3U/42HP train computer, Intel Atom D525 1.8 GHz CPU, 4 expansion slots, 24 to 110 VDC isolated power, WLAN module (available on request), Linux Debian 7, -40 to 70°C operating temperature range, compliant with EN 50155 Class TX
TC-6110-CT-LX: Modular 3U/42HP train computer, Intel Atom D525 1.8 GHz CPU, 4 expansion slots, 24 to 110 VDC isolated power, conformal coating, WLAN module (available on request), Linux Debian 7, -25 to 55°C operating temperature range, compliant with EN 50155 Class T1
TC-6110-CT-T-LX: Modular 3U/42HP train computer, Intel Atom D525 1.8 GHz CPU, 4 expansion slots, 24 to 110 VDC isolated power, conformal coating, WLAN module (available on request), Linux Debian 7, -40 to 70°C operating temperature range, compliant with EN 50155 Class TX

Package Checklist

- TC-6110 train computer
- Rackmount kit
- Power switch with cable extender
- M12 connector (M12A-5P-IP68)
- Power cable (CBL-Power Jack to M12)
- Quick installation guide (printed)
- Documentation and software CD or DVD
- Warranty card

TC-6000 Series Expansion Modules

Peripheral modules for the TC-6000 series



- TC-SP04-DB44-T: 4-port software-selectable RS- 232/422/485 over DB44-F serial module
- TC-CP02-DB-T: 2-port optically isolated CAN module
- TC-DK10-T/TC-DK20-T: 4-socket mini PCIe card carrier module
- TC-SW04-M12-4P-T: 4-port megabit Ethernet switch port module with M12 connector
- TC-SW04-M12-8P-T: 4-port gigabit Ethernet switch port module with M12 connector

Introduction

TC-6000 series expansion modules provide peripheral interfaces for the TC-6000 series line of railway computers.

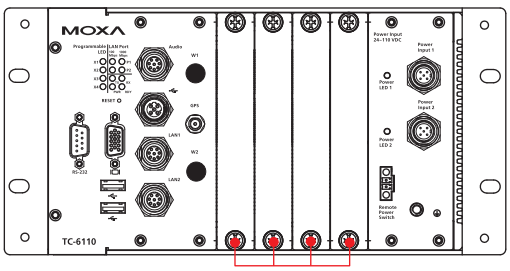
These modules include a 4-port (without PoE) gigabit or megabit Ethernet switch module with M12 connectors, a mini PCIe card carrier module with four sockets, a serial module supporting four software-selectable RS-232/422/485 interfaces over a single DB44-F connector (cable adapter), and an optically isolated CAN module with two ports.

The modules let system integrators and administrators easily add additional Ethernet ports and/or bandwidth, as well as serial, PCIe, and CAN interfaces to the TC-6000 series of train computers.

All of the TC-6000 modules are compliant with the essential sections of the EN 50155 Class TX standard, maintaining the TC-6000 series goal of offering a highly dependable computing platform suitable for a wide variety of on-board railway applications.

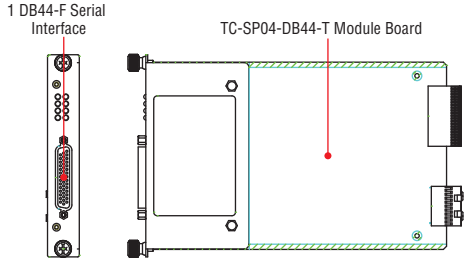
Appearance

TC-6110 Expansion Slot Location

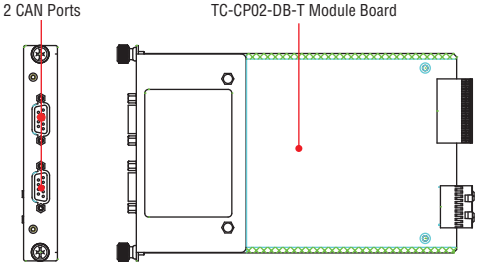


Expansion Modules
(Slot 1 / Slot 2 / Slot 3 / Slot 4)

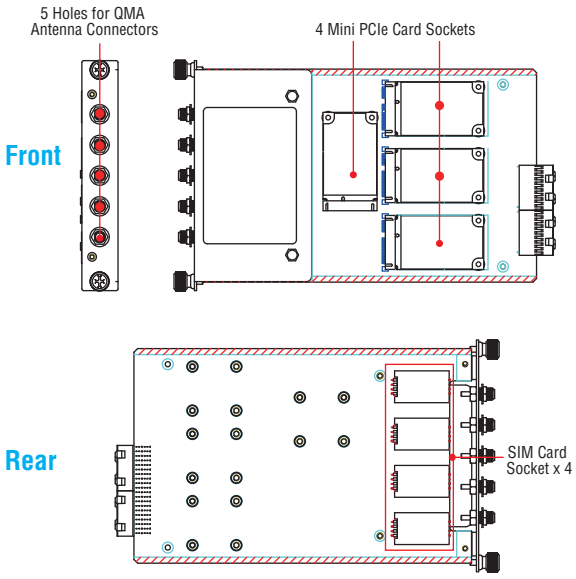
TC-SP04-DB44-T



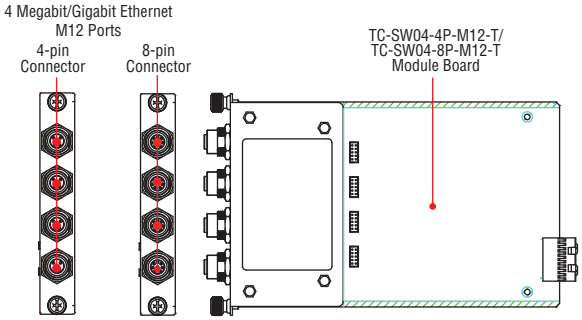
TC-CP02-DB-T



TC-DK10-T/TC-DK20-T



TC-SW04-M12-4P-T/TC-SW04-M12-8P-T



TC-SP04-DB44-T Serial Module

Serial Port Interface

Serial Standards:
RS-232/422/485, software-selectable
Connector Type:
1 DB44 connector serving all 4 interfaces; special cable required

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)

Physical Characteristics

Dimensions: 186 x 118 x 20 mm (7.32 x 4.65 x 0.79 in)
Weight: 234 g (0.52 lb)

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 158°F) (EN 50155 Class TX)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

TC-CP02-DB-T CAN Module

CAN Interface

Interface: 2 optically isolated CAN 2.0 A/B ports
Signal: CAN_H, CAN_L
Isolation: 2 kV
Speed: 1 Mbps
Connector Type: DB9 male

Physical Characteristics

Dimensions: 186 x 118 x 20 mm (7.32 x 4.65 x 0.79 in)
Weight: 227 g (0.50 lb)

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 158°F) (EN 50155 Class TX)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

TC-DK10-T/TC-DK20-T mini PCIe Carrier Module

Mini PCIe Card

Interface: 4 sockets, total
- Socket 1 on both TC-DK10-T and TC-DK20-T: USB 2.0 / PCIe V1.0
- Sockets 2, 3, and 4 on the TC-DK10-T: USB 2.0
- Sockets 2, 3, and 4 on the TC-DK20-T: USB 2.0 / PCIe V1.0

SIM Card Socket: 4 sockets reserved for cellular applications
Wireless Antenna Hole: 5 reserved for QMA antenna connectors

Physical Characteristics

Dimensions: 186 x 118 x 20 mm (7.32 x 4.65 x 0.79 in)
Weight: 220 g (0.49 lb)

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 158°F) (EN 50155 Class TX)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Model	TC-DK10-T				TC-DK20-T			
Interface	Socket 1	Socket 2	Socket 3	Socket 4	Socket 1	Socket 2	Socket 3	Socket 4
PCIe V1.0 (one lane)	✓	–	–	–	✓	✓	✓	✓
USB .20	✓	✓	✓	✓	✓	✓	✓	✓

TC-SW04-M12-4P-T/TC-SW04-M12-8P-T Switch Module

Ethernet Interface

Standard:
4 Ethernet M12 switch ports: auto-sensing 10/100 Mbps (TC-SW04-M12-4P-T) or 10/100/1000 Mbps (TC-SW04-M12-8P-T)
Protection: 1.5 kV magnetic isolation protection
Connector Type: 4-pin M12 D-coded/8-pin M12 A-coded

Physical Characteristics

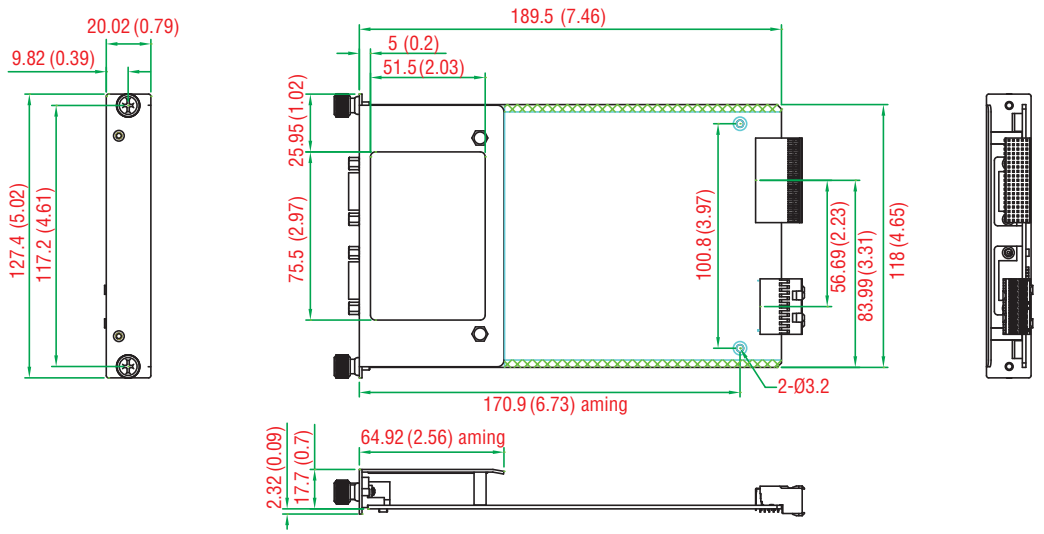
Dimensions: 186 x 118 x 20 mm (7.32 x 4.65 x 0.79 in)
Weight: 278 g (0.62 lb)

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 158°F) (EN 50155 Class TX)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

TC-SP04-DB44-T: 4 RS-232/422/485 serial interfaces over a single DB44 connector; cable sold separately, -40 to 70°C operating temperature (EN 50155 Class TX)
TC-CP02-DB-T: 2 optically isolated CAN interfaces with DB9 connectors, -40 to 70°C operating temperature (EN 50155 Class TX)
TC-DK10-T: 4 PCIe mini card slots with PCIe and USB interfaces on slot 1 and USB interfaces on Slot 2, 3 and 4, 4 SIM card sockets, -40 to 70°C operating temperature (EN 50155 Class TX)
TC-DK20-T: 4 PCIe mini card slots with PCIe and USB interfaces, 4 SIM card sockets, -40 to 70°C operating temperature (EN 50155 Class TX)
TC-SW04-M12-4P-T: 4-port megabit Ethernet switch with M12 D-coded connectors, -40 to 70°C operating temperature (EN 50155 Class TX)
TC-SW04-M12-8P-T: 4-port gigabit Ethernet switch with M12 A-coded connectors, -40 to 70°C operating temperature (EN 50155 Class TX)

Package Checklist

- TC-6000 series expansion module

V2616A Series

High performance network video recorder computer

- Compliant with EN 50121-4
- Essential compliance with EN 50155*
- IEC 61373 certified for shock and vibration resistance
- Two hot-swappable storage trays for 2.5-inch SSDs or HDDs
- SynMap for system health monitoring
- 24 to 110 VDC wide range isolated power input
- Easy coin battery replacement
- Smart Recovery for manual or automatic system recovery

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

EN 50155

Windows Embedded Standard 7

Introduction

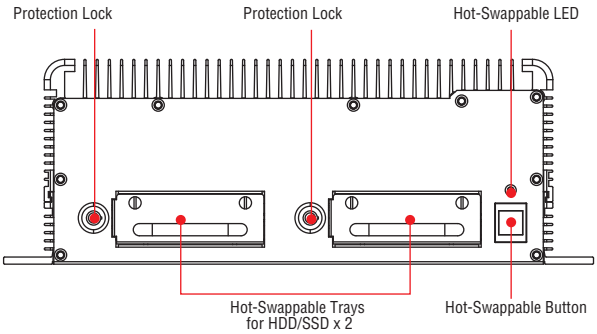
The V2616A series of embedded computers are based on the Intel Core i5/i7 processor, and feature 2 RS-232/422/485 serial ports, dual gigabit LAN ports, 3 USB 2.0 ports, and dual VGA/DVI-D video outputs. The V2616A computers are compliant with essential sections of EN 50155, covering operating temperature, power input voltage, surge, ESD, and vibration, as well as conformal coating and power insulation, making them suitable for a variety of industrial applications.

The V2616A computers come with a CFast socket that provides ample and secure data buffering or additional storage expansion, as well as 2 hot-swappable storage trays that accept 2.5-inch solid state or hard disk storage drives, and may be arranged in RAID 1 arrays to give full data redundancy.

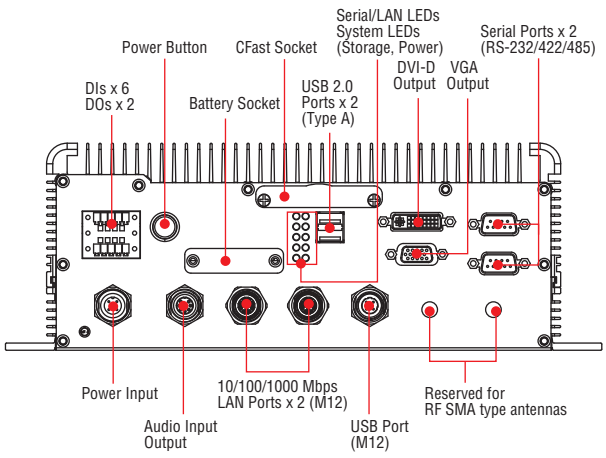
The V2616A series comes with pre-installed Windows Embedded Standard 7 or Debian 7 environments, allowing programmers and system integrators to choose their preferred computing and development platform.

Appearance

Front View



Rear View



Hardware Specifications

Computer

CPU:
• Intel® Core™ i5-3610ME dual-core processor (3M Cache, 2.7 GHz) for V2616A-C5 series
• Intel® Core™ i7-3517UE dual-core processor (4M Cache, 1.7 GHz) for V2616A-C7-T series
• Intel® Core™ i7-3612QE quad-core processor (6M Cache, 2.1 GHz) for V2616A-C8 series
OS: Linux or Windows Embedded Standard 7
Note: The OS is pre-installed.
System Chipset: Mobile Intel HM65 Express Chipset
System Memory: 16 GB capacity, 4 GB pre-installed: 2 slot of 8 GB DDR3-1600 SO-DIMM SDRAM
USB: USB 2.0 hosts x 3 (Type A connectors x 2, supporting system boot up, M12 connectors x 1)

Storage

Built-in: 8 GB CFast to store OS
Storage Expansion: 2 hot-swappable storage trays for 2.5-inch SATA SSD or HDD
HDD Support: 1 internal SATA-II storage connector for 2.5-inch SSD or HDD
Expansion Slot:
1 full-size/half-size mini PCIe socket with 1 SIM card socket. Mini PCIe socket supports power on/off control

Other Peripherals

Audio: Line-in, line-out (M12)

Display

Graphics Controller: Intel® HD Graphics 4000 (integrated)
DVI Interface: DVI-D connector (Chrontel CH7307 SDVO to DVI transmitter), max. resolution 1920 x 1200
VGA Interface: DB15 female connector, max. resolution 2048 x 1536

Ethernet Interface

LAN: Auto-sensing 10/100/1000 Mbps ports (M12 X-coded) x 2

Serial Interface

Serial Standards: 2 software-selectable RS-232/422/485 ports (DB9 male)
ESD Protection: 4 kV for all signals
Isolation Protection: 1.5 kV

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxDA(-), TxDB(+), RxDB(+), RxDA(-), GND
RS-485-4w: TxDA(-), TxDB(+), RxDB(+), RxDA(-), GND
RS-485-2w: DataA(-), DataB(+), GND

Digital Input

Input Channels: 6
Input Voltage: 0 to 30 VDC at 25 Hz
Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open
Digital Input Levels for Wet Contacts:
• Logic level 0: +3 V max.
• Logic level 1: +10 V to +30 V (Source to DI)
Isolation Protection: 3 kV

Digital Output

Output Channels: 2, sink type
Output Current: Max. 200 mA per channel
On-State Voltage: 24 VDC nominal, open collector to 30 VDC
Connector Type: 10-pin screw terminal block (6 DI points, 2 DO points, DI Source, GND)
Isolation: 3 kV optical isolation

LEDs

System: 1 Power, 1 Storage
LAN: 2 100M/Link, 2 1000M/Link
Serial: 2 TX, 2 RX

Physical Characteristics

Housing: Aluminum
Weight: 5 kg (11.11 lb)
Dimensions: 287 x 290 x 101 mm (11.29 x 11.41 x 3.97 in)
Mounting: Wall (mounting kit must be purchased separately)

Environmental Limits

Operating Temperature: (without HDD installed)
Standard models: -25 to 55°C (-13 to 131°F)
Wide temp. models: -40 to 70°C (-40 to 158°F)
Storage Temperature: (with SSD installed) -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: EN 50155 standard
Anti-Shock: EN 50155 standard

Power Requirements

Input Voltage: 24 to 110 VDC, M12 connector
Note: 24 and 110 VDC are EN 50155 compliant
Input Current: 2.5 A @ 24 VDC to 0.55 A @ 110 VDC (SSD/HDD not attached)
Power Consumption: 60 W (no SSD/HDD attached)
Power Button: On/off (rear panel)

Standards and Certifications

Safety: UL 60950-1, CSA C22.2 No. 60950-1-07, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Green Product: RoHS, CRoHS, WEEE
Rail Traffic: EN 50155 (essential compliance*), EN 50121-3-2, EN 50121-4, IEC 61373
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 second system reset, software programmable

MTBF (mean time between failures)

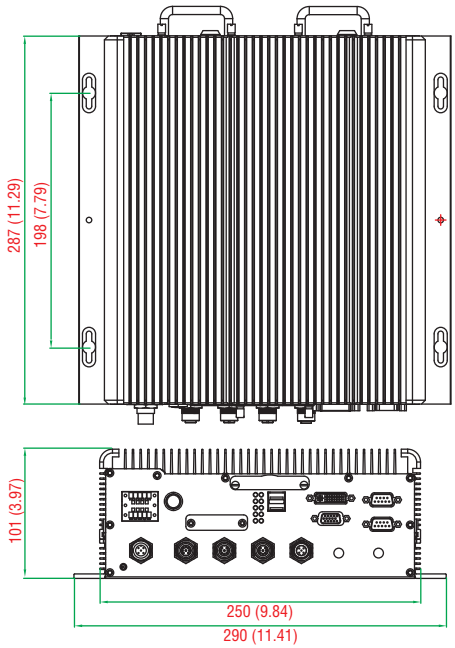
Time:
V2616A-C5 Series: 280,726 hrs
V2616A-C7/C8 Series: 261,297 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

Warranty Period: 3 years
Details: See www.moxa.com/warranty
Note: These hardware specifications describe the embedded computer unit itself, but not its official accessories. In particular, the wide temperature specification does not apply to accessories such as power adapters and cables.

Dimensions

Unit: mm (inch)



Software Specifications

Linux

OS: Linux Debian 7
Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML
Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network
File System: EXT 4
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, Netfilter/iptables
Secure Shell for Remote Access: SSH allows remote logins to a secure encrypted console from any connected network
ntpdate: Sets the date and time via NTP
Ethernet bonding: The Ethernet bonding for combination of network interfaces on one host for redundancy and/or increased throughput
Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the Point-to-Point Protocol (PPP). Works with 'chat', 'dip', and 'dialup', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).
mdadm: A Linux utility used to manage software RAID devices
Dmraid: Discovers software RAID devices and activates RAID sets
File Server: Enables remote clients to access files and other resources over the network
alsa-utils: Contains various utilities for controlling audio cards
Watchdog: A watchdog timer that triggers a system reset upon software freezes, for both specific applications and system-wide failures.
Moxa mini-PCIe Reset Utility: Resets the mini-PCIE module on the mini-PCIE slot
Moxa Hotplug Daemon: Monitors and manages the hard disk status

Application Development Software:
- Moxa API library
- GNU C/C++ cross compiler
- GNU C library
- Perl

Software Package:
- SNMP
- mx-e1000e
- mx-ptpd2

Windows Embedded Standard 7

Core OS:
- Windows 7 Embedded, 32 bit
- Remote Client
- Remote Procedure Call

Applications and Services Development:
- .Net Framework 3.5
- Remote Desktop Protocol 7.1
- COM OLE Application Support
- COM+ Application Support
- MSMQ

Internet Services:
- Internet Explorer 8.0
- IIS 7.0

File Systems and Data Storage:
- Windows Data Access Components
- Windows Backup and Restore

Diagnostics:
- Common Diagnostic Tools
- Problem Reports and Solutions

Fonts:
- Chinese (Trad. and Simp.), Japanese, Korean, Western, Middle East, South East Asian, and South Asian Fonts

Graphics and Multimedia:
- MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
- MPEG Layer-3 Audio Codecs(MP3)
- MPEG4 Decoders
- Windows Media Video VC-1 (WMV) Codecs
- DirectX and Windows Device Experience
- Windows Media Player 12

International:
- IME Simplified Chinese Support
- IME Traditional Chinese Support
- IME Japanese Support
- IME Korean Support

Management:
- Group Policy Management
- Windows Management Instrument (WMI)
- Windows Update

Networking:
- Extensible Authentication Protocol (EAP)
- Internet Authentication Service
- Telnet Server
- Bluetooth
- Domain Services
- Network Access Protection
- Network and Sharing Center
- Quality of Service
- Remote Access Service (RAS)
- Telephony API Client
- Windows Firewall
- Wireless Networking

Security:
- Credential Roaming Service
- Credentials and Certificate Management
- Windows Authorization Manager (AZMAN)
- Windows Security Center
- Active Directory Rights Management
- Security Base
- Encrypted File System (EFS)

Embedded Features:
- Enhanced Write Filter (EWF)
- File-Based Write Filter (FBWF)
- Message Box Default Reply
- Registry Filter
- WSDAPI for .NET

File Systems and Data Store:
- Windows Data Access
- Windows Backup and Restore

Embedded Self-Health Diagnostics: SNMP-based remote scripting layer for monitoring, reporting, and control

Ordering Information

Available Models

V2616A-C5: (Barebone) x86 embedded computer with Intel Core i5-3610ME, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, -25 to 55°C operating temperature (EN 50155 Class T1)
V2616A-C5-W7E: x86 embedded computer with Intel Core i5-3610ME, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 Ports, 24 to 110 VDC Power, Win7 Embedded, -25 to 55°C operating temperature (EN 50155 Class T1)
V2616A-C5-CT-W7E: x86 embedded computer with Intel Core i5-3610ME, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, Windows Embedded Standard 7, -25 to 55°C operating temperature (EN 50155 Class T1), conformal coating
V2616A-C5-LX: x86 embedded computer with Intel Core i5-3610ME, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, Linux, -25 to 55°C operating temperature (EN 50155 Class T1)
V2616A-C5-CT-LX: x86 embedded computer with Intel Core i5-3610ME, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, Linux, -25 to 55°C operating temperature (EN 50155 Class T1), conformal coating
V2616A-C7-T: (Barebone) x86 embedded computer with Intel Core i7-3517UE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, -40 to 70°C operating temperature (EN 50155 Class TX)
V2616A-C7-T-W7E: x86 embedded computer with Intel Core i7-3517UE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC Power, Windows Embedded Standard 7, -40 to 70°C operating temperature (EN 50155 Class TX)
V2616A-C7-CT-T-W7E: x86 embedded computer with Intel Core i7-3517UE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC Power, Windows Embedded Standard 7, -40 to 70°C operating temperature (EN 50155 Class TX), conformal coating
V2616A-C7-T-LX: x86 embedded computer with Intel Core i7-3517UE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, Linux, -40 to 70°C operating temperature (EN 50155 Class TX)
V2616A-C7-CT-T-LX: x86 embedded computer with Intel Core i7-3517UE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, Linux, -40 to 70°C operating temperature (EN 50155 Class TX), conformal coating
V2616A-C8: (Barebone) x86 embedded computer with Intel Core i7-3612QE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, -25 to 55°C operating temperature (EN 50155 Class T1)
V2616A-C8-W7E: x86 embedded computer with Intel Core i7-3612QE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, Windows Embedded Standard 7, -25 to 55°C operating temperature (EN 50155 Class T1)
V2616A-C8-CT-W7E: x86 embedded computer with Intel Core i7-3612QE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, Windows Embedded Standard 7, -25 to 55°C operating temperature (EN 50155 Class T1), conformal coating
V2616A-C8-LX: x86 embedded computer with Intel Core i7-3612QE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, Linux, -25 to 55°C operating temperature (EN 50155 Class T1)
V2616A-C8-CT-LX: x86 embedded computer with Intel Core i7-3612QE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, Linux, -25 to 55°C operating temperature (EN 50155 Class T1), conformal coating

Package Checklist

- V2616A embedded computer
- 2 storage tray keys
- Power cable (CBL-M12FF5PPJ21-BK-15-IP68)
- 2 5-pin terminal blocks
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

V2406A Series

Compact, fanless, anti-vibration railway computers

- Intel Celeron/Core i7 processor suitable for diverse computing demands
- Dual independent DVI-I displays
- 2 gigabit Ethernet ports with M12 X-coded connectors
- 1 SATA connector and 2 CFast sockets for storage expansion
- M12 A-coded power connector
- Compliant with EN 50121-4
- Complies with a portion of EN 50155 specifications
- Ready-to-run Windows Embedded Standard 7 or Linux Debian 7
- -40 to 70°C wide temperature models available
- Supports SNMP-based system configuration, control, and monitoring (Windows Embedded Standard 7 only)

EN 50121

Microsoft® Windows® Embedded

RoHS

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Overview

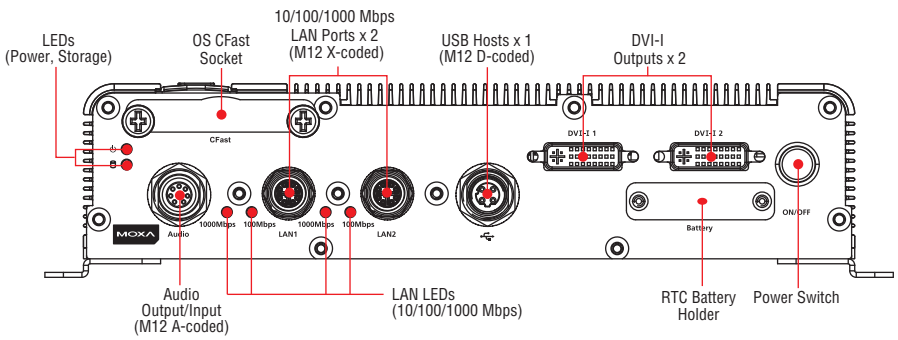
The V2406A Series embedded computers are based on the Intel 3rd generation processor, and feature 4 RS-232/422/485 serial ports, dual LAN ports, audio in/out, 3 USB 2.0 hosts, 2 CFast sockets, and 1 SATA storage socket. The V2406A computers provide dual DVI-I outputs, and in addition are compliant with a portion of EN 50155 specifications, covering operating temperature, power input voltage, surge, ESD, and vibration, making the computers suitable for a variety of industrial applications.

The dual megabit/gigabit Ethernet ports with M12 X-coded connectors offer a reliable solution for network redundancy, promising continuous operation for data communication and management. As an added convenience, the V2406A computers have 6 DIs and 2 DOs for connecting digital input/output devices, and the CFast feature provides the reliability needed for industrial applications that require data buffering and storage expansion.

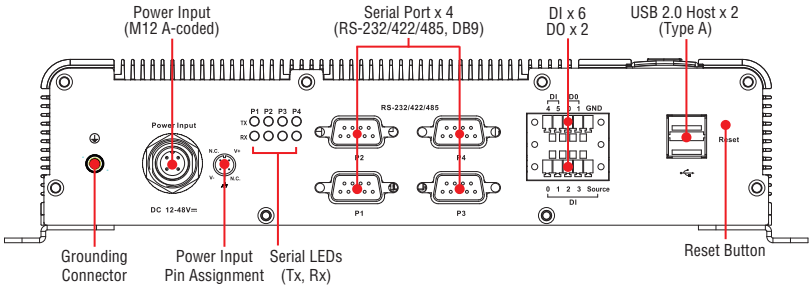
Pre-installed with Linux Debian 7 or Windows Embedded Standard 7, the V2406A Series provides programmers with a friendly environment for developing sophisticated, bug-free application software at a low cost. Wide temperature models of the V2406A Series that operate reliably in a -40 to 70°C operating temperature range are also available, offering an optimal solution for applications subjected to harsh environments.

Appearance

Front View



Rear View



Hardware Specifications

Computer

CPU:
• Intel Celeron 1047UE processor (2M cache, 1.40 GHz) for the V2406A-C2 series
• Intel Core i7-3517UE processor (6M cache, 1.7 GHz) for the V2406A-C7 series
OS: Windows Embedded Standard 7 or Linux Debian 7
System Chipset: Mobile Intel® HM65 Express
System Memory: 1 DDR3-1600 SO-DIMM SDRAM slot, 8 GB max., 4 GB pre-installed
USB: USB 2.0 hosts x 3 (Type A connectors x 2, supporting system boot up, M12 connectors x 1)

Storage

HDD/SSD Support: 1 internal SATA-II bus for 2.5-inch HDD/SSD*
*Storage drive not included. To be purchased separately.
CFast Support: 1 slot for OS*, 1 slot for backup storage
*32-bit W7E requires at least an 8 GB CFast card
*64-bit W7E requires at least a 16 GB CFast card (optional)
*Linux Debian 7 requires at least an 8 GB CFast card (to be purchased separately)

Other Peripherals

Audio: Line-in, line-out interface (M12 A-coded)

Display

Graphics Controller: Intel® HD Graphics 4000 (integrated)
Connector Type: 2 DVI-I connectors
Display Interface:
DVI up to 1920x1200 resolution @ 60 Hz
VGA up to 1920x1200 resolution @ 60 Hz
VGA up to 2048x1536 resolution @ 75 Hz

Ethernet Interface

LAN: Auto-sensing 10/100/1000 Mbps ports (M12 X-coded) x 2
Isolation Protection: 1.5 kV

Serial Interface

Serial Standards: 4 RS-232/422/485 ports, software selectable (DB9 male)
ESD Protection: 4 kV for all signals
Isolation Protection: 1.5 kV

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 kbps (non-standard baudrates supported; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Digital Input

Input Channels: 6
Input Voltage: 0 to 30 VDC at 25 Hz
Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open
Digital Input Levels for Wet Contacts:
• Logic level 0: +3 V max.
• Logic level 1: +10 V to +30 V (Source to DI)
Isolation: 3 kV optical isolation

Digital Output

Output Channels: 2, sink type
Output Current: Max. 200 mA per channel
On-State Voltage: 24 VDC nominal, open collector to 30 VDC
Connector Type: 10-pin screw-fastened Euroblock terminal (6 inputs, 2 outputs, DI Source, GND)
Isolation: 3 kV optical isolation

LEDs

System: Power, Storage
LAN: 2 per port (10/100/1000 Mbps)
Serial: 2 per port (Tx and Rx)

Switches and Buttons

Power Switch: on/off (front panel)
Reset Button: For warm reboot (front panel)

Physical Characteristics

Housing: Aluminum
Weight: 2 kg (4.44 lb)
Dimensions:
Without ears: 250 x 57 x 154 mm (9.84 x 2.23 x 6.06 in)
With ears: 275 x 63 x 154 mm (10.83 x 2.47 x 6.06 in)
Mounting: Wall, DIN rail (optional), VESA (optional)

Environmental Limits

Operating Temperature*:
Standard models: -25 to 55°C (-13 to 131°F)
Wide temp. models: -40 to 70°C (-40 to 158°F)
Storage Temperature*: -40 to 85°C (-40 to 185°F)
*without HDD installed
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: EN 50155 standard
Anti-Shock: EN 50155 standard
Conformal Coating: Available on request

Power Requirements

Input Voltage: 12 to 48 VDC (M12 A-coded)
Note: Compliant with EN 50155 at 24 VDC
Input Current:
• 3.3 A @ 12 VDC
• 0.82 A @ 48 VDC
Power Consumption: 40 W

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Green Product: RoHS, CRoHS, WEEE
Rail Traffic: EN 50155*, EN 50121-3-2, EN 50121-4 , IEC 60571
*Complies with a portion of EN 50155 specifications. Please contact Moxa or a Moxa distributor for details.

Reliability

Automatic Reboot Trigger: Software-programmable watchdog timer configurable from 1 to 255 seconds

MTBF (mean time between failures)

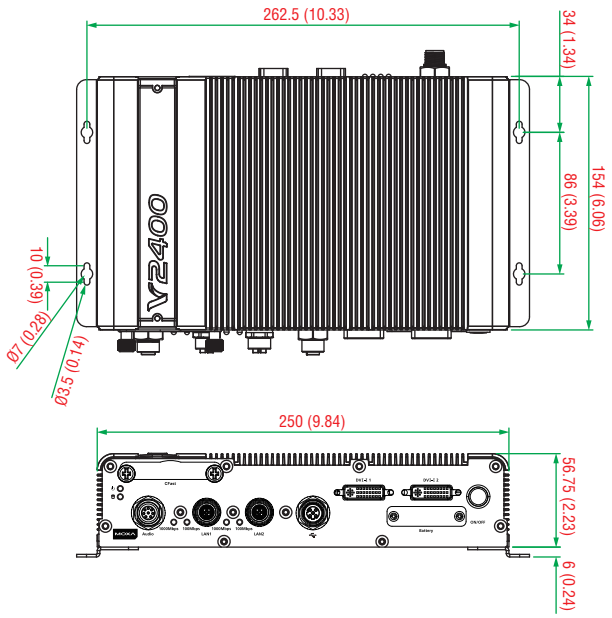
Time:
V2406A-C2 Series: 373,248 hrs
V2406A-C7 Series: 332,173 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

Warranty Period: 3 years
Details: See www.moxa.com/warranty
Note: These hardware specifications describe the embedded computer unit itself, but not its official accessories. In particular, the wide temperature specification does not apply to accessories such as power adapters and cables.

Dimensions

Unit: mm (inch)



Software Specifications

Linux

OS: Linux Debian 7
Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML
Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network
File System: EXT 4
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, iptables firewall
Secure Shell for Remote Access: SSH allows remote logins to a secure encrypted console from any connected network
Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the Point-to-Point Protocol (PPP). Works with 'chat', 'dip', and 'dialu dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).
File Server: Enables remote clients to access files and other resources over the network
Watchdog: A watchdog timer that triggers a system reset upon software freezes, for both specific applications and system-wide failures.

Application Development Software:
- Moxa API Library
- GNU C library
- Perl

Windows Embedded Standard 7

Core OS:
- 32/64-bit support
- Remote Client
- Remote Procedure Call

Applications and Services Development:
- .Net Framework 4.5
- Remote Desktop Protocol 7.1
- COM OLE Application Support
- COM+ Application Support
- MSMQ

Internet Services:
- Internet Explorer 8.0
- IIS 7.0

Diagnostics:
- Common Diagnostic Tools
- Problem Reports and Solutions

Fonts: Chinese (Trad. and Simp.), Japanese, Korean, Western, Middle Eastern, South East Asian, and South Asian Fonts

Graphics and Multimedia:
- MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
- MPEG Layer-3 Audio Codecs (MP3)
- MPEG4 Decoders
- Windows Media Video VC-1 (WMV) Codecs
- DirectX and Windows Device Experience
- Windows Media Player 12

Management:
- Group Policy Management
- Windows Management Instrument (WMI)
- Windows Update

Networking:
- Extensible Authentication Protocol (EAP)
- Internet Authentication Service
- Telnet Server
- Bluetooth
- Domain Services
- Network Access Protection
- Network and Sharing Center
- Quality of Service
- Remote Access Service (RAS)
- Telephony API Client
- Windows Firewall
- Wireless Networking

Security:
- Credential Roaming Service
- Credentials and Certificate Management
- Windows Authorization Manager (AZMAN)
- Windows Security Center
- Active Directory Rights Management
- Security Base
- Encrypted File System (EFS)

Embedded Features:
- Enhanced Write Filter (EWF)
- File-Based Write Filter (FBWF)
- Message Box Default Reply
- Registry Filter
- WSDAPI for .NET

File Systems and Data Store:
- Windows Data Access Components
- Windows Backup and Restore

Embedded Self-Health Diagnostic Software: SNMP-based remote scripting layer for monitoring, reporting, and control

SmartRecovery: BIOS level system recovery tool

Ordering Information

Type	CTO Models						Pre-Configured Models		
Model	V2406A-C2	V2406A-C2-T	V2406A-C2-CT-T	V2406A-C7	V2406A-C7-T	V2406A-C7-CT-T	V2406A-C2-W7E	V2406A-C2-T-W7E	V2406A-C7-T-W7E
Computer									
CPU	Intel Celeron 1047UE 1.4 GHz			Intel Core i7-3517UE 1.7 GHz			Intel Celeron 1047UE 1.4 GHz		Intel Core i7-3517UE 1.7 GHz
Operating System (CTO*)	Optional Note: Windows Embedded Standard 7 (32-bit/64-bit) or Linux Debian 7 (64-bit)						Windows Embedded Standard 7 (32-bit)		
Memory (CTO*)	4 GB pre-installed, can be upgradabled to 8 GB						4 GB pre-installed		
USB	USB 2.0 (Type A) x 2 USB 2.0 (M12 D-coded) x 1								
Power Input Voltage	12 to 48 VDC (M12 A-coded)								
Storage									
OS CFast Storage (CTO*)	Optional Note: 32-bit W7E requires at least an 8 GB CFast card, 64-bit W7E requires at least a 16 GB CFast card, and 64-bit Debian7 requires at least an 8 GB CFast card						8 GB CFast card pre-installed		
Backup CFast Storage (CTO*)	Optional								
SSD / HDD Storage (CTO*)	Optional Note: Anti-vibration storage kit (FK-75125-02) must be purchased separately to install an SSD/HDD								
Interface									
Display Interface	DVI-I x 2								
Audio Interface	Line in/out (M12 A-coded) x 1								
Ethernet Interface	10/100/1000 Mbps (M12 X-coded) x 2								
Serial Ports	RS-232/422/485 (DB9) x 4								
Digital Input Channels	6								
Digital Output Channels	2								
Environmental Limits									
Operating Temperature	T1: -25 to 55°C	TX: -40 to 70°C		T1: -25 to 55°C	TX: -40 to 70°C		T1: -25 to 55°C	TX: -40 to 70°C	
Conformal Coating	–		Yes	–		Yes	–		

*CTO = Configure To Order

Note:

Please refer to the Component Compatibility Guide (CCG) for the list of components that Moxa has validated to be compatible with this product. You can download the CCG from the Moxa product website.

For components with a Moxa P/N, you can order the components together with your product from Moxa and we will install the selected components in your product. Moxa guarantees the compatibility of the components installed in your CTO product.

Package Checklist

- V2406A embedded computer
- Wall-mounting kit
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

Type		Model Name	Description
Ethernet			
	Cable & Connector	CBL-M12XMM8PRJ45-BK-100-IP67	8-pin male X-coded M12-to-RJ45 Cat-5E UTP gigabit Ethernet cable, 1 meter, IP67-rated
	Connector	M12X-8PMM-IP67	8-pin male X-coded circular threaded gigabit Ethernet connector, IP67-rated (for field installation)
Mounting Kits			
	Isolated Wall-mounting Kit	V2400 Isolated Wall-mounting Kit	Wall-mounting kit with isolation protection, including two wall-mounting brackets and four screws
	DIN-Rail Mounting Kit	DK-DC50131-01	DIN-rail mounting kit, including two DIN-rail brackets and eight screws
Power			
	Cable	CBL-M12(FF5P)/Open-100 IP67	5-pin female A-coded M12 power cable, 1 meter, IP67-rated
	Connector	M12A-5P-IP68	5-pin male circular threaded A-coded M12 power connector, IP68-rated (for field installation)
	Adapter	PWR-24250-DT-S1	Power adapter for testing and system development in the office under ambient temperature conditions: Input: 100 to 240 VAC, 50 to 60 Hz, 1.5 A Output: 24 VDC, 2.5 A, 60 W
	Power Cord	PWC-C7US-2B-183	Power cord with 2-pin connector, USA plug
	Power Cord	PWC-C7EU-2B-183	Power cord with 2-pin connector, Euro plug
	Power Cord	PWC-C7UK-2B-183	Power cord with 2-pin connector, British plug
	Power Cord	PWC-C7AU-2B-183	Power cord with 2-pin connector, Australia plug
	Power Cord	PWC-C7CN-2B-183	Power cord with 2-pin connector, China plug
Audio			
	Connector	M12A-8PMM-IP67	8-pin male circular threaded A-coded M12 connector, IP67-rated (for field-installation)
USB			
	Connector	M12A-5PMM-IP68	5-pin male circular threaded D-coded M12 USB connector, IP68-rated
Storage Kit			
	Internal Storage Kit	FK-75125-02	Hard disk installation package (for HDD, SSD, EN 50155) (only available for the V2406A and V2426A series)
Battery			
	Battery Kit	RTC Battery Kit	Lithium battery with built-in connector for easy replacement

V2416A Series

Compact, fanless, anti-vibration railway computers

- Intel Celeron/Core i7 high performance network video recorder for rolling stock applications
- Two hot-swappable trays for 2.5-inch HDD/SSD storage expansion
- API Library for easy development and storage volume notification
- Dual independent DVI-I displays
- 2 gigabit Ethernet ports with M12 X-coded connectors
- 2 CFast sockets for OS backup
- M12 A-coded power connector
- Compliant with EN 50121-4
- Complies with a portion of EN 50155 specifications
- IEC 61373 certified for shock and vibration resistance
- -40 to 70°C wide temperature models available
- Supports SNMP-based system configuration, control, and monitoring (Windows Embedded Standard 7 only)

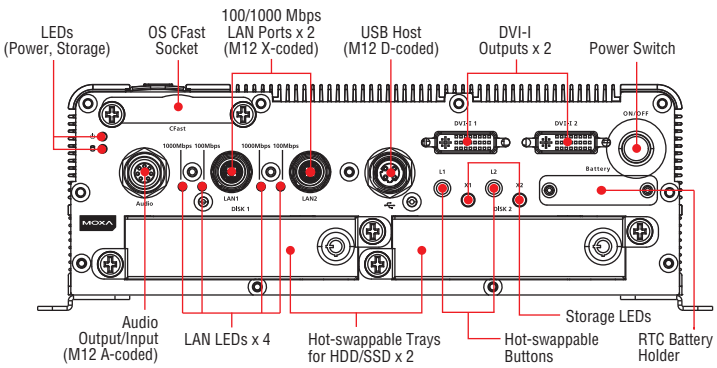
Introduction

The V2416A Series embedded computers are based on the Intel 3rd generation processor and feature 4 RS-232/422/485 serial ports, dual LAN ports, and 3 USB 2.0 hosts. In addition, the V2416A computers provide dual DVI-I outputs and comply with a portion of EN 50155 specifications, covering operating temperature, power input voltage, surge, ESD, and vibration, making them suitable for a variety of industrial applications.

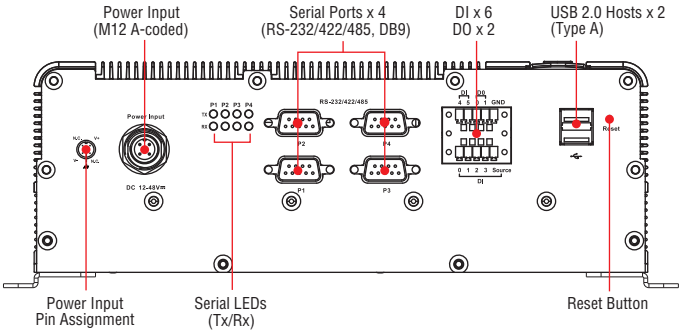
The CFast socket, SATA connectors, and USB sockets provide the V2416A computers with the reliability needed for industrial applications that require data buffering and storage expansion. Most importantly, the V2416A computers come with 2 hot-swappable storage trays for inserting additional storage media, such as hard disk or solid-state drives, and support hot swapping for convenient, fast, and easy storage replacement. Each storage tray has its own LED to indicate whether or not a storage module is plugged in. The V2416Aseries computers come pre-installed with a choice of Linux Debian 7 or Windows Embedded Standard 7 to provide programmers with a familiar environment in which to develop sophisticated, bug-free application software at a low cost.

Appearance

Front View



Rear View



Hardware Specifications

Computer

CPU:
• Intel Celeron 1047UE processor (2M cache, 1.40 GHz) for the V2416A-C2 series
• Intel Core i7-3517UE processor (6M cache, 1.7 GHz) for the V2416A-C7 series
OS: Windows Embedded Standard 7 or Linux Debian 7
System Chipset: Mobile Intel® HM65 Express
System Memory: 1 DDR3-1600 SO-DIMM SDRAM slot, 8 GB max., 4 GB pre-installed
USB: USB 2.0 hosts x 3 (Type A connectors x 2, supporting system boot up, M12 connectors x 1)

Storage

HDD/SSD Support: 2 hot-swappable trays for 2.5-inch HDD/SSD storage expansion*
*Storage drive not included. Must be purchased separately.
CFast Support: 1 slot for OS*, 1 slot for backup storage
*32-bit W7E requires at least an 8 GB CFast card
*64-bit W7E requires at least a 16 GB CFast card (optional)
*Linux Debian 7 requires at least an 8 GB CFast card (must be purchased separately)

Other Peripherals

Audio: Line-in, line-out interface (M12 A-coded)

Display

Graphics Controller: Intel® HD Graphics 4000 (integrated)
Connector Type: 2 DVI-I connectors
Display Interface:
DVI up to 1920x1200 resolution @ 60 Hz
VGA up to 1920x1200 resolution @ 60 Hz
VGA up to 2048x1536 resolution @ 75 Hz

Ethernet Interface

LAN: Auto-sensing 10/100/1000 Mbps ports (M12 X-coded) x 2
Isolation Protection: 1.5 kV

Serial Interface

Serial Standards: 4 software-selectable RS-232/422/485 ports (DB9 male)
ESD Protection: 4 kV for all signals
Isolation Protection: 1.5 kV

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 kbps (non-standard baudrates supported; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Digital Input

Input Channels: 6
Input Voltage: 0 to 30 VDC at 25 Hz
Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open
Digital Input Levels for Wet Contacts:
• Logic level 0: +3 V max.
• Logic level 1: +10 V to +30 V (Source to DI)
Isolation: 3 kV optical isolation

Digital Output

Output Channels: 2, sink type
Output Current: Max. 200 mA per channel
On-State Voltage: 24 VDC nominal, open collector to 30 VDC
Connector Type: 10-pin screw-fastened Euroblock terminal (6 inputs, 2 outputs, DI Source, GND)
Isolation: 3 kV optical isolation

LEDs

System: Power x 1, Storage x 1, hot-swappable trays x 2
LAN: 2 per port (10/100/1000 Mbps)
Serial: 2 per port (Tx and Rx)

Switches and Buttons

Power Switch: on/off (front panel)
Reset Button: For warm reboot (front panel)
Hot-swappable: trigger (on each removable tray)

Physical Characteristics

Housing: Aluminum
Weight: 4 kg (8.98 lb)
Dimensions:
Without ears: 250 x 86 x 154 mm (9.84 x 3.38 x 6.06 in)
With ears: 275 x 92 x 154 mm (10.83 x 3.62 x 6.06 in)
Mounting: Wall, DIN rail (optional), VESA (optional)

Environmental Limits

Operating Temperature*:
Standard models: -25 to 55°C (-13 to 131°F)
Wide temp. models: -40 to 70°C (-40 to 158°F)
Storage Temperature*: -40 to 85°C (-40 to 185°F)
*without HDD installed
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: EN 50155 standard
Anti-Shock: EN 50155 standard
Conformal Coating: Available on request

Power Requirements

Input Voltage: 12 to 48 VDC (M12 A-coded)
Note: Compliant with EN 50155 at 24 VDC
Input Current:
• 3.3 A @ 12 VDC
• 0.82 A @ 48 VDC
Power Consumption: 40 W

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact 6: kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Green Product: RoHS, CRoHS, WEEE
Rail Traffic: EN 50155*, EN 50121-3-2, EN 50121-4, IEC 60571
*Complies with a portion of EN 50155 specifications. Please contact Moxa or a Moxa distributor for details.

Reliability

Automatic Reboot Trigger: Software-programmable watchdog timer configurable from 1 to 255 seconds

MTBF (mean time between failures)

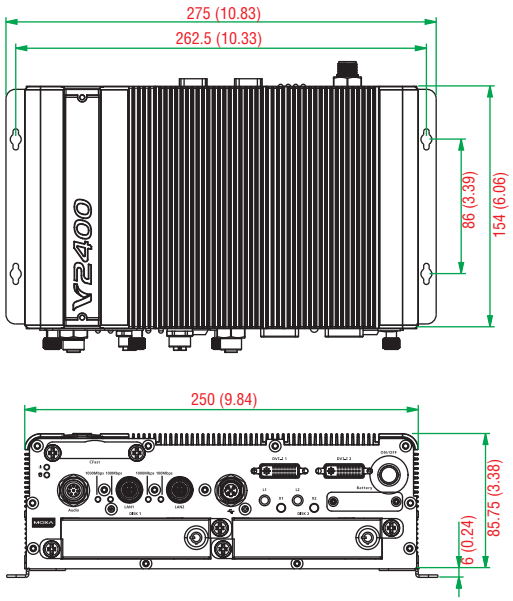
Time: 332,173 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

Warranty Period: 3 years
Details: See www.moxa.com/warranty
Note: These hardware specifications describe the embedded computer unit itself, but not its official accessories. In particular, the wide temperature specification does not apply to accessories such as power adapters and cables.

Dimensions

Unit: mm (inch)



Software Specifications

Linux

OS: Linux Debian 7
Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML
Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network
File System: EXT 4
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, Netfilter/iptables
Secure Shell for Remote Access: SSH allows remote logins to a secure encrypted console from any connected network dial-up
Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the Point-to-Point Protocol (PPP). Works with 'chat', 'dip', and 'dialup', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell)
File Server: Enables remote clients to access files and other resources over the network
Watchdog: A watchdog timer that triggers a system reset upon software freezes, for both specific applications and system-wide failures.

Application Development Software:
- Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
- GNU C library
- Perl

Windows Embedded Standard 7

Core OS:
- 32-bit or 64-bit supported
- Remote Client
- Remote Procedure Call

Applications and Services Development:
- .Net Framework 4.5
- Remote Desktop Protocol 7.1
- COM OLE Application Support
- COM+ Application Support
- MSMQ

Internet Services:
- Internet Explorer 11
- IIS 7.0

File Systems and Data Storage:
- Windows Data Access Components
- Windows Backup and Restore

Diagnostics:
• Common Diagnostic Tools
• Problem Reports and Solutions
Fonts: Chinese (Trad. and Simp.), Japanese, Korean, Western, Middle Eastern, South East Asian, and South Asian Fonts
Graphics and Multimedia:
• MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
• MPEG Layer-3 Audio Codecs (MP3)
• MPEG4 Decoders
• Windows Media Video VC-1 (WMV) Codecs
• DirectX and Windows Device Experience
• Windows Media Player 12
Management:
• Group Policy Management
• Windows Management Instrument (WMI)
• Windows Update
Networking:
• Extensible Authentication Protocol (EAP)
• Internet Authentication Service
• Telnet Server
• Bluetooth
• Domain Services
• Network Access Protection
• Network and Sharing Center
• Quality of Service
• Remote Access Service (RAS)
• Telephony API Client
• Windows Firewall
• Wireless Networking
Security:
• Credential Roaming Service
• Credentials and Certificate Management
• Windows Authorization Manager (AZMAN)
• Windows Security Center
• Active Directory Rights Management
• Security Base
• Encrypted File System (EFS)
Embedded Features:
• Enhanced Write Filter (EWF)
• File-Based Write Filter (FBWF)
• Message Box Default Reply
• Registry Filter
• WSDAPI for .NET
Embedded Self-Health Diagnostic Software: SNMP-based remote scripting layer for monitoring, reporting, and control
SmartRecovery: BIOS level system recovery tool

Ordering Information

Type	CTO Models						Pre-Configured Models		
Model	V2416A-C2	V2416A-C2-T	V2416A-C2-CT-T	V2416A-C7	V2416A-C7-T	V2416A-C7-CT-T	V2416A-C2-W7E	V2416A-C2-T-W7E	V2416A-C7-T-W7E
Computer									
CPU	Intel Celeron 1047UE 1.4 GHz			Intel Core i7-3517UE 1.7 GHz			Intel Celeron 1047UE 1.4 GHz		Intel Core i7-3517UE 1.7 GHz
Operating System (CTO*)	Optional Note: Windows Embedded Standard 7 (32-bit/64-bit) or Linux Debian 7 (64-bit)						Windows Embedded Standard 7 (32-bit)		
Memory (CTO*)	4 GB pre-installed, can be upgraded to 8 GB						4 GB pre-installed		
USB	USB 2.0 (Type A) x 2 USB 2.0 (M12 D-coded) x 1								
Power Input Voltage	12 to 48 VDC (M12 A-coded)								
Storage									
OS CFast Storage (CTO*)	Optional Note: 32-bit W7E requires at least an 8 GB CFast card, 64-bit W7E requires at least a 16 GB CFast card, and 64-bit Debian7 requires at least an 8 GB CFast card						8 GB CFast card pre-installed		
Backup CFast Storage (CTO*)	Optional								
SSD / HDD Storage (CTO*)	EN 50155 anti-vibration 2.5-inch SSD / HDD hot-swappable storage trays x 2 Note: Storage drive must be purchased separately								
Interface									
Display Interface	DVI-I x 2								
Audio Interface	Line in/out (M12 A-coded) x 1								
Ethernet Interface	10/100/1000 Mbps (M12 X-coded) x 2								
Serial Ports	RS-232/422/485 (DB9) x 4								
Digital Input Channels	6								
Digital Output Channels	2								
Environmental Limits									
Operating Temperature	T1: -25 to 55°C	TX: -40 to 70°C		T1: -25 to 55°C	TX: -40 to 70°C		T1: -25 to 55°C	TX: -40 to 70°C	
Conformal Coating	–		Yes	–		Yes	–		

*CTO = Configure To Order
Note:
Please refer to the Component Compatibility Guide (CCG) for the list of components that Moxa has validated to be compatible with this product. You can download the CCG from the Moxa product website.
For components with a Moxa P/N, you can order the components together with your product from Moxa and we will install the selected components in your product. Moxa guarantees the compatibility of the components installed in your CTO product.

Package Checklist

- V2416A series embedded computer
- Wall-mounting kit
- 8 screws for hot-swappable HDD trays
- 8 HDD soft washers
- 2 keys for hot-swappable HDD trays
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

Type		Model Name	Description
Ethernet			
	Cable & Connector	CBL-M12XMM8PRJ45-BK-100-IP67	8-pin male X-coded M12-to-RJ45 Cat-5E UTP gigabit Ethernet cable, 1 meter, IP67-rated
	Connector	M12X-8PMM-IP67	8-pin male X-coded circular threaded gigabit Ethernet connector, IP67-rated (for field installation)
Mounting Kits			
	Isolated Wall-mounting Kit	V2400 Isolated Wall-mounting Kit	Wall-mounting kit with isolation protection, including two wall-mounting brackets and four screws
	DIN-Rail Mounting Kit	DK-DC50131-01	DIN-rail mounting kit, including two DIN-rail brackets and eight screws
Power			
	Cable	CBL-M12(FF5P)/Open-100 IP67	5-pin female A-coded M12 power cable, 1 meter, IP67-rated
	Connector	M12A-5P-IP68	5-pin male circular threaded A-coded M12 power connector, IP68-rated (for field installation)
	Adapter	PWR-24250-DT-S1	Power adapter for testing and system development in the office under ambient temperature conditions: Input: 100 to 240 VAC, 50 to 60 Hz, 1.5 A Output: 24 VDC, 2.5 A, 60 W
	Power Cord	PWC-C7US-2B-183	Power cord with 2-pin connector, USA plug
	Power Cord	PWC-C7EU-2B-183	Power cord with 2-pin connector, Euro plug
	Power Cord	PWC-C7UK-2B-183	Power cord with 2-pin connector, British plug
	Power Cord	PWC-C7AU-2B-183	Power cord with 2-pin connector, Australia plug
	Power Cord	PWC-C7CN-2B-183	Power cord with 2-pin connector, China plug
Audio			
	Connector	M12A-8PMM-IP67	8-pin male circular threaded A-coded M12 connector, IP67-rated (for field-installation)
USB			
	Connector	M12A-5PMM-IP68	5-pin male circular threaded D-coded M12 USB connector, IP68-rated
Battery			
	Battery Kit	RTC Battery Kit	Lithium battery with built-in connector for easy replacement

V2426A Series

Compact, fanless, anti-vibration railway computer

- Intel Celeron/Intel Core i7 processor suitable for diverse computing demands
- 2 peripheral expansion slots for various I/O, WLAN, mini-PCIe expansion module cards
- Dual independent DVI-I displays
- 2 gigabit Ethernet ports with M12 X-coded connectors
- 1 SATA connector and CFast socket for storage expansion
- M12 A-coded power connector
- Compliant with EN 50121-4
- Complies with a portion of EN 50155 specifications
- Ready-to-run Windows Embedded Standard 7 or Linux Debian 7 platform
- -40 to 70°C wide temperature models available
- Supports SNMP-based system configuration, control, and monitoring (Windows Embedded Standard 7 only)

Overview

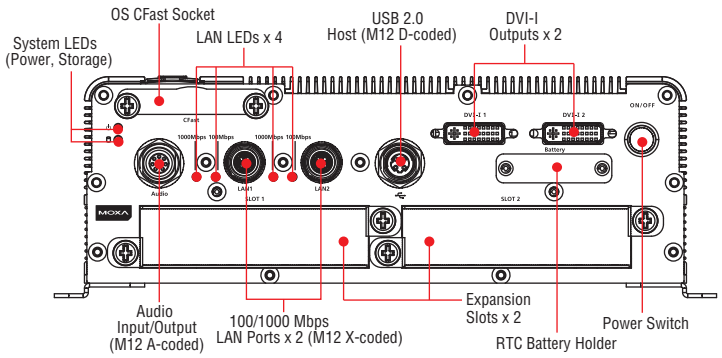
The V2426A Series embedded computers are based on the Intel 3rd generation processor, and feature 4 RS-232/422/485 serial ports, dual LAN ports, 3 USB 2.0 hosts, and dual DVI-I outputs. In addition, the V2426A Series computers comply with a portion of EN 50155 specifications, covering operating temperature, power input voltage, surge, ESD, and vibration, making them suitable for a variety of industrial applications.

The dual megabit/gigabit Ethernet ports with M12 X-coded connectors offer a reliable solution for network redundancy, promising continuous operation for data communication and management. As an added convenience, the V2426A computers have 6 DIs and 2 DOs for connecting digital input/output devices. In addition, the CFast socket, SATA connector, and USB sockets provide the V2426A computers with the reliability needed for industrial applications that require data buffering and storage expansion. Moreover, the V2426A computers come with 2 peripheral expansion slots for inserting different communication modules (2-port CAN module, or HSDPA, GPS, or WLAN module), an 8+8-port digital input/output module, and a 2-port serial module, giving greater flexibility for setting up different industrial applications at field sites.

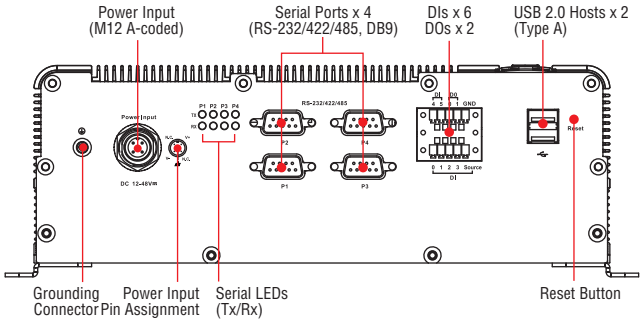
Pre-installed with Linux Debian 7 or Windows Embedded Standard 7, the V2426A Series provides programmers with a friendly environment for developing sophisticated, bug-free application software at a low cost. Wide temperature models of the V2426A Series that operate reliably in a -40 to 70°C operating temperature range are also available, offering an optimal solution for applications subjected to harsh environments.

Appearance

Front View



Rear View



Hardware Specifications

Computer

CPU:
• Intel Celeron 1047UE processor (2M cache, 1.40 GHz) for the V2406A-C2 series
• Intel Core i7-3517UE processor (6M cache, 1.7 GHz) for the V2406A-C7 series
OS: Windows Embedded Standard 7 or Linux Debian 7
System Chipset: Mobile Intel® HM65 Express
System Memory: 1 DDR3-1600 SO-DIMM SDRAM slot, 8 GB max., 4 GB pre-installed
USB: USB 2.0 hosts x 3 (Type A connectors x 2, M12 D-coded x 1)

Storage

HDD/SSD Support: 1 internal SATA-II bus for 2.5-inch HDD/SSD storage expansion*
*Storage drive not included. Must be purchased separately.
CFast Support: 1 slot for OS*, 1 slot for backup storage
*32-bit W7E requires at least an 8 GB CFast card
*64-bit W7E requires at least a 16 GB CFast card (optional)
*Linux Debian 7 requires at least an 8 GB CFast card (to be purchased separately)

Other Peripherals

Audio: Line-in, line-out interface (M12 A-coded)
Expansion Slot: 2 peripheral expansion slots

Display

Graphics Controller: Intel® HD Graphics 4000 (integrated)
Connector Type: 2 DVI-I connectors
Display Interface:
DVI up to 1920x1200 resolution @ 60 Hz
VGA up to 1920x1200 resolution @ 60 Hz
VGA up to 2048x1536 resolution @ 75 Hz

Ethernet Interface

LAN: Auto-sensing 10/100/1000 Mbps ports (M12 X-coded) x 2
Isolation Protection: 1.5 kV

Serial Interface

Serial Standards: 4 RS-232/422/485 ports, software selectable (DB9 male)
ESD Protection: 4 kV for all signals
Isolation Protection: 1.5 kV

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 kbps (non-standard baudrates supported; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Digital Input

Input Channels: 6
Input Voltage: 0 to 30 VDC at 25 Hz
Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open
Digital Input Levels for Wet Contacts:
• Logic level 0: +3 V max.
• Logic level 1: +10 V to +30 V (Source to DI)
Isolation: 3 kV optical isolation

Digital Output

Output Channels: 2, sink type
Output Current: Max. 200 mA per channel
On-State Voltage: 24 VDC nominal, open collector to 30 VDC
Connector Type: 10-pin screw-fastened Euroblock terminal (6 inputs, 2 outputs, DI Source, GND)
Isolation: 3 kV optical isolation

LEDs

System: Power, Storage
LAN: 2 per port (10/100/1000 Mbps)
Serial: 2 per port (Tx and Rx)

Switches and Buttons

Power Switch: on/off (front panel)
Reset Button: For warm reboot (rear panel)

Physical Characteristics

Housing: Aluminum
Weight: 3 kg (6.67 lb)
Dimensions:
Without ears: 250 x 86 x 154 mm (9.84 x 3.38 x 6.06 in)
With ears: 275 x 92 x 154 mm (10.83 x 3.62 x 6.06 in)
Mounting: Wall, DIN rail (optional), VESA (optional)

Environmental Limits

Operating Temperature*:
Standard models: -25 to 55°C (-13 to 131°F)
Wide temp. models: -40 to 70°C (-40 to 158°F)
Storage Temperature*: -40 to 85°C (-40 to 185°F)
*without HDD installed
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: EN 50155 standard
Anti-Shock: EN 50155 standard
Conformal Coating: Available on request

Power Requirements

Input Voltage: 12 to 48 VDC (M12 A-coded)
Note: Compliant with EN 50155 at 24 VDC
Input Current:
• 3.78 A @ 12 VDC
• 0.96 A @ 48 VDC
Power Consumption: 47 W

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact 6: kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Green Product: RoHS, CRoHS, WEEE
Rail Traffic: EN 50155*, EN 50121-3-2, EN 50121-4 , IEC 60571
*Complies with a portion of EN 50155 specifications. Please contact Moxa or a Moxa distributor for details.

Reliability

Automatic Reboot Trigger: Software-programmable watchdog timer configurable from 1 to 255 seconds

MTBF (mean time between failures)

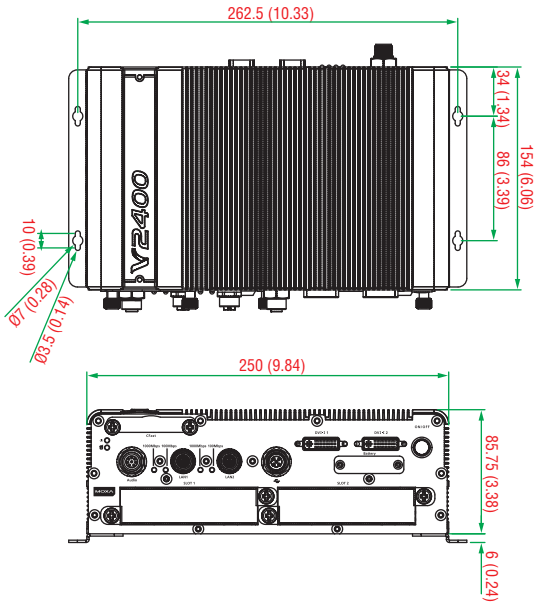
Time: 304,998 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

Warranty Period: 3 years
Details: See www.moxa.com/warranty
Note: These hardware specifications describe the embedded computer unit itself, but not its official accessories. In particular, the wide temperature specification does not apply to accessories such as power adapters and cables.

Dimensions

Unit: mm (inch)



Software Specifications

Linux

OS: Linux Debian 7
Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML
Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network
File System: EXT 4
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, Netfilter/iptables
Secure Shell for Remote Access: SSH allows remote logins to a secure encrypted console from any connected network dial-up
Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).
File Server: Enables remote clients to access files and other resources over the network
Watchdog: A watchdog timer that triggers a system reset upon software freezes, for both specific applications and system-wide failures.

Application Development Software:
- Moxa API Library (Watchdog timer, Moxa serial I/O control)
- GNU C library
- Perl

Windows Embedded Standard 7

Core OS:
- 32-bit or 64-bit supported
- Remote Client
- Remote Procedure Call

Applications and Services Development:
- .Net Framework 4.5
- Remote Desktop Protocol 7.1
- COM OLE Application Support
- COM+ Application Support
- MSMQ

Internet Services:
- Internet Explorer 11
- IIS 7.0

File Systems and Data Storage:
- Windows Data Access Components
- Windows Backup and Restore

Diagnostics:
• Common Diagnostic Tools
• Problem Reports and Solutions
Fonts: Chinese (Trad. and Simp.), Japanese, Korean, Western, Middle Eastern, South East Asian, and South Asian Fonts
Graphics and Multimedia:
• MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
• MPEG Layer-3 Audio Codecs (MP3)
• MPEG4 Decoders
• Windows Media Video VC-1 (WMV) Codecs
• DirectX and Windows Device Experience
• Windows Media Player 12
Management:
• Group Policy Management
• Windows Management Instrument (WMI)
• Windows Update
Networking:
• Extensible Authentication Protocol (EAP)
• Internet Authentication Service
• Telnet Server
• Bluetooth
• Domain Services
• Network Access Protection
• Network and Sharing Center
• Quality of Service
• Remote Access Service (RAS)
• Telephony API Client
• Windows Firewall
• Wireless Networking
Security:
• Credential Roaming Service
• Credentials and Certificate Management
• Windows Authorization Manager (AZMAN)
• Windows Security Center
• Active Directory Rights Management
• Security Base
• Encrypted File System (EFS)
Embedded Features:
• Enhanced Write Filter (EWF)
• File-Based Write Filter (FBWF)
• Message Box Default Reply
• Registry Filter
• WSDAPI for .NET
Embedded Self-Health Diagnostic Software: SNMP-based remote scripting layer for monitoring, reporting, and control
SmartRecovery: BIOS level system recovery tool

Ordering Information

Type	CTO Models						Pre-Configured Models		
Model	V2426A-C2	V2426A-C2-T	V2426A-C2-CT-T	V2426A-C7	V2426A-C7-T	V2426A-C7-CT-T	V2426A-C2-W7E	V2426A-C2-T-W7E	V2426A-C7-T-W7E
Computer									
CPU	Intel Celeron 1047UE 1.4 GHz			Intel Core i7-3517UE 1.7 GHz			Intel Celeron 1047UE 1.4 GHz		Intel Core i7-3517UE 1.7 GHz
Operating System (CTO*)	Optional Note: Windows Embedded Standard 7 (32-bit/64-bit) or Linux Debian 7 (64-bit)						Windows Embedded Standard 7 (32-bit)		
Memory (CTO*)	4 GB pre-installed, can be upgraded to 8 GB						4 GB pre-installed		
USB	USB 2.0 (Type A) x 2 USB 2.0 (M12 D-coded) x 1								
Power Input Voltage	12 to 48 VDC (M12 A-coded)								
Storage									
OS CFast Storage (CTO*)	Optional Note: 32-bit W7E requires at least an 8 GB CFast card, 64-bit W7E requires at least a 16 GB CFast card, and 64-bit Debian7 requires at least an 8 GB CFast card						8 GB CFast card pre-installed		
Backup CFast Storage (CTO*)	Optional								
SSD / HDD Storage (CTO*)	SSD / HDD to be purchased separately Note: Anti-vibration storage kit (FK-75125-02) must be purchased separately to install an SSD / HDD								
Interface									
Display Interface	DVI-I x 2								
Audio Interface	Line in/out (M12 A-coded) x 1								
Ethernet Interface	10/100/1000 Mbps (M12 X-coded) x 2								
Serial Ports	RS-232/422/485 (DB9) x 4								
Digital Input Channels	6								
Digital Output Channels	2								
Environmental Limits									
Operating Temperature	T1: -25 to 55°C	TX: -40 to 70°C		T1: -25 to 55°C	TX: -40 to 70°C		T1: -25 to 55°C	TX: -40 to 70°C	
Conformal Coating	–		Yes	–		Yes	–		
Other Peripherals									
Peripheral Expansion Card	Peripheral expansion slots x 2 Note: Peripheral expansion cards must be purchased separately. Please refer to the "Peripheral Expansion Modules" table below.								

*CTO = Configure To Order
Note:
Please refer to the Component Compatibility Guide (CCG) for the list of components that Moxa has validated to be compatible with this product. You can download the CCG from the Moxa product website.
For components with a Moxa P/N, you can order the components together with your product from Moxa and we will install the selected components in your product. Moxa guarantees the compatibility of the components installed in your product though CTO.

Package Checklist

- V2426A embedded computer
- Wall-mounting kit
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

Type		Model Name	Description
Ethernet			
	Cable & Connector	CBL-M12XMM8PRJ45-BK-100-IP67	8-pin male X-coded M12-to-RJ45 Cat-5E UTP gigabit Ethernet cable, 1 meter, IP67-rated
	Connector	M12X-8PMM-IP67	8-pin male X-coded circular threaded gigabit Ethernet connector, IP67-rated (for field installation)
Mounting Kits			
	Isolated Wall Wall-mounting	V2400 Isolated Wall-mounting Kit	Wall-mounting kit with isolation protection, including two wall-mounting brackets and four screws
	DIN-Rail Mounting Kit	DK-DC50131-01	DIN-rail mounting kit, including two DIN-rail brackets and eight screws
Power			
	Cable	CBL-M12(FF5P)/Open-100 IP67	5-pin female A-coded M12 power cable, 1 meter, IP67-rated
	Connector	M12A-5P-IP68	5-pin male circular threaded A-coded M12 power connector, IP68-rated (for field installation)
	Adapter	PWR-24250-DT-S1	Power adapter for testing and system development in the office under ambient temperature conditions: Input: 100 to 240 VAC, 50 to 60 Hz, 1.5 A Output: 24 VDC, 2.5 A, 60 W
	Power Cord	PWC-C7US-2B-183	Power cord with 2-pin connector, USA plug
	Power Cord	PWC-C7EU-2B-183	Power cord with 2-pin connector, Euro plug
	Power Cord	PWC-C7UK-2B-183	Power cord with 2-pin connector, British plug
	Power Cord	PWC-C7AU-2B-183	Power cord with 2-pin connector, Australia plug
	Power Cord	PWC-C7CN-2B-183	Power cord with 2-pin connector, China plug
Audio			
	Connector	M12A-8PMM-IP67	8-pin male circular threaded A-coded M12 connector, IP67-rated (for field-installation)
USB			
	Connector	M12A-5PMM-IP68	5-pin male circular threaded D-coded M12 USB connector, IP68-rated
Storage Kit			
	Internal Storage Kit	FK-75125-02	Hard disk installation package (for HDD, SSD, EN 50155) (only available for the V2406A and V2426A series)
Battery			
	Battery Kit	RTC Battery Kit	Lithium battery with built-in connector for easy replacement

Peripheral Expansion Modules

	Model name	Description
	EPM-DK02	2 mini PCIe slots, -25 to 55°C operating temperature when used with a Moxa recommended wireless module Note: See the "Wireless Accessory Packages" table below to select a wireless accessory package.
	EPM-DK03	GPS receiver with 2 mini PCIe slots, -25 to 55°C operating temperature when used with a Moxa recommended wireless module (3G x 1 + WiFi x 1) Note: See the "Wireless Accessory Packages" table below to select a wireless accessory package.
	EPM-3032	2 isolated RS-232/422/485 ports with DB9 connectors, -40 to 70°C operating temperature
	EPM-3112	2 isolated CAN ports with DB9 connectors, -25 to 55°C operating temperature
	EPM-3438	8 DIs and 8 DOs, with 3 kV digital isolation protection, 2 kHz counter, -40 to 70°C operating temperature

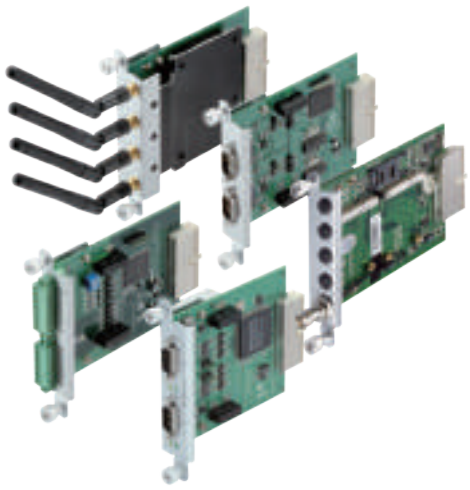
Wireless Accessory Packages

Note: These packages are for the EPM-DK02 and EPM-DK03 only

Type	Model Name	Item	Description
	EPM-DK Wi-Fi Package	Mini-PCIe Card	SprakLAN WPEA-121N Wi-Fi mini card x 1, bracket x 1, silver screws x 2, black screws x 4
		Digital Interface	Mini card internal antenna with QMA connectors x 2, locking washers x 2, O-rings x 2, nuts x 2
	EPM-DK 3G Package	Mini-PCIe Card	Gemalto PHS8-P 3G mini card x 1, black screws x 4
		Thermal Pad	Cellular mini card thermal pad x 1
		Digital Interface	Mini card internal antenna with QMA connector x 1, locking washer x 1, O-ring x 1, nut x 1
	EPM-DK LTE-US Package	Mini-PCIe Card	Gemalto PLS8-US LTE mini card x 1, black screws x 4
		Thermal Pad	Cellular mini card thermal pad x 1
		Digital Interface	Mini card internal antenna with QMA connector x 1, locking washer x 1, O-ring x 1, nut x 1
	EPM-DK LTE-EU Package	Mini-PCIe Card	Gemalto PLS8-E LTE mini card x 1, black screws x 4
		Thermal Pad	Cellular mini card thermal pad x 1
		Digital Interface	Mini card internal antenna with QMA connector x 1, locking washer x 1, O-ring x 1, nut x 1
	A-CRF-CTPSF-R2-50	GPS Extension Cable	TNC to SMA (female) adapter with 50 cm cable x 1
	ANT-GPS-OSM-05-3M	GPS External Antenna	26 dBi, 1572 MHz, L1 band SMA antenna x 1
	A-CRF-MHFQMAF-D1.13-14.2	Digital Interface	Mini card internal antenna with QMA connector x 1, locking washer x 1, O-ring x 1, nut x 1
	ANT-WDB-ARM-02	Wi-Fi External Antenna	Wi-Fi external antenna with SMA connector x 1
	ANT-WCDMA-AHSM-04-2.5m	3G External Antenna	3G external antenna with SMA connector x 1
	ANT-LTEUS-ASM-01	LTE-US External Antenna	LTE-US external antenna with SMA connector x 1
	ANT-LTE-ASM-02	LTE-EU External Antenna	LTE-EU external antenna with SMA connector x 1
	A-CRF-RFQMAM-R2-50	Wi-Fi Extension Cable	QMA (male) to SMA (male) adapter with 50 cm cable x 1
	A-CRF-QMAMSF-R2-50	Cellular Extension Cable	QMA (male) to SMA (female) adapter with 50 cm cable x 1

V2400 Series Expansion Modules

Expansion peripheral modules (EPM) for the V2400 series



- EPM-3032: 2 isolated RS-232/422/485 ports with DB9 connectors
- EPM-3112: 2 isolated CAN ports with DB9 connectors
- EPM-3438: 8+8 DI/DO with 3 kV digital isolation protection, 2 kHz counter
- EPM-DK02*: 2 mini PCIe slots
- EPM-DK03*: GPS receiver, 2 mini PCIe slots

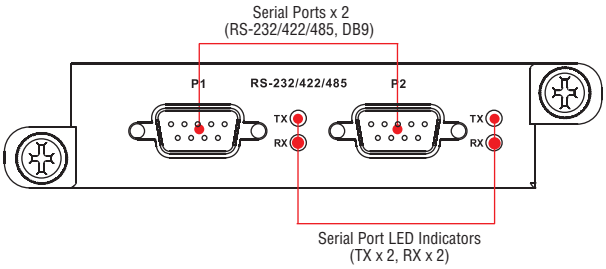
*Operating Temperature:
w/o wireless module: EN 50155 Class TX
w/ wireless module: EN 50155 Class T1

Introduction

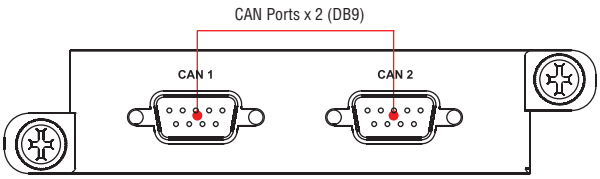
Moxa's V2400 series expansion modules, which come with serial ports, CAN ports, wireless and GPS cards, digital input/output channel cards, mini PCI and PCIe modules, a 2-slot mini-PCIe module, and VGA or DVI-I display connectors, can be used with Moxa's V2426 embedded computers, and give end-users the best flexibility for setting up and expanding a variety of industrial applications.

Appearance

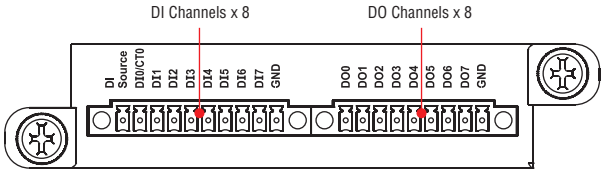
EPM-3032



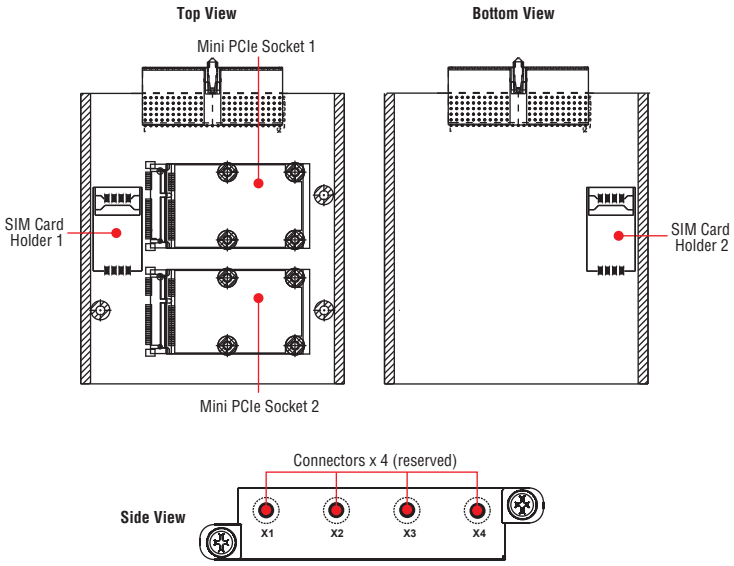
EPM-3112



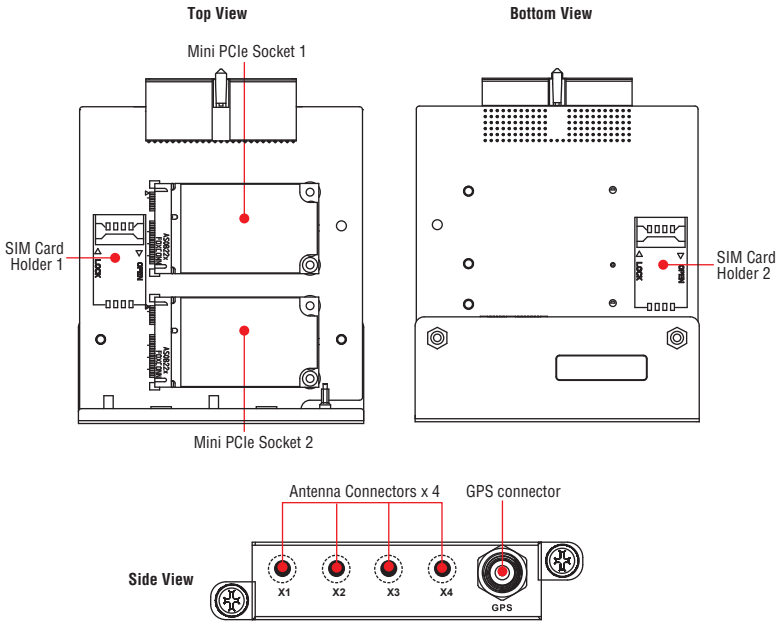
EPM-3438



EPM-DK02



EPM-DK03



EPM-3032 Specifications

Serial Interface

Serial Standards: 2 RS-232/422/485 ports, software-selectable (DB9 male)
Isolation: 2 kV digital isolation

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 kbps (non-standard baudrates supported; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Physical Characteristics

Weight: 137 g (0.30 lb)
Dimensions: 104 x 121 x 34 mm (4.09 x 4.76 x 1.34 in)

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 158°F), EN 50155 Class TX

EPM-3112 Specifications

CANbus Communication

Interface: 2 optically isolated CAN2.0A/2.0B compliant ports
CAN Controller: Phillips SJA1000T
Signals: CAN_H, CAN_L
Isolation: 2 kV digital isolation
Speed: 1 Mbps
Connector Type: DB9 male

Physical Characteristics

Weight: 127 g (0.28 lb)
Dimensions: 104 x 121 x 34 mm (4.09 x 4.76 x 1.34 in)

Environmental Limits

Operating Temperature: -25 to 55°C (-13 to 131°F), EN 50155 Class T1

EPM-3438 Specifications

Digital Input

Input Channels: 8
Input Voltage: 0 to 30 VDC at 25 Hz
Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open
Digital Input Levels for Wet Contacts:
• Logic level 0: +3 V max.
• Logic level 1: +10 V to +30 V (Source to DI)
Counter Frequency: 2 kHz (DIO only)
Connector Type: 10-pin screw terminal block (8 DI points, DI Source, GND)
Isolation: 3 kV optical isolation

Digital Output

Output Channels: 8, sink type, 0 to 30 VDC
Output Current: Max. 200 mA per channel
On-state Voltage: 24 VDC nominal, open collector to 30 VDC
Connector Type: 9-pin screw terminal block (8 DO points, GND)
Isolation: 3 kV optical isolation

Physical Characteristics

Weight: 120 g (0.27 lb)
Dimensions: 104 x 121 x 34 mm (4.09 x 4.76 x 1.34 in)

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 158°F), EN 50155 Class TX

EPM-DK02 Specifications

PCI Express Mini Slot

Interface:
• Slot 1: PCI-Express V1.0 (one lane) / USB 2.0
• Slot 2: USB 2.0
USB 2.0 Bus SIM Card Holder: Reserved for cellular applications

Physical Characteristics

Weight: 125 g (0.28 g)

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 158°F), EN 50155 Class TX

EPM-DK03 Specifications

PCI Express Mini Slot

Interface:
• Slot 1: PCI-Express V1.0 (one lane) / USB 2.0
• Slot 2: USB 2.0
USB 2.0 Bus SIM Card Holder: Reserved for cellular applications

Physical Characteristics

Weight: 220 g (0.49 lb)
Dimensions: 104 x 121 x 34 mm (4.09 x 4.76 x 1.34 in)

Environmental Limits

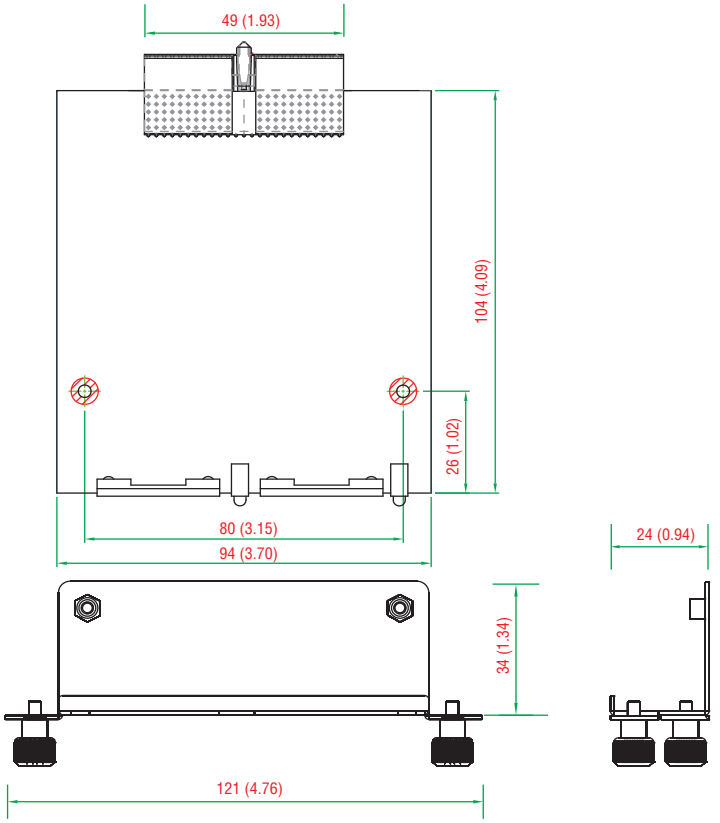
Operating Temperature:
w/o wireless module: -40 to 70°C (-40 to 158°F), EN 50155 Class TX
w/ wireless module: -25 to 55°C (-13 to 131°F), EN 50155 Class T1

GPS Interface

Receiver Types:
• 50-channel u-blox 6 LEA-6 receiver
• GPS L1 C/A code
• GALILEO L1 open service (with upgrade)
• SBAS: WAAS, EGNOS, MSAS, GAGAN
Acquisition:
• Cold starts: 28 s
• Warm starts: 28 s
• Aided starts: 1 s
• Hot starts: 1 s
Sensitivity:
• Tracking: -160 dBm
• Reacquisition: -160 dBm
• Cold starts: -147 dBm
Timing accuracy:
• RMS: 30 ns
• 99%: <60 ns
• Granularity: 21 ns
Accuracy:
• Position: 2.5 m CEP
• SBAS: 2.0 m CEP
Protocols: NMEA, UBX binary, max. update rate: 5 Hz (ROM version)
Time Pulse: 0.25 Hz to 1 kHz
Velocity Accuracy: 0.1 m/s
Heading Accuracy: 0.5 degrees
A-GPS: Supports AssistNow Online and AssistNow Offline, OMA SUPL compliant
Operational Limits: Velocity: 500 m/s (972 knots)

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

EPM-DK02: 2 mini PCIe slots, -25 to 55°C operating temperature
EPM-DK03: GPS receiver, 2 mini PCIe slots, -25 to 55°C operating temperature
EPM-3032: 2 isolated RS-232/422/485 ports with DB9 connectors, -40 to 70°C operating temperature
EPM-3112: 2 isolated CAN ports with DB9 connectors, -25 to 55°C operating temperature
EPM-3438: 8+8 DI/DO with 3 kV digital isolation protection, 2 kHz counter, -40 to 70°C operating temperature

UC-8481 Series

Award-winning Product
TAIWAN EXCELLENCE 2013

Industrial RISC-based mobile Linux computers with cellular, Wi-Fi, and GPS modules, 2 Ethernet, 2 serial, 2 USB 2.0 ports, and 2 mini PCIe sockets

- 512 MB NAND Flash for data storage
- Fanless and rugged design for rolling stock applications
- Complies with a portion of EN 50155 specifications
- Extra Wi-Fi and cellular slots for cross-operator expansions
- Wi-Fi, cellular, and GPS modules for full communications mobility
- Independent, software-based power control of cellular modules
- Ready-to-run embedded Linux operating system
- -25 to 70°C wide temperature models available

Overview

The UC-8481 embedded computer comes with 2 RS-232/422/485 serial ports, 2 Ethernet ports, 4 digital input channels, 4 digital output channels, a CompactFlash socket, and 2 USB 2.0 ports.

The computer uses the Intel XScale IXP435 533 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but will not generate too much heat. The built-in 32 MB NOR Flash ROM and 512 MB SDRAM give you enough memory to run your application software directly on the UC-8481, and the 512 MB NAND Flash can be used to provide additional data storage.

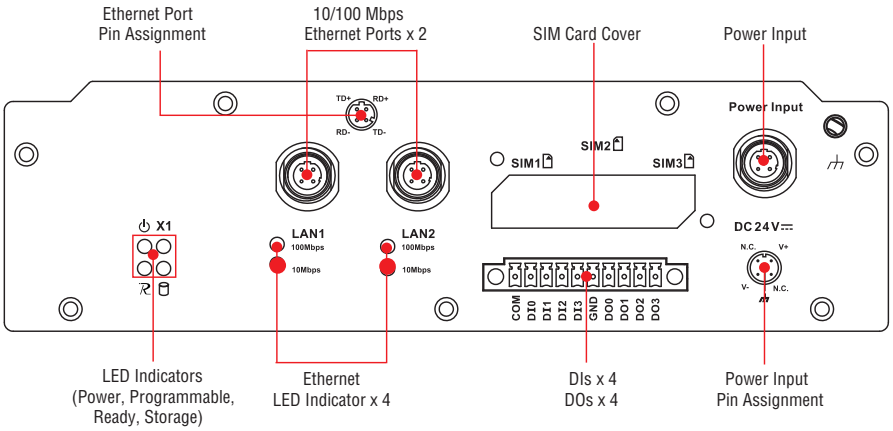
Mostly importantly, the UC-8481 series comes with seven connectors that allow users to connect various wireless and GPS modules, making it particularly well-suited for rolling stock and moving vehicles. The UC-8481 is a convenient cornerstone for customizing intelligent, cost-effective wireless communication platforms.

With an embedded Linux operating system pre-installed, the UC-8481 series provides an open software platform perfect for custom-authored software. Software written on desktop PCs can be easily ported to the UC-8481 via a common compiler, without any modification of code. This makes the UC-8481 an optimal solution for industrial applications, allowing ample customization with minimal cost and effort.

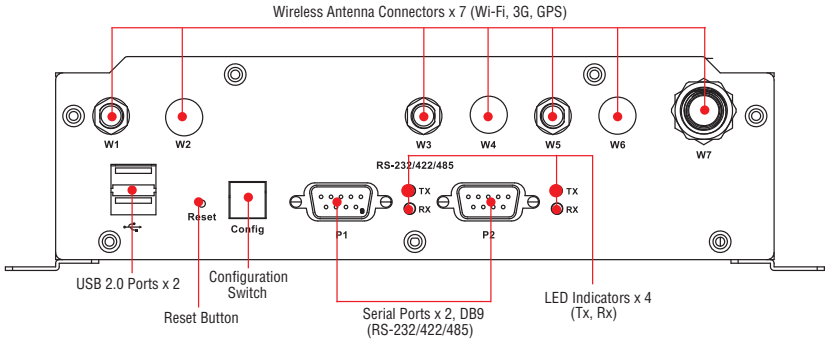
The UC-8481 also comes in a wide-temperature model designed to operate reliably in extreme temperatures ranging from -25 to 70°C.

Appearance

Front View

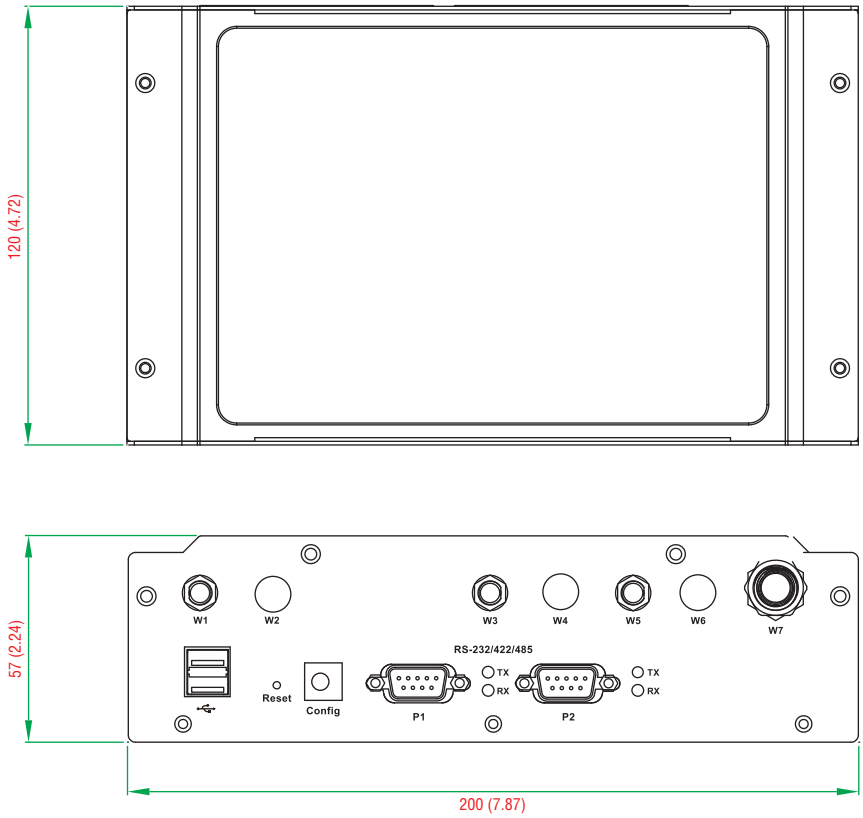


Rear View



Dimensions

Unit: mm (inch)



Hardware Specifications

Computer
CPU: Intel XScale IXP435, 533 MHz
OS: Linux (pre-installed)
USB: USB 2.0 hosts x 2
DRAM: 512 MB DDR2 SDRAM onboard
Flash:
• NOR Flash, 32 MB (max. 32 MB) onboard to store OS
• NAND Flash, 512 MB (max. 1 GB) for OS file system, caching storage, and data logger

Storage
Storage Expansion: CompactFlash socket

Ethernet Interface
LAN: Auto-sensing 10/100 Mbps ports (M12) x 2
Magnetic Isolation Protection: 1.5 kV built in

GPS Module (U-Blox LEA-6S)
Receiver Types:
• 50-channel U-blox 6 engine
• GPS L1 C/A code
• SBAS: WAAS, EGNOS, MSAS, GAGAN
Acquisition:
• Cold starts: 28 s
• Warm starts: 28 s
• Aided starts: 1 s
• Hot starts: 1 s
Sensitivity:
• Tracking: -160 dBm
• Reacquisition: -160 dBm
• Cold starts: -147 dBm
Timing Accuracy:
• RMS: 30 ns
• 99%: <60 ns
• Granularity: 21 ns
Accuracy:
• Position: 2.5 m CEP
• SBAS: 2.0 m CEP
Protocols: NMEA, UBX binary, max. update rate: 5 Hz (ROM version)
Time Pulse: 0.25 Hz to 1 kHz
Velocity Accuracy: 0.1 m/s
Heading Accuracy: 0.5 degrees
A-GPS: Supports AssistNow Online and AssistNow Offline, OMA SUPL compliant
Operational Limits: Velocity: 500 m/s (972 knots)
Connector Type: TNC

WLAN Module (Atheros AR9220)
WAPN001: IEEE 802.11a/b/g/n wireless LAN module with U.FL antenna connector
Standards: IEEE 802.11a/b/g/n for wireless LAN
Connector Type: QMA connector (female type) x 2
Mode: Client

Cellular Module (Cinterion PH8)
Frequency Bands: GSM/GPRS/EDGE/UMTS/HSPA+
Band Options:
• Five band UMTS(WCDMA/FDD)
• 800/850/1900 AWS and 2100 MHz
• Quad-band GSM: 850/900/1800/1900 MHz
HSDPA/HSUPA Data Rates:
DL: 3.6/7.2/14.4 Mbps; UL: 2.0/5.76 Mbps
UMTS Data Rates:
DL: max 384 kbps; UL: max 384 kbps
EDGE Class 12:
DL: max 237 kbps; UL: max 237 kbps
GPRS Class 12:
DL: max 85.6 kbps; UL: max 85.6 kbps
Connector Type: QMA connector (female type) x 1

Serial Interface
Serial Standards: 2 RS-232/422/485 ports, software-selectable (DB9)
Console Port: RS-232 (TxD, RxD, GND), 4-pin pin header output (115200, n, 8, 1)

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals
RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Digital Input
Input Channels: 4
Input Voltage: 0 to 30 VDC
Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open
Digital Input Levels for Wet Contacts:
• Logic level 0: +3 V max.
• Logic level 1: +10 V to +30 V (COM to DI)
Connector Type: 10-pin screw terminal block (4 points, COM, GND)
Isolation: 2 kV optical isolation

Digital Output
Output Channels: 4, sink type
Output Current: Max. 200 mA per channel
On-State Voltage: 24 VDC nominal, open collector to 30 V
Connector Type: 10-pin screw terminal block (4 points, GND)

LEDs
System: Power, Ready, Storage, Programmable
LAN: 10M/Link x 2, 100M/Link x 2 (on connector)
Serial: TxD x 2, RxD x 2
Reset Button: Supports "Reset to Factory Default"

Physical Characteristics
Housing: SECC sheet metal (1 mm)
Weight: 1 kg (2.22 lb)
Dimensions: 200 x 57 x 120 mm (7.87 x 2.24 x 4.72 in)
Mounting: Wall, DIN rail

Environmental Limits
Operating Temperature:
Standard Models: -25 to 55°C (-13 to 131°F)
Wide Temp. Models: -25 to 70°C (-13 to 158°F)
Storage Temperature:
Standard Models: -25 to 75°C (-13 to 167°F)
Wide Temp. Models: -40 to 80°C (-40 to 176°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: IEC 61373 standard
Anti-Shock: IEC 61373 standard

Power Requirements
Input Voltage: 24 VDC (9 to 48 V), M12 connector
Input Current: 833 mA @ 24 VDC
Power Consumption: 20 W

Standards and Certifications
Safety: UL 60950-1, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A

EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Rail Traffic: EN 50155*, EN 50121-2-3, EN 50121-4, IEC 61373
*Complies with a portion of EN 50155 specifications. Please contact Moxa or a Moxa distributor for details.

Reliability
Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)
Time: 195,415 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty
Warranty Period: 5 years (does not apply to cellular module)
Details: See www.moxa.com/warranty
Note: These hardware specifications describe the embedded computer unit itself, but not its official accessories. In particular, the wide temperature specification does not apply to accessories such as power adapters and cables.

Software Specifications

Linux
OS: Linux 2.6.38
Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML
Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network
File System: JFFS2, NFS, Ext2, Ext3, YAFFS2
Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, iptables firewall, OpenSSL
Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).
Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)
Wireless: wpa_supplicant is configured using a text file that lists all accepted networks and security policies, including pre-shared keys.
GPS: gpsd is a daemon that receives data from a GPS receiver, and provides the data back to multiple applications such as Kismet or GPS navigation software.
Application Development Software:
• Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
• GNU C/C++ cross-compiler, supports EABI
• GNU C library
• GDB source-level debugging server
Software Protection: Encryption tool for user executable files (based on patented Moxa technology)

Ordering Information

Available Models
UC-8481-LX: RISC-based industrial wireless mobile computer with 2 LANs, 2 serial ports, 4 DIs, 4 DOs, 2 USB 2.0 hosts, CF, 1 cellular module, 1 Wi-Fi module, 1 GPS module, 2 mini PCIe sockets (USB interface), Linux OS, -25 to 55°C operating temperature (EN 50155 Class T1)
UC-8481-T-LX: RISC-based industrial wireless mobile computer with 2 LANs, 2 serial ports, 4 DIs, 4 DOs, 2 USB 2.0 hosts, CF, 1 cellular module, 1 Wi-Fi module, 1 GPS module, 2 mini PCIe sockets (USB interface), Linux OS, -25 to 70°C operating temperature (EN 50155 Class T3)

Optional Accessories (can be purchased separately)
PWR-24250-DT-S1: Power adapter
PWC-C7US-2B-183: Power cord with 2-pin connector, USA plug
PWC-C7EU-2B-183: Power cord with 2-pin connector, Euro plug
PWC-C7UK-2B-183: Power cord with 2-pin connector, British plug
PWC-C7AU-2B-183: Power cord with 2-pin connector, Australia plug
PWC-C7CN-2B-183: Power cord with 2-pin connector, China plug

M12 Connectors (can be purchased separately)
M12A-5P-IP68: 5-pin female circular threaded A-coded M12 power connector, IP68-rated (for field installation)
M12D-4P-IP68: 4-pin male circular threaded D-coded M12 Ethernet connector, IP68-rated (for field installation)

M12 Cables (can be purchased separately)
CBL-M12(FF5P)/Open-100 IP67: 1-meter A-coded M12-to-5-pin power cable, 5-pin female M12 connector, IP67-rated
CBL-M12D(MM4P)/RJ45-100 IP67: 1-meter D-coded M12-to-RJ45 Cat-5C UTP Ethernet cable, 4-pin male M12 connector, IP67-rated

UC-8481 Wi-Fi Accessory Package
WAPN001: Wireless LAN module, supporting IEEE 802.11 a/b/g/n
Wireless Antenna Connector and Cable: QMA (female) antenna connector with 140 mm cable to Wi-Fi module
Installation Kit: Bronze screws x 3, M2.5 screws x 3, thermal pad x 1

UC-8481 PH8 Cellular Accessory Package
EPM-PH8: Cellular Module
Wireless Antenna Connector and Cable: QMA (female) antenna connector with 140 mm cable to cellular module
Installation Kit: Bronze screw x 1, M2.5 screw x 1, thermal pad x 1

WLAN Cable and Antenna
Cable: QMA (male) to SMA (male) adapter with 50 cm cable
Antenna: 2 dual-band omni-directional antenna (2 dBi, RP-SMA, 2.4/5 GHz)

Cellular Cable and Antenna
Cable: QMA (male) to SMA (female) adapter with 50 cm cable
Antenna: Omni 1 dBi rubber SMA antenna

GPS Cable and Antenna
Cable: TNC to SMA (female) adapter with 50 cm cable
Antenna: 26 dBi, 1572 MHz, L1 band antenna

Package Checklist
- UC-8481 embedded computer
- Wall-mounting kit
- DIN-rail mounting kit
- CBL-4PINDB9F-100: 100 cm console port cable; 4 pin header connector to DB9 female connector
- Documentation and software CD or DVD
- Quick installation guide (printed)

Optional Accessories

Ethernet	Item	Type	Model Name	Description
	1	Cable	CBL-M12D(MM4P)/RJ45-100 IP67	1-meter D-coded M12-to-RJ45 Cat-5C UTP Ethernet cable, 4-pin male M12 connector, IP67-rated
	2	Connector	M12D-4P-IP68	Field-installation D-coded screw-in Ethernet connector, 4-pin male M12 connector, IP68-rated
Power	1	Cable	CBL-M12(FF5P)/OPEN-100 IP67	1-meter A-coded M12-to-5-pin power cable, 5-pin female M12 connector, IP67-rated
	2	Power adapter kit	PWR-24250-DT-S1 adapter w/USA plug	Power adpater, power jack, M12 connector, power cord
	3		PWR-24250-DT-S1 adapter w/Euro plug	Power adpater, power jack, M12 connector, power cord
	4		PWR-24250-DT-S1 adapter w/Australia plug	Power adpater, power jack, M12 connector, power cord
	5		PWR-24250-DT-S1 adapter w/British plug	Power adpater, power jack, M12 connector, power cord
	6		PWR-24250-DT-S1 adapter w/China plug	Power adpater, power jack, M12 connector, power cord
Wi-Fi	1	Cable	A-CRF-RFQMAM-R2-50	QMA (male) to SMA (male) adapter with 50 cm cable
	2	Antenna	ANT-WDB-ARM-02	Omni 1 dBi rubber SMA antenna
	3	Module	UC-8481 Wi-Fi accessory package	WAPN001, wireless module
Cellular	1	Cable	A-CRF-RFQMSF-R2-50	QMA (male) to SMA (female) adapter with 50 cm cable
	2	Antenna	ANT-WDCMA-ASM-1.5	Omni 1 dBi rubber SMA antenna
	3	Module	UC-8481 HSPA cellular accessory package	PH8, cellular module
GPS	1	Cable	A-CRF-CTPSF-R2-50	TNC to SMA (female) adapter with 50 cm cable
	2	Antenna	ANT-GPS-OSM-05-3M	26 dBi, 1572 MHz, L1 band SMA antenna

RNAS-1200 Series

Award-winning Product

TAIWAN EXCELLENCE 2014

Network-attached storage with 2 M12 gigabit PoE+ LAN ports and -40 to 70°C temperature tolerance

- 2 gigabit Ethernet ports for network redundancy
- 2 100 GB disks pre-installed (RNAS-1211-T model only)
- Essential compliance with EN 50155*
- IEC 61373 certified for shock and vibration resistance
- JBOD, BIG, RAID 0, and RAID 1 functions available
- IHS (Intelligent Heating Solution) technology for reliable operation
- Data XPro for data protection in harsh environments
- Fast synchronization in RAID 1

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

EN 50155

Overview

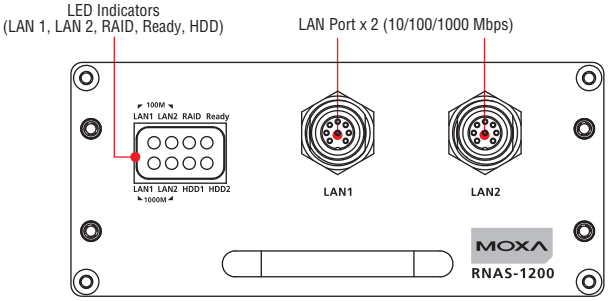
Moxa's RNAS-1200 network-attached storage (NAS) units provide high performance, high reliability, and high capacity data storage in harsh industrial environments. All RNAS-1200 devices are housed in a fanless, thermally efficient, dust and water-protected IP54-rated chassis. This sealed enclosure eliminates internal fans as a point of critical system failure, and protects the internal components from dust and water splashes. RNAS-1200 devices are compliant with essential sections of EN 50155, covering operating temperature, power input voltage, surge, ESD, and vibration, as well as conformal coating and power insulation, making them suitable for a variety of industrial applications.

RNAS-1200 devices also come with Moxa's Intelligent Heating Solution™ (IHS) and Data XPro™ technologies. IHS automatically heats the system to ensure reliable operation even in extremely low temperatures, while the Data XPro™ utility provides intelligent data and drive protections against extreme heat and vibration. In addition, the series' remarkably fast array synchronizations make the full data and hardware redundancies of RAID 1 a feasible alternative for industrial applications, while the two gigabit PoE+ network interfaces provide not only network redundancy, but also a highly efficient, fully redundant power supply over the same set of wires.

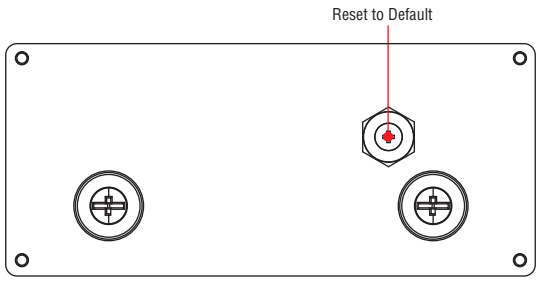
The RNAS-1200 Series combines simple configuration and multiple data and hardware redundancies in a compact, durable, fanless chassis ideal for industrial environments where extreme temperatures and vibration are a concern. The RNAS-1200 NAS devices are your best choice for industrial-strength data storage for rolling stock video surveillance or remote site data storage applications.

Appearance

Front View

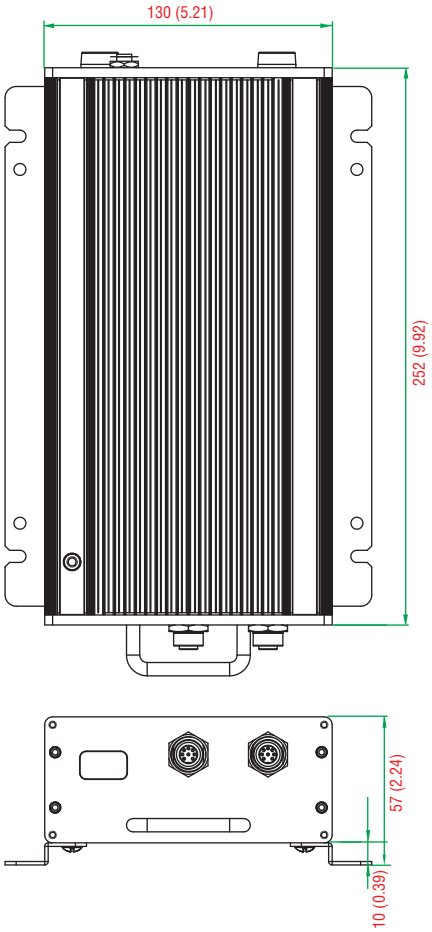


Rear View



Dimensions

Unit: mm (inch)



Hardware Specifications

Computer
CPU: Onboard Marvell 1.0 GHz 88F6281
DRAM: 512 MB DDRII
Flash Memory: Onboard 2 GB USB DOM to store OS

Storage
RNAS-1201-T: 2.5-inch HDD bay x 2, reserved for storage expansion
RNAS-1211-T: 100 GB HDD x 2 pre-installed

Ethernet Interface
LAN: Auto-sensing 10/100/1000 Mbps ports (M12) x 2

IHS Control
IHS Function Control: Temperature reading, power output control for heating function

LEDs
System: RAID, Ready, HDD1, HDD2
LAN: 100M/Link x 2, 1000M/Link x 2

Physical Characteristics
Housing: Aluminum
Weight:
RNAS-1201-T: 1.98 kg (4.4 lb)
RNAS-1211-T: 2 kg (4.44 lb)
Dimensions: 252 x 130 x 57 mm (9.92 x 5.12 x 2.24 in)
Mounting: Wall
IP Rating: IP 54

Environmental Limits
Operating Temperature: -40 to 70°C (-40 to 158°F)
Storage Temperature: -40 to 85°C (-40 to 176°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: EN 50155 standard
Anti-Shock: EN 50155 standard
Conformal Coating: Available on request

Power Requirements
Input: PoE (IEEE 802.3af), or PoE+ (IEEE 802.3at)
Note: If the RNAS-1200 is connected to a PoE switch and T1 mode has been configured, the RNAS-1200 should only be booted up when the ambient temperature is above 0°C.

Standards and Certifications
Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: (80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Green Product: RoHS, CRoHS, WEEE
Rail Traffic: EN 50155 (essential compliance*), EN 50121-3-2, IEC 61373
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

MTBF (mean time between failures)

Time:
RNAS-1211: 486,185 hrs
RNAS-1201: 503,159 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

Warranty Period: 5 years (storage drive not included)
Details: See www.moxa.com/warranty
Note: These hardware specifications describe the NAS unit itself, but not its recommended accessories. In particular, the wide temperature specification does not apply to accessories such as power adapters and cables.

Software Specifications

Operating System

System Platform: Linux 2.6 pre-installed

Network

IP Settings: Fixed IP, DHCP
Redundancy: Port trunking / NIC teaming

System Management

Firmware Upgrade: Can be run via web interface
System Bootup: Can be observed by LED indicators for system status
HDD Failure Status: Can be observed by LED indicators

Disk Management

JBOD: Two hard disks can work independently
Spanning Big: Two hard disks can be merged as spanning big mode
RAID 0: Two hard disks can be merged and work in RAID 0 mode
RAID 1: Two hard disks can be merged and work in RAID 1 mode
HDD Recovery: Support automatic or manual data recovery when new had disk has been inserted

Data Protection

Vibration Protection: Storage buffer available for strong vibration status
Temperature Protection: Storage buffer available for low/high temperature environment
Fast Sync.: Fast synchronization in RAID 1 mode

SNMP Management

System: Standard MIB-II (RFC 1213), plus additional Moxa features that include: NTP, time zone, and time display management; channel bonding and IP configuration; management of SSH, FTP, and DNS; and configuration of SNMP agents and traps.

Ordering Information

Available Models

RNAS-1201-T: Network-attached storage with 2 M12 PoE+ gigabit LAN ports and -40 to 70°C temperature tolerance (operating)
RNAS-1211-T: Network-attached storage with 2 M12 PoE+ gigabit LAN ports, 2 pre-installed 100 GB hard disks, and -40 to 70°C temperature tolerance (operating)
RNAS-1201-CT-T: Network-attached storage with 2 M12 PoE+ gigabit LAN ports and -40 to 70°C temperature tolerance (operating), conformal coating
RNAS-1211-CT-T: Network-attached storage with 2 M12 PoE+ gigabit LAN ports, 2 pre-installed 100 GB hard disks, and -40 to 70°C temperature tolerance (operating), conformal coating

Package Checklist

- 1 RNAS-1200 storage appliance
- Wall-mounting kit
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

Optional Accessories

Ethernet	Item	Type	Model Name	Description
	1	Cable	CBL-M12MM8PRJ45-BK-100-IP67	1-meter A-coded M12-to-RJ45 Cat-5E UTP gigabit Ethernet cable, 8-pin male M12 connector, rated IP67
	2	Connectors	M12A-8PMM-IP67	Field-installation A-coded screw-in gigabit Ethernet connector, 8-pin male M12 connector, rated IP67
Mechanical Parts				
	1	Mounting Kit	RNAS Wall-Mounting Assembly with a Lock	Mounting frame with a lock, screws, 2 faceplate brackets, 2 rails
	2	Rail	RNAS Slide Rail	2 extra rails for the RNAS-1200

Mission-Critical Computers

Product Selection Guide

Mission-Critical Computers 23-2

Mission-Critical Computers

MC-7200 Series: x86 fanless, wide temperature industrial computer with 3rd Generation Intel® Core™ processor 23-3

MC-7130-MP: Optimized, highly secure marine platform with diverse interface connectivity 23-6

MC-5000 Series: Fanless ECDIS bridge computers 23-9

MC-1100 Series: Quad-core fanless DIN-rail automation computer 23-13

Mission-Critical Computers

	MC-7200-MP Series	MC-7200-DC-CP Series	MC-7130-MP	MC-5150-DC-CP Series	MC-5150-AC/DC Series	MC-5157-AC/DC Series	MC-1100 Series
Computer							
CPU	Intel® Core™ i7-3555LE 2.5 GHz, Intel® Core™ i3-3120ME 2.4 GHz, Intel® Celeron® 1047UE 1.4 GHz	Intel® Core™ i7-3555LE 2.5 GHz, Intel® Core™ i3-3120ME 2.4 GHz, Intel® Celeron® 1047UE 1.4 GHz	Intel® Core™ i3-3120ME 2.4 GHz	Intel® Core™ i5-520E 2.4 GHz	Intel® Core™ i5-520E 2.4 GHz	Intel® Core™ i5-520E 2.4 GHz	Intel® Atom™ E3845 (Quad Core, 1.91 GHz), Intel® Atom™ E3826 (Dual Core, 1.46 GHz)
Supported OSs	W7E, 32/64-bit W7P, 32/64-bit	W7E, 32/64-bit W7P, 32/64-bit	W7E, 32/64-bit W7P, 32/64-bit	W7E, 32/64-bit W7P, 32/64-bit	W7E, 32/64-bit W7P, 32/64-bit	W7E, 32/64-bit W7P, 32/64-bit	W7E, 32/64-bit
OS Pre-installed	–	–	–	–	–	–	–
System Chipset	Intel® QM77	Intel® QM77	Intel® QM77	Intel® QM57	Intel® QM57	Intel® QM57	–
System Memory Slots	2 SO-DIMM slots, 16 GB capacity	2 SO-DIMM slots, 16 GB capacity	2 SO-DIMM slots, 16 GB capacity	2 SO-DIMM slots, 8 GB capacity	2 SO-DIMM slots, 8 GB capacity	2 SO-DIMM slots, 8 GB capacity	1 SO-DIMM slot, 8 GB capacity
System Memory Pre-installed	4 GB, in 1 slot	4 GB, in 1 slot	4 GB, in 1 slot	2 GB, in 1 slot	2 GB, in 1 slot	2 GB, in 1 slot	2 GB, in 1 slot
Internal Storage Slots	2.5-inch SATA x 2	2.5-inch SATA x 2	2.5-inch SATA x 2	2.5-inch SATA x 1	2.5-inch SATA x 1	2.5-inch SATA x 1	CFast x 1 SD 3.0 (SDHC/SDXC) x 1
External Storage Slots	2.5-inch SATA x 1	2.5-inch SATA x 1	2.5-inch SATA x 1	2.5-inch SATA x 1	2.5-inch SATA x 1	2.5-inch SATA x 1	–
Storage Pre-installed	–	–	–	64 GB MLC SSD	–	–	–
I/O Interface							
USB	USB 2.0 x 6, Type A USB 3.0 x 2, Type A	USB 2.0 x 6, Type A	USB 2.0 x 6, Type A USB 3.0 x 2, Type A	USB 2.0 x 6, Type A	USB 2.0 x 6, Type A	USB 2.0 x 6, Type A	USB 2.0 x 2, Type A
Audio	Line in x 1, Line out x 1, Mic input x 1	Line in x 1, Line out x 1, Mic input x 1	Line in x 1, Line out x 1, Mic input x 1	Line in x 1, Line out x 1	Line in x 1, Line out x 1	Line in x 1, Line out x 1	–
KB/MS	2 PS/2 interfaces	2 PS/2 interfaces	2 PS/2 interfaces	2 PS/2 interfaces	2 PS/2 interfaces	2 PS/2 interfaces	–
PCI Slots	2	–	2	–	–	2	–
PCIe Slots	1, PCIE x16	–	1, PCIE x16	–	–	–	–
Display Interface	1 VGA output, DB15 female 2 DVI-D			1 VGA output, DB15 female 1 DVI-I			1 VGA output, DB15 female 1 display port
LAN Ports	10/100/1000 Mbps (RJ45) x 4			10/100/1000 Mbps (RJ45) x 2			10/100/1000 Mbps (RJ45) x 4
Serial Ports	RS-232/422/485 (DB9) x 2 RS-232 (DB9) x 2						RS-232/422/485 (DB9) x 2
NMEA Ports	NMEA 0183 x 8 (IEC-61162)	–	NMEA 0183 x 8 (IEC-61162)	–	NMEA 0183 x 8 (IEC-61162)	NMEA 0183 x 8 (IEC-61162)	–
Digital Iuput/Output	8DI/8DO	–	8DI/8DO	–	–	–	4DI/4DO
LPT ports	DB25 x 1			–	DB25 x 1		–
Physical Characteristics							
Housing	Aluminum sheet metal						
Weight	8 kg (17.78 lb)	3.75 kg (8.33 lb)	8 kg (17.8 lb)	3.85 kg (8.56 lb)	6.85 kg (15.22 lb)	8 kg (17.78 lb)	1.21 kg (2.69 lb), or 0.97 kg (2.16 lb)
Dimensions	287 x 250 x 70 mm (11.30 x 9.84 x 2.76 in)	150 x 160 x 80 mm (5.91 x 6.30 x 3.15 in)	322 x 300 x 150 mm (12.68 x 11.81 x 5.91 in)	287 x 250 x 70 mm (11.30 x 9.84 x 2.76 in)	287 x 250 x 135 mm (11.30 x 9.84 x 5.31 in)	320 x 300 x 171 mm (12.60 x 11.81 x 6.73 in)	132 x 120 x 92 mm (5.20 x 4.72 x 3.62 in)
Mounting	Wall		Wall	Wall			Wall, DIN rail
Thermal Solution	Fanless		Intelligent fan	Fanless			Fanless
Environmental Limits							
Operating Temperature	-40 to 70°C (-40 to 131°F)		-15 to 55°C (5 to 131°F)				-40 to 70°C (-40 to 131°F)
Storage Temperature	-50 to 80°C (-40 to 176°F)		-20 to 60°C (-4 to 131°F)				-45 to 75°C (-49 to 103°F)
Ambient Relative Humidity	5 to 95% (non-condensing)		5 to 95% (non-condensing)				5 to 95% (non-condensing)
Anti-Vibration	DNV 2.4 standard						
Power Requirements							
Input Voltage	24 VDC (18 to 30 VDC); 100 to 240 VAC						12/24 VDC (9 to 36 VDC)
Power Consumption	Less than 100 W, 2.5 A @ 24 VDC						Less than 30 W
Standards and Certifications							
Marine	DNV 2.4, IEC 60945 4th., IACS-E10						DNV 2.4, IEC 60945 4th
Green Product	RoHS, cRoHS, WEEE						
Warranty							
Warranty Period	3 years						
Details	See www.moxa.com/warranty						
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MC-7200 Series

x86 fanless, wide temperature industrial computer with 3rd Generation Intel® Core™ processor

- High performance platform with 3rd gen. Intel® Core™ i7 3555LE processor
- Rugged, fanless design optimized for harsh environments
- Scalable, modularized interfaces for marine solutions
- Four Ethernet LAN ports + SNMP delivers strong network availability and manageability
- High graphics performance suppported across up to 3 independent displays

Overview

The MC-7200 marine computers are powered by the latest 3rd generation Intel® Core™ i7 3555LE processor and provide high-performance graphics alongside a full range of I/O connectivity that includes eight NMEA 0183 terminals, four serial ports, four gigabit Ethernet ports, six USB 2.0 ports, and two SuperSpeed USB 3.0 ports. The MC-7200 series is designed to deliver unrivalled PC performance for a new generation of automated marine solutions.

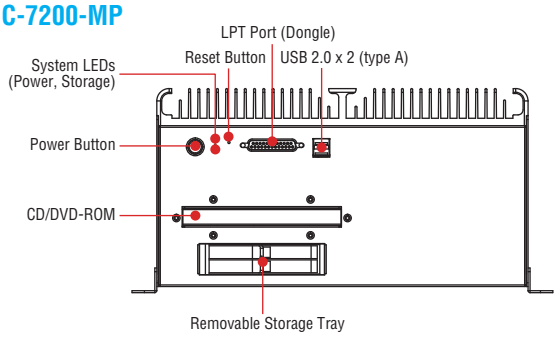
Designed for reliability, durability, and extensive computational and graphics performance, the marine-grade MC-7200 computers feature a rugged shell and vibration tolerance up to 1G. This computer's compact size and low power consumption return a low-heat profile that simplifies bridge and cabinet installations. To facilitate customization and expansion, MC-7200 series computers come with a single PCIe (x16) slot and two universal PCI slots, allowing users to easily install a wide variety of peripherals like radar, graphics, and PROFIBUS cards.

The MC-7200 series is optimized for use with the Windows XP Embedded, XP Professional, or Windows 7 operating systems, allowing users to choose the development environment most suitable for their application.

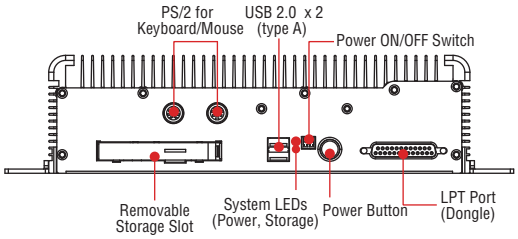
Appearance

Front View

MC-7200-MP

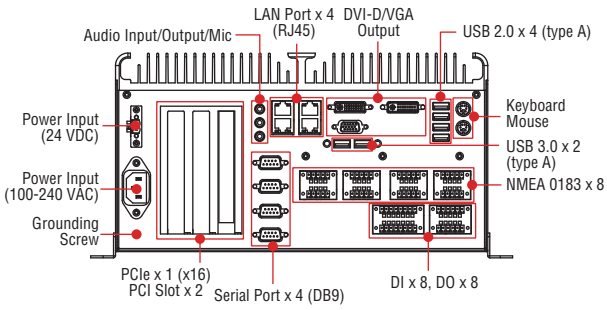


MC-7200-DC-CP

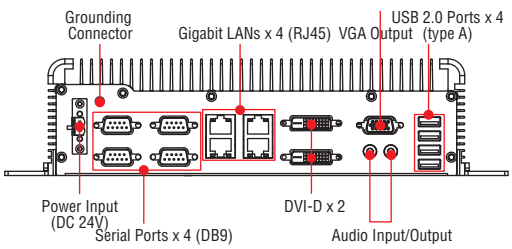


Rear View

MC-7200-MP



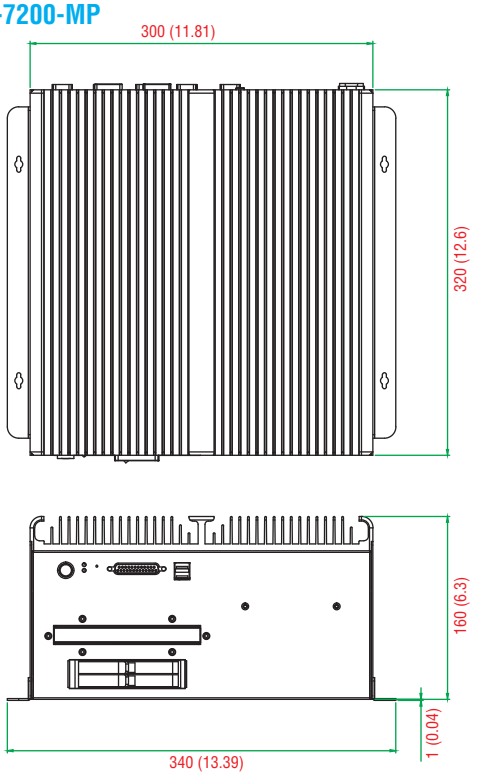
MC-7200-DC-CP



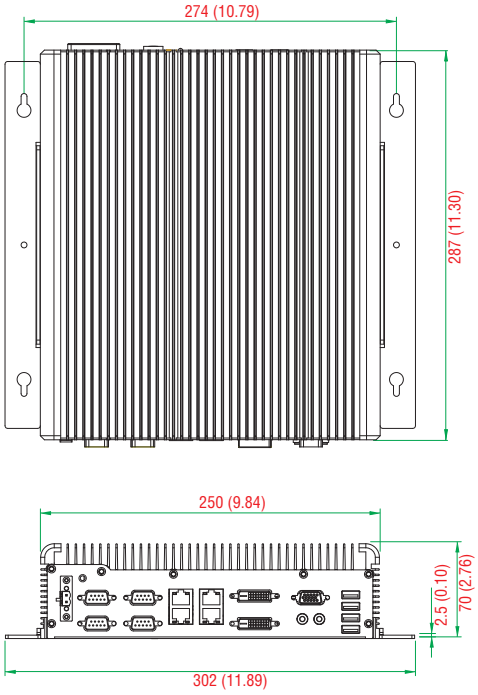
Dimensions

Unit: mm (inch)

MC-7200-MP



MC-7200-DC-CP



Specifications

Computer

CPU: Intel® Core™ i7-3555LE (BGA CPU package), quad-core, 8-threaded, 64-bit 2.1 GHz processor
OS: Windows 7, Windows XP SP3, Windows XP Embedded (must be installed by the user)
System Chipset: Intel® QM77 Express Chipset
System Memory: 16 GB capacity, 4 GB pre-installed: 1 slot for 4 GB DDR3 204-pin SO-DIMM SDRAM
USB:
MP model:
• USB 2.0 hosts x 6, Type A
• USB 3.0 hosts x 2, Type A
DC-CP model: USB 2.0 hosts x 6, Type A
Storage:
• 2 SATA 6 Gbps ports for SSD/HDD
• 2 SATA 3 Gbps ports for SSD/HDD (MC-7270-MP only)

Other Peripherals

Audio: Line in, line out, microphone; 3.5 mm mini-jack
KB/MS: 2 PS/2 interfaces supporting standard PS/2 keyboard and mouse
PCI Slots: 2 (MP model)
LPT Ports: 1
PCIe x16 Slots: 1 (MP model)

Display

Display Interface:
• 1 VGA output: 15-pin D-Sub connector (female), max. resolution 2048 x 1536, 32-bit color at 75 Hz
• 2 DVI-D outputs: 29-pin DVI-D connectors (female), max. resolution 1920 x 1200, 32-bit color at 60 Hz
Graphics Controller: Onboard Intel® HD 4000 graphics

Ethernet Interface

LAN: Auto-sensing 10/100/1000 Mbps ports (RJ45) x 4
Magnetic Isolation Protection: 1.5 kV built in

Serial Interface

Serial Standards:
• 2 software-selectable RS-232/422/485 ports (DB9 male)
• 2 RS-232 ports (DB9 male)
• 8 NMEA 0183 v2 terminals (3.81 mm Euroblock connector) (NMEA 2000 available on request)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 230.4 kbps

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

NMEA Interface

Note: The NMEA interface specs only apply to the MC-7270-MP.
Interfaces:
8 NMEA 0183 v2 terminals (NMEA 2000 available on request)
Base Serial Standard:
• NMEA 0183: RS-422
• NMEA 2000: CAN bus (available on request)
Optical Isolation Protection: 3 kV
Voltage Differential: -15 V to +15 V

Baudrate: 4800 bps
Data Bits: 8
Stop Bits: 1, 1.5, 2
Parity: None
Handshake: None

Digital Input

Input Channels: 8 dry channels, with 4 grounds
Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open
Connector Type: 2 screw-fastened 6-pin 3.81 mm Euroblock terminals
Isolation: ESD protection to DNV specifications

Relay Output

Note: The relay output specs only apply to the MC-7270-MP.
Type: Form A (N.O.) power relay
Output Channels: 8
Contact Rating: 2 A, 30 VDC / 0.5 A, 125 VAC under resistor load
Initial Insulation Resistance: 1000 mega-ohms (min.) @ 500 VDC
Mechanical Endurance: 100,000 operations @ 2 A, 30 VDC resistive load
Electrical Endurance: 100,000,000 operations
Contact Resistance: 50 milli-ohms (max.) @ 6 V, 0.1 A
Connector Type: 2 screw-fastened 8-pin 3.81 mm Euroblock terminals
Isolation: Relay isolation; ESD protection to DNV specifications

LEDs

System: Storage, Power
LAN: 100M/Link x 4, 1000M/Link x 4 (on connector)

Physical Characteristics

Housing: Aluminum, sheet metal
Weight:
• DC-CP Model: 3.75 kg (8.33 lb)
• MP Model: 8 kg (17.78 lb)
Dimensions:
• DC-CP Model: 150 x 160 x 80 mm (5.91 x 6.30 x 3.15 in)
• MP Model: 287 x 250 x 70 mm (11.30 x 9.84 x 2.76 in)
Mounting: Wall (mounting kit must be purchased separately)

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 131°F)
Storage Temperature: -50 to 80°C (-40 to 176°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-vibration:
• 0.7 g @ DNV 2.4 (Class A), sine wave, 2-100 Hz, 1 Oct./min., 1.5 hr per axis
• 1 Grms @ DNV 2.4, random wave, 3-100 Hz, 2.5 hr per axis
• 2.1 g @ DNV 2.4 (Class C), sine wave, 2-50 Hz, 1 Oct./min., 1.5 hr per axis

Power Requirements

Input Voltage:
• DC: 24 VDC (with tolerance from 18 to 30 VDC, 2-pin terminal block)
• AC: 100 to 240 VAC (MC-7270-MP only)
Power Consumption: Less than 100 W, 2.5 A @ 24 VDC

Standards and Certifications

Safety: UL 60950-1, DNV 2.4, IEC 60945 (4th), IACS-E10, CCC (GB4943, GB9254, GB17625.1)
EMC: EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class B
Marine: IEC 60945 4th (Pending), IACS-E10 (Pending)
Green Product: RoHS, cRoHS, WEEE

MTBF (mean time between failures)

Time:
• MC-7230-DC-CP-T/MC-7270-DC-CP-T: 619,557 hrs
• MC-7230-MP-T: 219,195 hrs
• MC-7270-MP-T: 219,214 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

Warranty Period: 3 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models

MC-7270-MP-T: x86-based industrial computer with 3rd gen. Intel® Core™ i7 3555LE processor, 4 serial ports, 8 NMEA 0183 ports, 4 gigabit Ethernet ports, 8 DIs, 8 DOs, 6 USB 2.0 ports, 2 USB 3.0 ports, 2 PCI slots, 1 PCIe x16 slot, VGA/DVI, and AC/DC power inputs
MC-7230-MP-T: x86-based industrial computer with 3rd gen. Intel® Core™ i3 3120ME processor, 4 serial ports, 8 NMEA 0183 ports, 4 gigabit Ethernet ports, 8 DIs, 8 DOs, 6 USB 2.0 ports, 2 USB 3.0 ports, 2 PCI slots, 1 PCIe x16 slot, VGA/DVI, and AC/DC power inputs
MC-7210-MP-T: x86-based industrial computer with 3rd gen. Intel® Celeron 1047 processor, 4 serial ports, 8 NMEA 0183 ports, 4 gigabit Ethernet ports, 8 DIs, 8 DOs, 6 USB 2.0 ports, 2 USB 3.0 ports, 2 PCI slots, 1 PCIe x16 slot, VGA/DVI, and AC/DC power inputs
MC-7270-DC-CP-T: x86-based industrial computer with Intel® Core™ i7 3555LE processor, fanless, wide temperature, 4 serial ports, 4 gigabit Ethernet ports, 6 USB hosts, VGA/DVI, and DC power input
MC-7230-DC-CP-T: x86-based industrial computer with Intel® Core™ i3 3120ME processor, fanless, wide temperature, 4 serial ports, 4 gigabit Ethernet ports, 6 USB hosts, VGA/DVI, and DC power input
MC-7210-DC-CP-T: x86-based industrial computer with Intel® Celeron 1047UE processor, fanless, wide temperature, 4 serial ports, 4 gigabit Ethernet ports, 6 USB hosts, VGA/DVI, and DC power input

Package Checklist (MC-7200-MP-T Series)

- 1 MC-7200-MP-T marine computer
- 2 removable storage protection keys
- Wall mounting kit, with 8 screws
- 1 2-pin terminal block for DC power input
- 1 2-pin terminal block for power ON/OFF switch
- 2 6-pin digital input terminal blocks
- 2 8-pin digital output terminal blocks
- 8 5-pin terminal blocks for NMEA 0183 ports
- Documentation and driver CD
- Quick installation guide
- Warranty card

Package Checklist (MC-7200-DC-CP-T Series)

- 1 MC-7200-DC-CP-T computer
- 1 2-pin terminal block for DC power input
- 1 2-pin terminal block for power ON/OFF switch
- Hard disk installation kit
- Documentation and driver CD
- Quick installation guide (printed)
- Warranty card

MC-7130-MP

Optimized, highly secure marine platform with diverse interface connectivity

- High-performance computing platform with 3rd gen Intel® Core™ i3 3120ME processor
- Optimized solution with modularized NMEA interfaces
- DNV- and ABS-certified
- Trusted Platform Module provides data and hardware security integrated at the hardware level
- High graphics performance supported across up to 3 independent displays

Overview

The MC-7130-MP marine computer is powered by the latest 3rd generation Intel® Core™ i3 3120ME processor. Optimized for ECDIS, these computers can serve in nearly any bridge role thanks to their comprehensive range of I/O and communications interfaces: eight NMEA 0183 terminals, four serial ports, four gigabit Ethernet ports, six USB 2.0 and three SuperSpeed USB 3.0 ports. The MC-7130-MP is designed to give unrivalled PC performance for a new level of flexibility and control for marine applications.

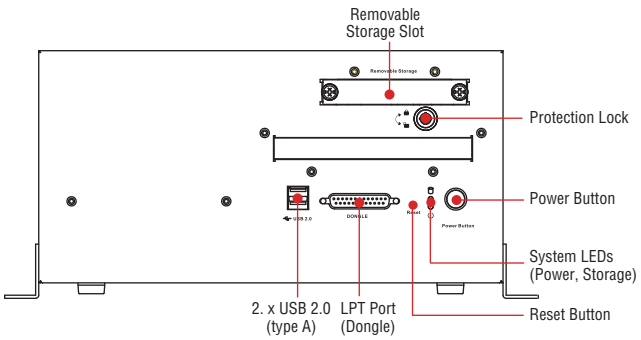
Designed with the highest quality and durability in mind, the marine-grade MC-7130-MP computer features a rugged chassis and vibration tolerance up to 1G, together providing a highly reliable platform that can easily tolerate the harsh environmental challenges of marine environments. Additionally, the MC-7130-MP's compact size and low power consumption return a low heat profile that increases MTBF while simplifying integration into existing bridge systems or newly designed marine solutions.

Finally, the MC-7130-MP also offers convenient connectivity expansions via a single PCIe (x16) slot and two universal PCI slots, allowing users to install a variety of peripheral extensions for radar, PROFIBUS, VGA graphics, and more, allowing for direct consolidation of all input sources at a single hub.

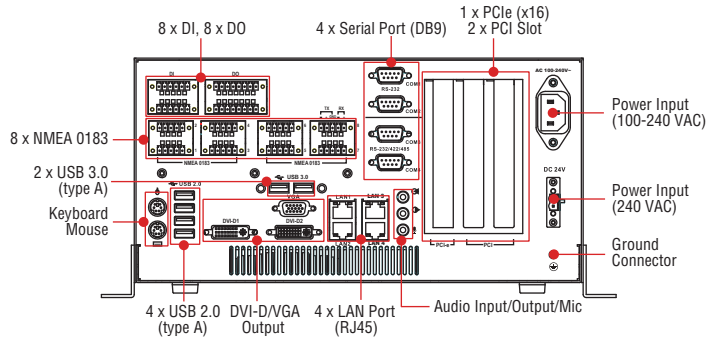
The MC-7130-MP platform is optimized for use with the Windows XP Embedded, XP Professional, or Windows 7 operating systems, allowing users to choose the development environment most suitable for the application's needs.

Appearance

Front View

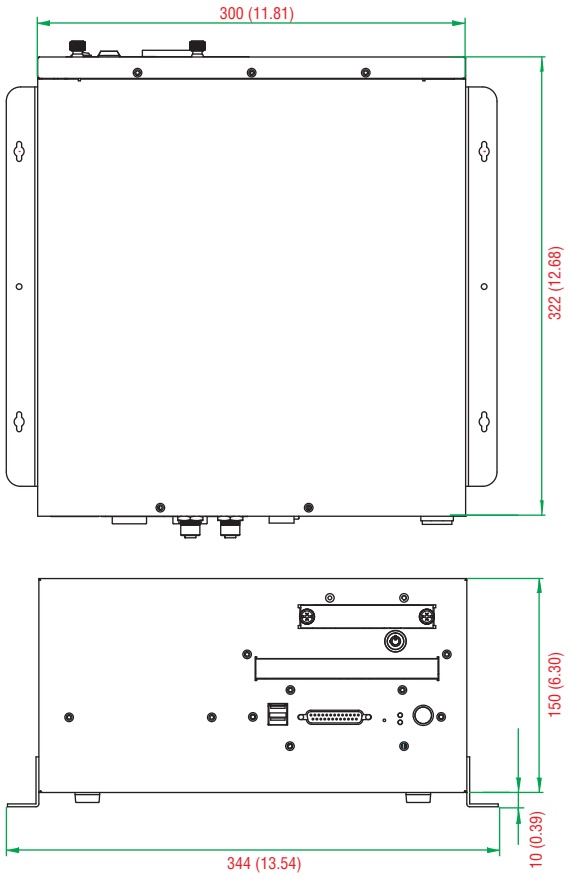


Rear View



Dimensions

Unit: mm (inch)



Specifications

Computer

CPU: Intel® Core™ i3-3120ME (BGA CPU package), dual-core threaded 64-bit 2.4-GHz processor
OS: Windows 7, Windows XP SP3, Windows XP Embedded (must be installed by the user)
System Chipset: Intel® QM77 Express Chipset
System Memory: 16 GB capacity, 4 GB pre-installed: 2 slots of 8 GB DDR3-1066 204 pin SO-DIMM SDRAM
USB:
• USB 2.0 hosts x 6, Type A
• USB 3.0 hosts x 2, Type A
Storage:
• 2 SATA 6 Gbps ports for SSD/HDD
• 2 SATA 3 Gbps ports for SSD/HDD

Other Peripherals

Audio: Line in x 1, Line out x 1, Mic in x 1
KB/MS: 2 PS/2 interfaces supporting standard PS/2 keyboard and mouse
PCI Slots: 2
LPT Ports: 1
PCIe x16 Slots: 1

Display

Display Interface:
• VGA Interface x 1: 15-pin D-Sub connector (female), with resolution up to 1920 x 1080
• DVI-D Interface x 2: 29-pin DVI-D connectors (female), with resolution up to 1920 x 1080, 60 Hz (with reduced blanking)
Graphics Controller: Onboard Intel® HD 4000 graphics

Ethernet Interface
LAN: Auto-sensing 10/100/1000 Mbps ports (RJ45) x 4
Magnetic Isolation Protection: 1.5 kV built in

Serial Interface
Serial Standards:
• 2 RS-232/422/485 ports, software-selectable (DB9 male)
• 2 RS-232 ports (DB9)
• 8 NMEA 0183 terminals (NMEA 2000 available on request)

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 230.4 kbps

Serial Signals
RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

NMEA Interface
Serial Standards: NMEA 0183v2 (NMEA 2000 available on request)
Base Serial Standard:
• NMEA 0183: RS-422
• NMEA 2000: CAN bus (available on request)
Optical Isolation Protection: 3 kV
Voltage Differential: -15 V to +15 V
Baudrate: 4800 bps
Data Bits: 8
Stop Bits: 1, 1.5, 2
Parity: None
Handshake: None

Digital Input
Input Channels: 8 dry channels, with 4 grounds
Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open
Connector Type: 6-pin Phoenix-compatible 3.81-mm screw terminal blocks x 2
Isolation: ESD protection to DNV specifications

Relay Output
Type: Form A (N.O.) power relay
Output Channels: 8
Contact Rating: 2 A, 30 VDC / 0.5 A, 125 VAC under resistor load
Initial Insulation Resistance: 1000 mega-ohms (min.) @ 500 VDC
Mechanical Endurance: 100,000 operations @ 2 A, 30 VDC resistive load
Electrical Endurance: 100,000,000 operations
Contact Resistance: Max. 50 mega-ohms @ 6 V, 0.1 A
Connector Type: 2 Euroblock 8-pin 3.81 mm screw terminals
Isolation: Relay isolation; ESD protection to DNV specifications

LEDs
System: Storage, Power
LAN: 2 LEDs on each port: 100 Mbps (left) / 1000 Mbps (right)

Physical Characteristics
Housing: Aluminum, sheet metal
Weight: 8 kg (17.8 lb)
Dimensions: 322 x 300 x 150 mm (12.68 x 11.81 x 5.91 in)
Mounting: Wall
System Cooling: Moxa intelligent fan

Environmental Limits
Operating Temperature: -15 to 55°C (5 to 131°F)
Storage Temperature: -20 to 60°C (-4 to 131°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-vibration:
• 0.7 g @ DNV 2.4 (Class A), sine wave, 2-100 Hz, 1 Oct./min., 1.5 hr per axis
• 1 Grms @ DNV 2.4, random wave, 3-100 Hz, 2.5 hr per axis
• 2.1 g @ DNV 2.4 (Class C), sine wave, 2-50 Hz, 1 Oct./min., 1.5 hr per axis

Power Requirements
Input Voltage:
• DC: 24 VDC (with tolerance from 18 to 30 VDC, 2-pin terminal block)
• AC: 100 to 240 VAC
Power Consumption: Less than 100 W, 2.5 A @ 24 VDC

Standards and Certifications
Safety: UL 60950-1, DNV 2.4, IEC 60945 (4th), IACS E10
EMC: EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class B
Marine: IEC 60945 4th, IACS E10
Green Product: RoHS, cRoHS, WEEE

MTBF (mean time between failures)
Time: 114,305 hrs
Standard: MIL-HDBK-217 FN2

Warranty
Warranty Period: 3 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models
MC-7130-MP: x86-based ECDIS computer with 3rd gen. Intel® Core™ i3 CPU processor, 4 serial ports, 8 NMEA 0183 ports, 4 gigabit Ethernet ports, 8 DIs, 8 DOs, 6 USB 2.0 ports, 2 USB 3.0 ports, 2 PCI slots, 1 PCIe x16 slot, VGA/DVI, TPM, and AC/DC power inputs

Optional Accessories (for AC models only, can be purchased separately)
PWC-C13US-3B-183: 10A/125V North American (US) power cord, 183 cm
PWC-C13EU-3B-183: 10A/250V Continental European (EU) power cord, 183 cm
PWC-C13UK-3B-183: 10A/250V United Kingdom (UK) power cord, 183 cm
PWC-C13AU-3B-183: 2.5A/250V Australian (AU) power cord, 183 cm
PWC-C13CN-3B-183: 10A/250V China (CN) power cord, 183 cm

Package Checklist
- MC-7130-MP computer
- 2 removable storage protection keys
- 8 screws for internal and removable drive trays
- Wall-mounting kit
- 6 screws for wall mounting
- 1 terminal block for power input
- 4 terminal blocks for DI/DO channels
- 8 terminal blocks for NMEA 0183 ports
- Documentation and driver CD
- Quick installation guide (printed)
- Warranty card

MC-5000 Series

Award-winning Product
TAIWAN EXCELLENCE 2013

Fanless ECDIS bridge computers with built-in NMEA interfaces and Intel® dual core i5-520E CPU

- High performance Intel® Core™ i5 520E processor, 3 MB L2 cache
- 2 GB of DDR3 memory built in; supports up to 8 GB
- Dual independent displays (DVI-I + VGA)
- 2 gigabit Ethernet ports for network redundancy
- 2 RS-232/422/485 serial ports
- 2 RS-232 ports
- 8 NMEA terminals
- 2 universal PCI slots
- 6 USB 2.0 ports
- 1 internal SATA storage drive slot
- 1 removable SATA storage drive tray
- 1G anti-vibration design for system reliability
- Compact, fanless design
- 24 VDC or 100 to 240 VAC power input models available
- Supports Windows XP Embedded, XP Professional, Windows 7

Overview

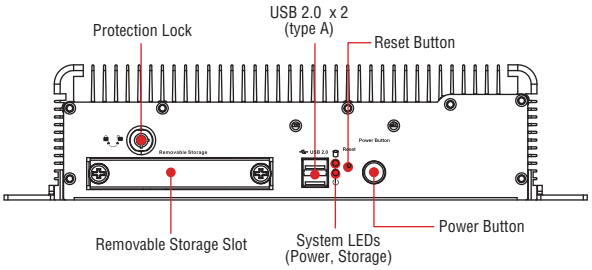
The MC-5000 Series computers feature the Intel® Core™ i5 520E processor and come with four serial ports, two gigabit Ethernet ports, six USB hosts, and eight NMEA terminals. The computers offer high performance and versatile peripherals for marine applications.

Designed with the highest quality and durability in mind, the marine-grade MC-5000 Series computers feature a rugged chassis and are proven against constant vibrations up to 1G, making these computers a most reliable platform even in harsh maritime environments and conditions. In addition, the MC-5150 series' compact size, fanless design, and low power consumption return a low thermal profile that translates into easier installations for any marine solution. 2 universal PCI slots allow users to expand the system using standard peripheral cards for radar, PROFIBUS, or marine-specific interfaces like NMEA.

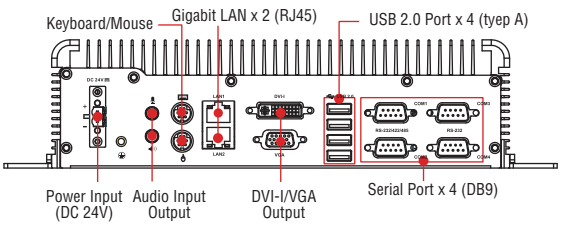
The MC-5000 series is optimized for use with the Windows XP Embedded, XP Professional, or Windows 7 operating systems, allowing users to choose the development environment most suitable for the application's needs.

Appearance

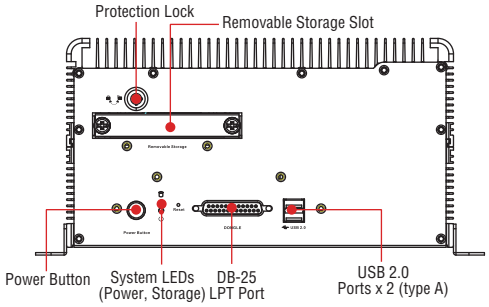
MC-5150-DC-CP Front View



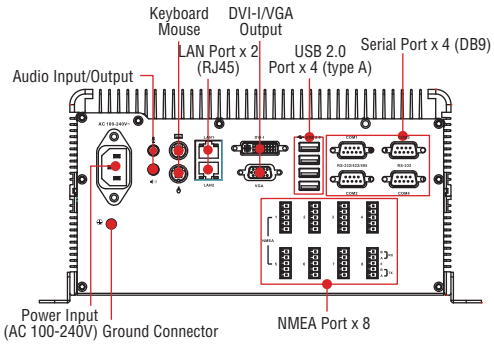
MC-5150-DC-CP Rear View



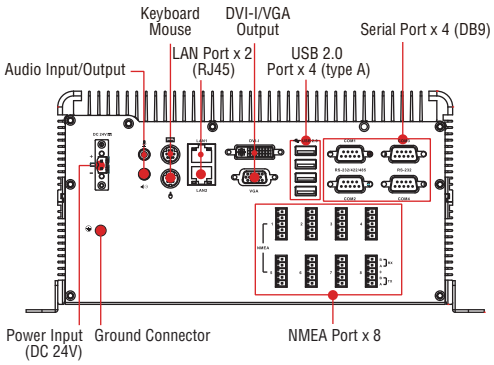
MC-5150-AC/DC Front View



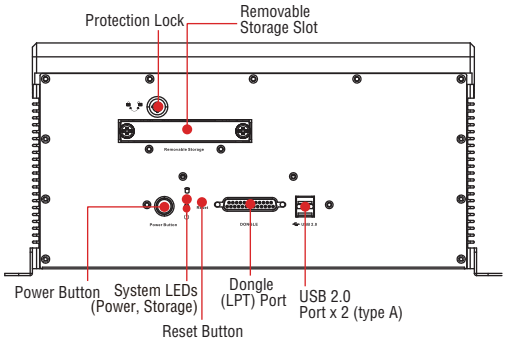
MC-5150-AC Rear View



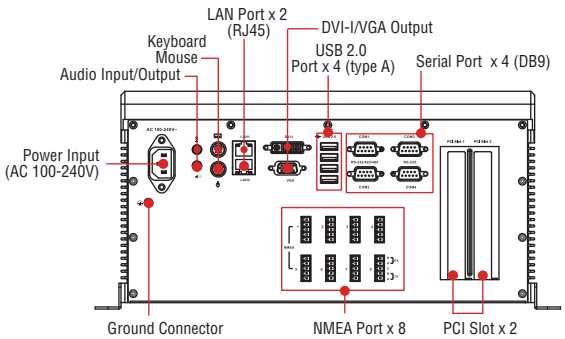
MC-5150-DC Rear View



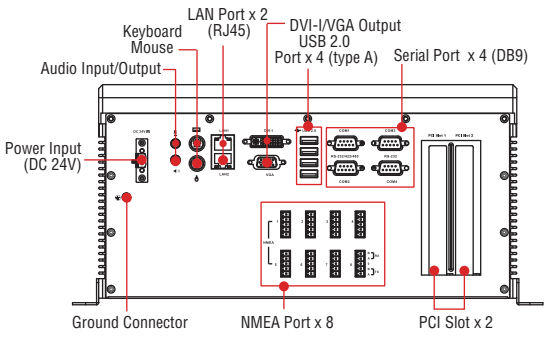
MC-5157-AC/DC Front View



MC-5157-AC Rear View



MC-5157-DC Rear View



Specifications

Computer

CPU: Intel® Core™ i5-520E (BGA CPU package), dual core threaded 64 bit 2.4 GHz processor
OS: Windows 7, Windows XP SP3, Windows XP Embedded (must be installed by the user)
System Chipset: Intel® QM57 Express Chipset
FSB: 1066
System Memory:
- MC-5150-DC-CP: 2 GB capacity, 2 GB pre-installed: 2 slots of 2 GB DDR3 204 pin SO-DIMM SDRAM
- MC-5150-AC/DC: 8 GB capacity, 2 GB pre-installed: 2 slots of 4 GB DDR3 204 pin SO-DIMM SDRAM
- MC-5157-AC/DC: 8 GB capacity, 2 GB pre-installed: 2 slots of 4 GB DDR3 204 pin SO-DIMM SDRAM

USB: USB 2.0 ports x 6, type A
Storage:
- MC-5150-DC-CP: 1 internal SATA storage tray, 1 removable SATA storage tray with 64 GB SSD
- MC-5150-AC/DC: 1 internal SATA storage tray, 1 removable SATA storage drive tray
- MC-5157-AC/DC: 1 internal SATA storage tray, 1 removable SATA storage drive tray

Other Peripherals

Audio: line in / line out, 3.5 mm mini-jack
KB/MS: 2 PS/2 interfaces supporting standard PS/2 keyboard and mouse
PCI Slots: 2 (MC-5157 only)

Display

Display Interface:
- VGA Interface: 15-pin D-Sub connector (female)
- DVI-I Interface: 29-pin DVI-I connector (female)

Graphics Controller: Onboard Intel® HD graphics, 1920 x 1080 max. resolution

Ethernet Interface

LAN: Auto-sensing 10/100/1000 Mbps ports (RJ45) x 2
Magnetic Isolation Protection: 1.5 kV built in

Serial Interface

Serial Standards:
- 2 software-selectable RS-232/422/485 ports, male DB9
- 2 RS-232 ports (DB9)
- 8 NMEA 0183 v2 terminals (3.81 mm Euroblock connector) (MC-5150-AC/DC, MC-5157-AC/DC only)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 230.4 kbps

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

LEDs

System: Storage, Power
LAN: 100M/Link x 2, 1000M/Link x 2 (on connector)

Physical Characteristics

Housing: Aluminum, sheet metal
Weight:
- MC-5150-DC-CP: 3.85 kg (8.56 lb)
- MC-5150-AC/DC: 6.85 kg (15.22 lb)
- MC-5157-AC/DC: 8 kg (17.78 lb)

Dimensions:
- MC-5150-DC-CP: 287 x 250 x 70 mm (11.30 x 9.84 x 2.76 in) without ears
- MC-5150-AC/DC: 287 x 250 x 135 mm (11.30 x 9.84 x 5.31 in) without ears
- MC-5157-AC/DC: 320 x 300 x 171 mm (12.60 x 11.81 x 6.73 in) without ears

Mounting: Wall

Environmental Limits

Operating Temperature: -15 to 55°C (5 to 131°F)
Storage Temperature: -20 to 60°C (-4 to 131°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-vibration:
- 0.7 g @ DNV 2.4 (Class A), sine wave, 2-100 Hz, 1 Oct./min., 1.5 hr per axis
- 1 Grms @ DNV 2.4, random wave, 3-100 Hz, 2.5 hr per axis
- 2.1 g @ DNV 2.4 (Class C), sine wave, 2-50 Hz, 1 Oct./min., 1.5 hr per axis

Power Requirements

Input Voltage:
MC-5150-DC-CP: 24 VDC (with tolerance from 18 to 30 VDC, 2-pin terminal block)
MC-5150-AC/DC:
- DC: 24 VDC (with tolerance from 18 to 30 VDC, 2-pin terminal block)
- AC: 100 to 240 VAC

MC-5157-AC/DC:
- DC: 24 VDC (with tolerance from 18 to 30 VDC, 2-pin terminal block)
- AC: 100 to 240 VAC

Power Consumption: Less than 100 W, 2.5 A @ 24 VDC

Standards and Certifications

Safety: UL 60950-1, DNV 2.4, IEC 60945 (4th) , IACS-E10, CCC (GB4943, GB9254, GB17625.1)
EMC: EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class B
Marine: IEC 60945 4th, IACS-E10
Green Product: RoHS, cRoHS, WEEE

MTBF (mean time between failures)

Time:
- MC-5150 Series: 220,490 hrs
- MC-5157 Series: 152,997 hrs

Standard: Telcordia (Bellcore) Standard TR/SR

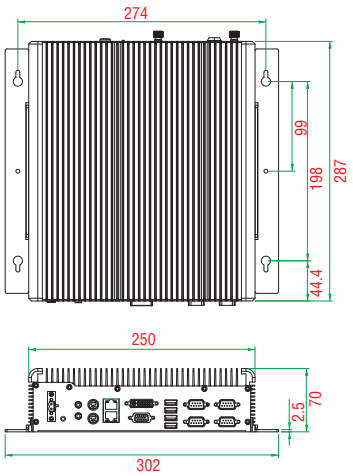
Warranty

Warranty Period: 3 years
Details: See www.moxa.com/warranty

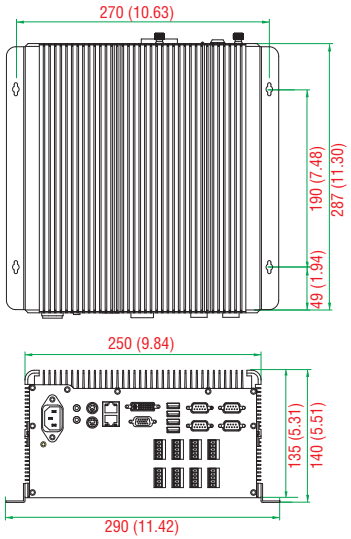
Dimensions

Unit: mm (inch)

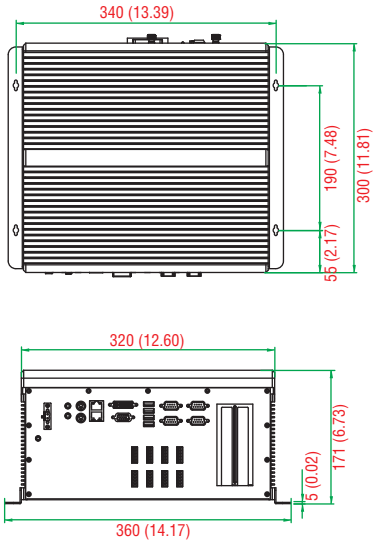
MC-5150-DC-CP



MC-5150-AC/DC



MC-5157-AC/DC



Ordering Information

Available Models

MC-5150-DC-CP: Industrial computer with Intel® Core™ i5 CPU processor, 4 serial ports, 2 gigabit Ethernet ports, 6 USB ports, storage, VGA/DVI, and DC power input
MC-5150-AC: ECDIS computer with Intel® Core™ i5 CPU processor, 4 serial ports, 8 NMEA terminals, 2 gigabit Ethernet ports, 6 USB ports, storage, VGA/DVI, and AC power input
MC-5150-DC: ECDIS computer with Intel® Core™ i5 CPU processor, 4 serial ports, 8 NMEA terminals, 2 gigabit Ethernet ports, 6 USB ports, storage, VGA/DVI, and DC power input
MC-5157-AC: Ship's bridge computer with Intel® Core™ i5 CPU processor, 4 serial ports, 8 NMEA terminals, 2 gigabit Ethernet ports, 6 USB ports, 2 universal PCI slots, storage, VGA/DVI, and AC power input
MC-5157-DC: Ship's bridge computer with Intel® Core™ i5 CPU processor, 4 serial ports, 8 NMEA terminals, 2 gigabit Ethernet ports, 6 USB ports, 2 universal PCI slots, storage, VGA/DVI, and DC power input

Optional Accessories (for AC models only, can be purchased separately)

PWC-C13US-3B-183: 10A/125V North American (US) power cord, 183 cm
PWC-C13EU-3B-183: 10A/250V Continental European (EU) power cord, 183 cm
PWC-C13UK-3B-183: 10A/250V United Kingdom (UK) power cord, 183 cm
PWC-C13AU-3B-183: 2.5A/250V Australian (AU) power cord, 183 cm
PWC-C13CN-3B-183: 10A/250V China (CN) power cord, 183 cm

Package Checklist (MC-5150-DC-CP)

- MC-5150-DC-CP computer
- 2 keys for the locking removable storage trays
- 4 screws for internal drive tray
- Terminal block for power input
- Hard disk installation kit
- Documentation and driver CD
- Quick installation guide (printed)
- Warranty card

Package Checklist (MC-5150-AC/DC)

- MC-5150-AC/DC computer
- 2 keys for the locking removable storage trays
- 4 screws for internal drive tray
- Terminal block for power input
- Hard disk installation kit
- Documentation and driver CD
- Quick installation guide (printed)
- Warranty card

Package Checklist (MC-5157-AC/DC)

- MC-5157-AC/DC computer
- 2 keys for the locking removable storage trays
- 8 screws for internal and removable drive trays
- Terminal block for power input (DC model only)
- 8 terminal blocks for NMEA interfaces
- Documentation and driver CD
- Quick installation guide (printed)

MC-1100 Series

Preliminary

Quad-core fanless DIN-rail automation computer

- Intel Atom E3800 series processor
- Dual-storage (SD and CFast slots)
- Dual-independent displays (VGA + display port)
- Variety of interfaces: 2 serial ports, 4 Giga LAN, 4 DIs, 4 DOs, 2 USB2.0
- Mini-PCIe sockets for WiFi, 3G, LTE, GPS
- 9 to 36 VDC, wide range isolated power
- -40 to 70°C system operating temperature range
- Moxa SmartRecovery utility to recover system from boot failure (W7E only)
- Marine-grade and Zone 2 compliance

Overview

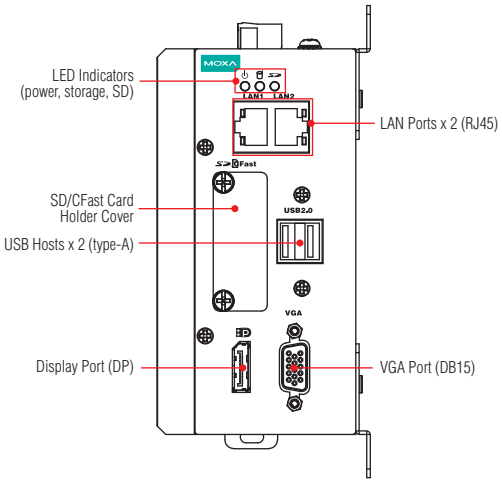
The Moxa MC-1100 series DIN-rail, fanless, x86 embedded computers are based on the Intel® Atom™ E3800 series processor, feature the most reliable I/O design to maximize connectivity, and support wireless modules (WiFi/3G/LTE), making them suitable for a diverse range of communication applications.

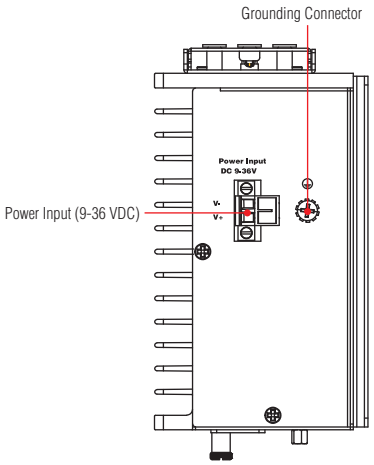
Powered by a wide operating temperature range (-40 to 70°C) and Safety/EMI/EMS compliances, the MC-1100 series is ideal for intelligent computing and communication solutions in critical environments, including marine communication, oil & gas field site monitoring, and transportation.

The MC-1100 series supports “Moxa Hardware Monitoring” for device I/O status monitoring and alerts, system temperature monitoring and alerts, and system power management. Monitoring system status closely makes it easier to recover from errors and provides the most reliable platform for your applications.

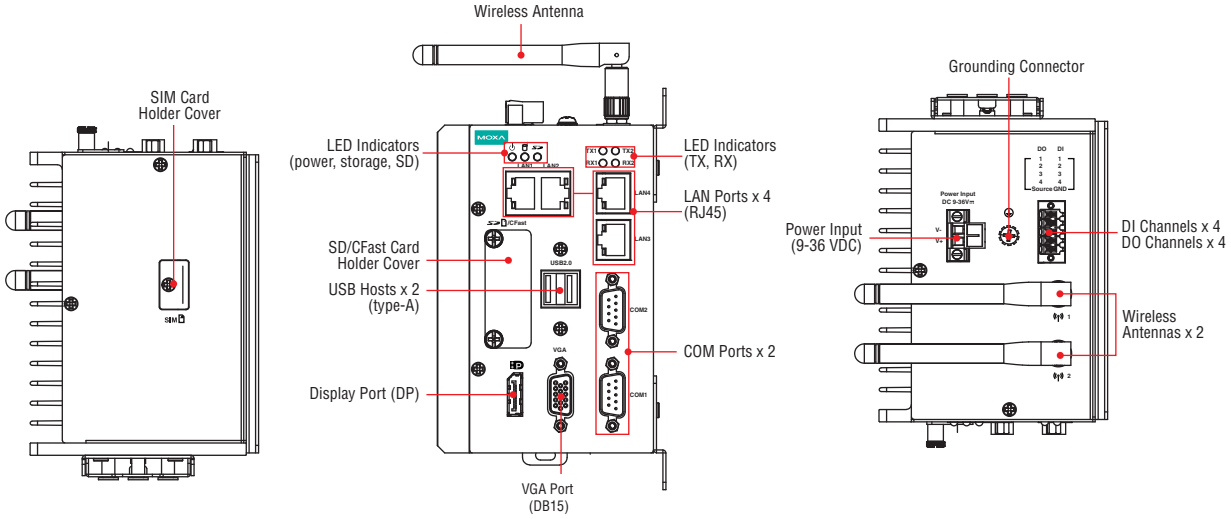
Appearance

MC-1111





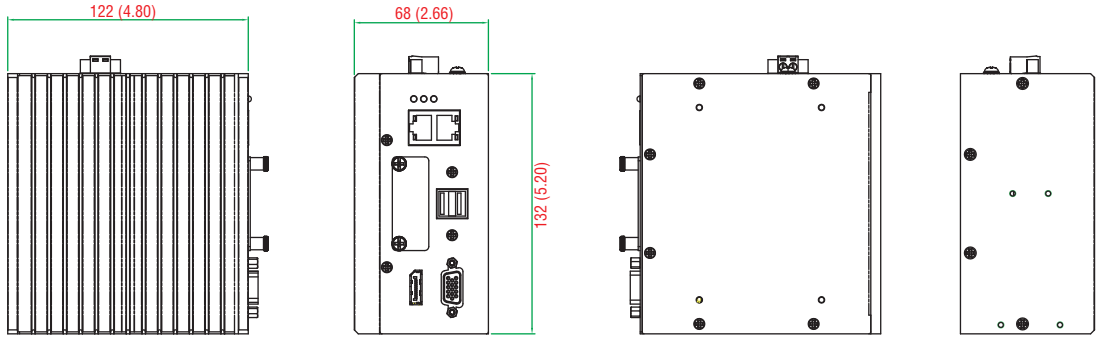
MC-1121



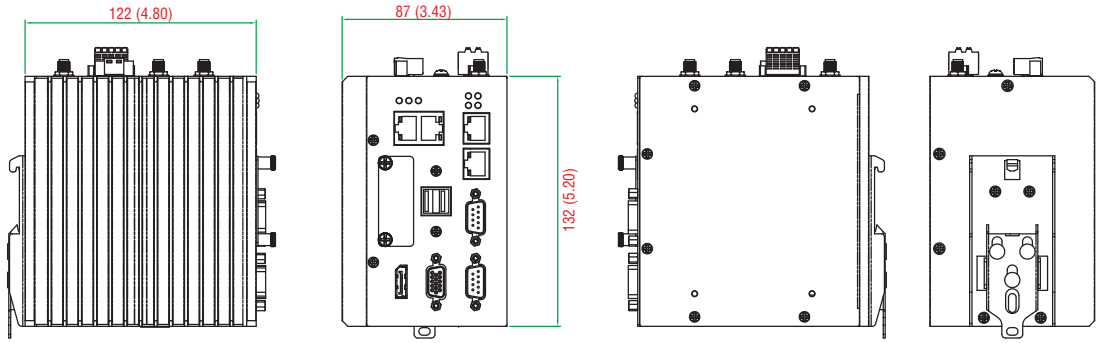
Dimensions

Unit: mm (inch)

MC-1111



MC-1121



Specifications

Computer

CPU:
• Intel® Atom™ processor E3845 (quad-core, 1M cache, 1.91 GHz)
• Intel® Atom™ processor E3826 (dual-core, 1M cache, 1.46 GHz)
System Memory: System Memory: 1 DDR3L SO-DIMM slot, 2 GB pre-installed, 8 GB max.
• E3826: supports DDR3L-1066
• E3845: supports DDR3L-1333
USB: USB 2.0 hosts x 2, Type A connectors
Storage:
• CFast: 1 CFast socket for OS storage
• SD: 1 SD 3.0 (SDHC/SDXC) socket for storage expansion

Other Peripherals

Expansion Slots: 1, Mini-PCIe socket
USIM Slots: 1

Display

Display Interface:
• VGA interface x 1: 15-pin D-Sub connector (female), with resolution up to 1920 x 1200 pixels at 75 Hz
• Display port interface x 1: Display port connector, with resolution up to 2560 x 1600 pixels at 60 Hz
Graphics Controller: Intel® HD Graphics 4000

Ethernet Interface

LAN: 4 auto-sensing 10/100/1000 Mbps ports (RJ45)
Magnetic Isolation Protection: 1.5 kV built in

Serial Interface

Serial Standards: 2 RS-232/422/485 ports, software-selectable (DB9 male)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 115.2 kbps

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Digital Input

Input Channels: DIs x 4, source-type
Input Voltage: 0 to 30 VDC at 25 Hz
Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open
Digital Input Levels for Wet Contacts:
• Logic level 1: +3 V max
• Logic level 0: +10 V to +30 V (Source to DI)
Connector Type: 10-pin screw-fastened Euroblock terminal
Isolation: 3 kV optical isolation

Digital Output

Output Channels: DOs x 4, sink-type
Output Current: 200 mA (max.) per channel
On-State Voltage: 24 VDC nominal, open collector to 30 VDC
Connector Type: 10-pin screw-fastened Euroblock terminal
Isolation: 3 kV optical isolation

LEDs

System: Power
Storage: CFast, SD
LAN: 2 LEDs per port (100/1000 Mbps)
Serial: 2 LEDs per port (Tx and Rx)

Physical Characteristics

Housing: Aluminum, sheet metal
Weight:
• MC-1111: 1.21 kg (2.69 lb)
• MC-1121: 09.7 g (2.16 lb)
Dimensions:
• MC-1111: 132 x 122 x 68 mm (5.20 x 4.81 x 2.68 in)
• MC-1121: 132 x 122 x 87 mm (5.20 x 4.81 x 3.43 in)
Mounting: DIN rail, wall (optional)

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 158°F)
Storage Temperature: -40 to 75°C (-40 to 158°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-vibration: 0.7 g @ DNV 2.4 (Class A), sine wave, 2-100 Hz, 1 Oct./min., 1.5 hr per axis

Power Requirements

Input Voltage: 9 to 36 VDC, isolated
Power Consumption: Less than 30 W

Standards and Certifications

Safety: UL 60950-1, CCC
EMC: EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class A
Marine Standards: IEC 60945 4th
Marine Type Approval: DNV 2.4
Green Product: RoHS, cRoHS, WEEE

Reliability

Automatic Reboot Trigger: Built-in watchdog timer (WDT), configurable for resets following 1-255 second hang intervals; software programmable

Warranty

Warranty Period: 3 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models

MC-1111-E2-T: x86 embedded computer with Intel Atom dual-core E3826 processor, 2 GB RAM, VGA, 2 USBs, 2 GigaLANs, 1 CFast socket, 1 SD slot, display port, 9 to 36 VDC power
MC-1111-E4-T: x86 embedded computer with Intel Atom dual-core E3845 processor, 2 GB RAM, VGA, 2 USBs, 2 GigaLANs, 1 CFast socket, 1 SD slot, display port, 9 to 36 VDC power
MC-1121-E2-T: x86 embedded computer with Intel Atom dual-core E3826 processor, 2 GB RAM, VGA, 2 USBs, 4 GigaLANs, 2 serial ports, 4 DIs, 4 DOs, 1 CFast socket, 1 SD slot, display port, 9 to 36 VDC power
MC-1121-E4-T: x86 embedded computer with Intel Atom dual-core E3845 processor, 2 GB RAM, VGA, 2 USBs, 4 GigaLANs, 2 serial ports, 4 DIs, 4 DOs, 1 CFast socket, 1 SD slot, display port, 9 to 36 VDC power

Package Checklist

- MC-1100 embedded computer
- Terminal block to power jack converter
- Din-rail mounting kit
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

Optional Accessories

Type		Model Name	Description
Power Adapters			
	Adapter	PWR-24250-DT-S1	Power adapter, input voltage 90 to 264 VAC, output voltage 24 V with 2.5 A DC load
	Power Cord	PWC-C7US-2B-183	Power cord with 2-pin connector, USA plug
	Power Cord	PWC-C7EU-2B-183	Power cord with 2-pin connector, Europe plug
	Power Cord	PWC-C7UK-2B-183	Power cord with 2-pin connector, British plug
	Power Cord	PWC-C7AU-2B-183	Power cord with 2-pin connector, Australia plug
	Power Cord	PWC-C7CN-2B-183	Power cord with 2-pin connector, China plug
WI-FI			
	Mini-PCIe Card		SprakLAN WPEA-251NI Wi-Fi mini card, black screws x 4
LTE/3G			
	Mini-PCIe Card		Telit LE910 mini card, LTE for North America and Europe, black screws x 4

Marine Displays and Panel Computers

Product Selection Guide

Marine Displays and Panel Computers 24-2

Marine Displays and Panel Computers

MD-215/219/224/226 Series: 15/19/24/26-inch marine displays 24-3

MD-119/124 Series: 19-inch and 24-inch type-approved ECDIS displays 24-6

MPC-2150/2190/2240/2260 Series: 15/19/24/26-inch fanless panel computers 24-9

Marine Displays and Panel Computers

Preliminary

	MD-119/124 Series	MD-219/224/226 Series	MD-215 Series	MPC-2190/2240/2260 Series	MPC-2150 Series
Computer					
CPU	–	–	–	Intel® Core™ i7-3517UE 1.7 GHz, or Intel® Celeron® 1047UE 1.4 GHz	Intel® Core™ i7-3517UE 1.7 GHz, or Intel® Celeron® 1047UE 1.4 GHz
Supported OS	–	–	–	Windows Embedded Standard 7 32/64-bit, Windows 7 Professional 32/64-bit	Windows Embedded Standard 7 32/64-bit, Windows 7 Professional 32/64-bit
OS Pre-installed	–	–	–	–	–
System Chipset	–	–	–	Intel® HM65 Express Chipset	Intel® HM65 Express Chipset
Memory Slot	–	–	–	1 SO-DIMM slot	1 SO-DIMM slot
System Memory Pre-installed	–	–	–	4 GB pre-installed (SDRAM)	4 GB pre-installed (SDRAM)
Expansion Bus	–	–	–	–	–
USB	–	–	–	USB 2.0 x 4, Type A connectors	USB 2.0 x 4, Type A connectors
Storage slot	–	–	–	MPC-2190: 1 2.5" HDD/SSD slot MPC-2240/2260: 2 2.5" HDD/SSD slot	1 2.5" HDD/SSD slot + 1 CFast slot
Storage Pre-installed	–	–	–	–	–
BIOS	–	–	–	64 Mbit Flash BIOS SPI type, ACPI function supported	64 Mbit Flash BIOS SPI type, ACPI function supported
Other Peripherals					
Audio	–	–	–	Line-in and line-out interface, with 3.5 mm mini jack	Line-in and line-out interface, with 3.5 mm mini jack
KB/MS	–	–	–	2 PS/2 interfaces	2 PS/2 interfaces
Buzzer	75 to 85 db (IEC 60945 compliant)	75 to 85 db (IEC 60945 compliant)	75 to 85 db (IEC 60945 compliant)	75 to 85 db (IEC 60945 compliant)	75 to 85 db (IEC 60945 compliant)
Display					
Panel Size	19/24 inches	19/24/26 inches	15 inches	19/24/26 inches	15 inches
Touch	Resistive touch	Projected capacitive touch	Projected capacitive touch, glove friendly	Projected capacitive touch	Projected capacitive touch, glove friendly
Aspect Ratio	• MD-119: 5:4 • MD-124: 16:9	• MD-219: 5:4 • MD-224: 16:9 • MD-226: 16:10	5:4	• MD-219: 5:4 • MD-224: 16:9 • MD-226: 16:10	5:4
Pixels	• MD-124: 1920 x 1080 • MD-119: 1280 x 1024 (WSXGA+)	• MD-219: 1280 x 1024 (SXGA) • MD-224: 1920 x 1080 (Full HD) • MD-226: 1920 x 1200 (WUXGA)	1024 x 768	• MD-219: 1280 x 1024 (SXGA) • MD-224: 1920 x 1080 (Full HD) • MD-226: 1920 x 1200 (WUXGA)	1024 x 768
Contrast Ratio	• MD-124: 5000:1 • MD-119: 1000:1	• MD-219: 2000: 1 • MD-224: 5000: 1 • MD-226: 1500: 1	700:1	• MD-219: 2000: 1 • MD-224: 5000: 1 • MD-226: 1500: 1	700:1
Light Intensity	• MD-124: 300 cd/m^2 • MD-119: 350 cd/m^2	• MD-219: 300 cd/m^2 • MD-224: 300 cd/m^2 • MD-226: 350 cd/m^2	1000 cd/m^2	• MD-219: 300 cd/m^2 • MD-224: 300 cd/m^2 • MD-226: 350 cd/m^2	1000 cd/m^2
Viewing Angles	• MD-124: 178° x 178° • MD-119: 170° x 160°	• MD-219: 178°/178° • MD-224: 178°/178° • MD-226: 176°/176°	170°/160°	• MD-219: 178°/178° • MD-224: 178°/178° • MD-226: 176°/176°	170°/160°
Max. No. of Colors	16.7M (8-bit)	16.7M (8-bit)	16.7M (8-bit)	16.7M (8-bit)	16.7M (8-bit)
Video inputs	DVI-I x 2, BNC composite x 3	DVI-D x 1, VGA x 1 (DB15 female)	DVI-D x 1, VGA x 1 (DB15 female)	–	DVI-D x 1, VGA x 1 (DB15 female)
Video output	VGA x 1	–	–	DVI-D x 1, VGA x 1 (DB15 female)	–
Ethernet Interface					
LAN	–	–	–	10/100/1000 Mbps ports (RJ45 port) x 2	10/100/1000 Mbps ports (RJ45 port) x 2
Serial Interface					
Serial Standards	2 RS-232 port (DB9)	1 RS-232 port (DB9) 1 RS-422/485 port (terminal block)	1 RS-232 port (DB9) 1 RS-422/485 port (terminal block)	2 RS-232/422/485 ports, software-selectable (DB9 male)	2 RS-232/422/485 ports, software-selectable (DB9 male)
Physical Characteristics					
Housing	Aluminum sheet metal	Aluminum sheet metal	Aluminum sheet metal	Aluminum sheet metal	Aluminum sheet metal
Weight	• MD-124: 12 kg (26.46 lb) • MD-119: 9.7 kg (21.38 lb)	• MD-219: 7.8 kg (17.20 lb) • MD-224: 12 kg (26.46 lb) • MD-226: 15.2 kg (35.51 lb)	6.5 kg (13.44 lb)	• MD-219: 7.8 kg (17.20 lb) • MD-224: 12 kg (26.46 lb) • MD-226: 15.2 kg (35.51 lb)	6.5 kg (14.44 lb)
Dimensions	• MD-124: 85 x 593 x 384 mm (3.35 x 23.45 x 15.12 in) • MD-119: 82 x 483 x 444 mm (3.23 x 19.02 x 17.48 in)	• MD-219: 429 x 387 x 75 mm (16.89 x 15.24 x 2.95 in) • MD-224: 595 x 393 x 75 mm (23.43 x 15.47 x 2.95 in) • MD-226: 621 x 440 x 90 mm (24.45 x 17.48 x 3.57 in)	356 x 315 x 77.2 mm (14.02 x 12.40 x 3.04 in)	• MD-219: 429 x 387 x 75 mm (16.89 x 15.24 x 2.95 in) • MD-224: 595 x 393 x 75 mm (23.43 x 15.47 x 2.95 in) • MD-226: 621 x 440 x 90 mm (24.45 x 17.48 x 3.57 in)	356 x 315 x 77.2 mm (14.02 x 12.40 x 3.04 in)
Mounting	Console	VESA, desktop, panel	VESA, desktop, panel	VESA, desktop, panel	VESA, desktop, panel
System Cooling	Fan	Fanless	Fanless	Fanless	Fanless
Environmental Limits					
Operating Temperature	-15 to 55°C (5 to 131°F)	-15 to 55°C (5 to 131°F)	-40 to 70°C (-40 to 158°F)	-15 to 55°C (5 to 131°F)	-40 to 70°C (-40 to 158°F)
Storage Temperature	-20 to 60°C (-4 to 140°F)	-20 to 60°C (-4 to 140°F)	-40 to 70°C (-40 to 158°F)	-20 to 60°C (-4 to 140°F)	-40 to 70°C (-40 to 158°F)
Ambient Relative Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Power Requirements					
Input Voltage	• 24 VDC (18 to 36 VDC) • 110 to 230 VAC, 50/60 Hz	• 24 VDC (18 to 36 VDC) • 110 to 230 VAC, 50/60 Hz	• 12/24 VDC (9 to 36 VDC) • 100 to 240 VAC	• 24 VDC (18 to 36 VDC) • 110 to 230 VAC, 50/60 Hz	• 12/24 VDC (9 to 36 VDC) • 100 to 240 VAC
Standards and Certifications					
Safety	UL 60950-1, CCC	UL 60950-1, CCC	UL 60950-1, CCC	UL 60950-1, CCC	UL 60950-1, IEC 60950-1
EMC	EN 55022/24, CISPR 22, FCC Part 15B Class A	EN 55022/24, CISPR 22, FCC Part 15B Class A	EN 55022/24, CISPR 22, FCC Part 15B Class A	EN 55022/24, CISPR 22, FCC Part 15B Class A	EN 55022/24
Ingress Protection Rating	• Front: IP66 • Rear: IP22	• Front: IP54 • Rear: IP22	• Front: IP66 • Rear: IP22	• Front: IP54 • Rear: IP22	• Front: IP66 • Rear: IP22
Marine	IEC 60945 4th	IEC 60945 4th, DNV, IACS E10, IEC 61174	IEC 60945 4th, DNV, IACS E10	IEC 60945 4th, DNV, IACS E10, IEC 61174	–
Warranty					
Warranty Period	• System: 3 years • LCD panel: 1 year	• System: 3 years • LCD panel: 1 year	• System: 3 years • LCD panel: 1 year	• Computer system: 3 years • LCD panel: 1 year	• Computer system: 3 years • LCD panel: 1 year
Details	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty
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MD-215/219/224/226 Series

15/19/24/26-inch marine displays

- 15/19/24/26-inch display
- High quality LCD with LED backlight
- Color calibrated for ECDIS compliance
- Full range dimming, 0 to 100%
- SavvyTouch™ display controls
- Built-in RS-232/422/485 interfaces
- Dual power supplies (AC & DC)
- IP54 (front) / IP22 (rear) rated
- Optically bonded and touch panel models available on request

Introduction

The MD-215/219/224/226 series of marine displays comes with full range dimming, wide viewing angles and optional optical bonding. These displays are built with a small-profile modular design that allows easier integration into industrial marine systems, reducing deployment costs and overall time-to-market.

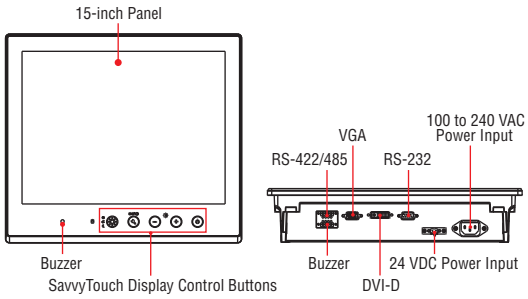
The innovative and user-friendly SavvyTouch display controls offer several unique features not found on any other marine display console: a proximity sensor for convenient adjustments in dark conditions, an info button for immediate updates on power status, and a quick-switch to adjust between day, dusk, and night-time ECDIS modes (for color-calibrated ECDIS models only).

The MD-215/219/224/226 series displays are compliant with IEC 60945, DNV, and IACS-E10, verifying their resilience and durability in maritime conditions. Their IP54 rated enclosure provides additional protection against dust and moisture above and beyond the limits established by these international standards bodies.

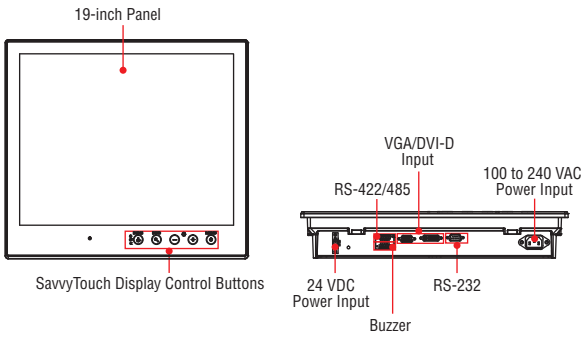
ECDIS-approved models are also available, offering an excellent HMI solution for ECDIS charting and navigation stations.

Appearance

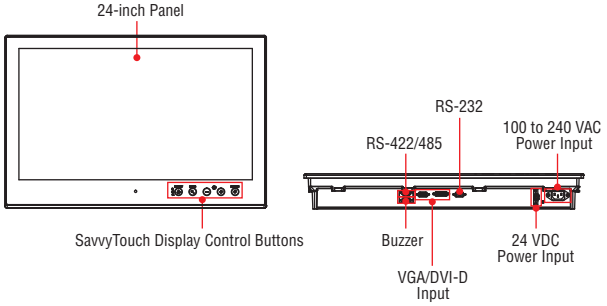
MD-215



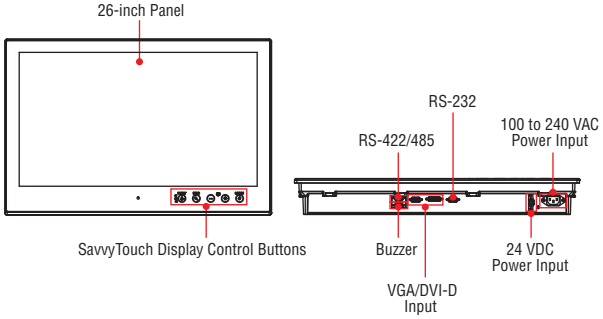
MD-219



MD-224



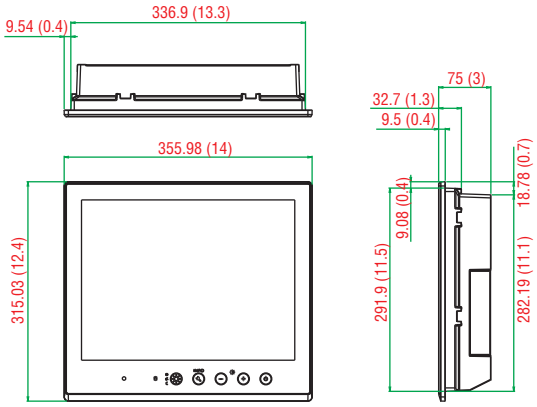
MD-226



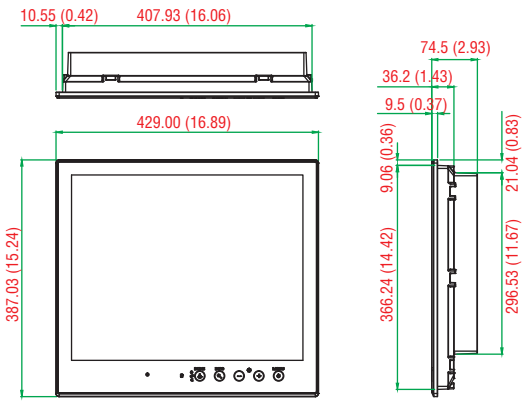
Dimensions

Unit: mm (inch)

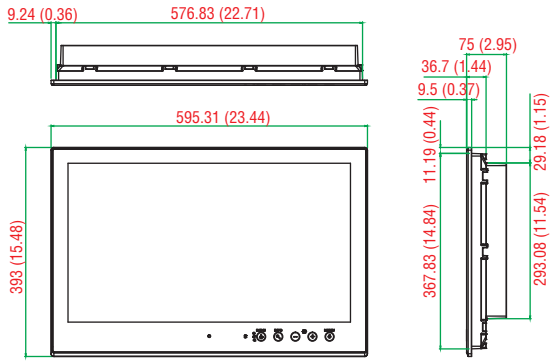
MD-215



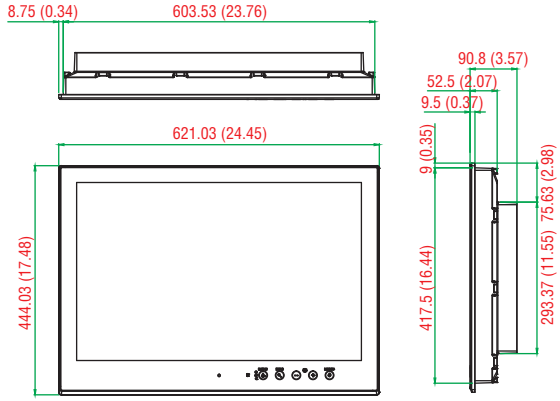
MD-219



MD-224



MD-226



Specifications

Display

Panel Size: 15/19/24/26-inch viewable image size
Panel Type: MVA
Aspect Ratio:
- MD-215: 5:4
- MD-219: 5:4
- MD-224: 16:9
- MD-226: 16:10

Pixels:
- MD-215: 1024 x 768
- MD-219: 1280 x 1024 (SXGA)
- MD-224: 1920 x 1080 (WSXGA+)
- MD-226: 1920 x 1200 (WUXGA)

Pixel Pitch (RGB):
- MD-215: 0.297 (H) x 0.297 (V) mm
- MD-219: 0.294 (H) x 0.294 (V) mm
- MD-224: 0.282 (H) x 0.282 (V) mm
- MD-226: 0.2865 (H) x 0.2865 (V) mm

Response Time:
- MD-215: 20 ms (gray to gray)
- MD-219: 20 ms (gray to gray)
- MD-224: 25 ms (gray to gray)
- MD-226: 15 ms (gray to gray)

Contrast Ratio:
- MD-215: 700: 1
- MD-219: 2000:1
- MD-224: 5000:1
- MD-226: 1500:1

Light Intensity: 300 cd/m/m
Viewing Angles:
- MD-215: 160°/140°
- MD-219/224: 178°/178°
- MD-226: 176°/176°

Active Display Area:
- MD-215: 304.128 (H) x 228.096 (V) mm
- MD-219: 376.32 (H) x 301.06 (V) mm
- MD-224: 531.36 (H) x 298.89 (V) mm
- MD-226: 550.08 (H) x 343.8 (V) mm

Max. No. of Colors: 16.7M / 8-bit color
Display Interface:
- 1 VGA input
- 1 DVI-D input

Resolution:
- VGA: 640 x 480
- SVGA: 800 x 600
- XGA: 1024 x 768
- SXGA: 1280 x 1024 (MD-219/224/226 only)
- WSXGA+: 1920 x 1080 (MD-224/226 only)
- WUXGA: 1920 x 1200 (MD-226 only)

Serial Interface

Serial Standards: 1 RS-232 port (male DB9), 1 RS-422/485 port (Euroblock)
Optical Isolation Protection: 3 kV

Serial Signals
RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Front Panel
LEDs: MENU, Brightness, INFO, ECDIS, Day/Dusk/Night
Smart OSD: Yes

Physical Characteristics
Housing: Aluminum sheet metal
Weight:
• MD-215: 6.1 kg (13.56 lb)
• MD-219: 7.8 kg (17.33 lb)
• MD-224: 12 kg (26.67 lb)
• MD-226: 15.2 kg (33.78 lb)
Dimensions:
• MD-215: 356 x 315 x 77.2 mm (14.02 x 12.40 x 3.04 in)
• MD-219: 429 x 387 x 75 mm (16.89 x 15.24 x 2.95 in)
• MD-224: 595 x 393 x 75 mm (23.43 x 15.47 x 2.95 in)
• MD-226: 621 x 440 x 90 mm (24.45 x 17.48 x 3.57 in)
Mounting: VESA (optional), panel (optional), desktop (optional)

Environmental Limits
Operating Temperature: -15 to 55°C (5 to 131°F)
Storage Temperature: -20 to 60°C (-4 to 140°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
IP Rating:
• Front: IP54
• Rear: IP22
Anti-vibration: 0.7 g @ DNV 2.4 (Class A), sine wave, 2-100 Hz, 1 Oct./min., 1.5 hr per axis

Power Requirements
Input Voltage:
• DC: 24 VDC (with tolerance from 18 to 30 VDC, 2-pin terminal block)
• AC: 100 to 240 VAC
Power Consumption: 40 W max.

Standards and Certifications
Safety: UL 60950-1, EN 60950-1, IEC 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 1 kV
Marine: IEC 60945 4th, IEC 61174, DNV2.4, IACS E10
Green Product: RoHS, cRoHS, WEEE

Warranty
Warranty Period: 1 year
Details: See www.moxa.com/warranty

We recommend taking the following precautions to minimize heat build-up within the display:

- Position the display within ±40° of the vertical.
- Install an external fan to increase airflow upwards through the display if (a) the display is not positioned within ±40° of the vertical, (b) the ambient temperature exceeds 25°C, or (c) the display is used in a location with minimal ventilation.

Important Safety Precaution:
Even though the display is rated to operate within the IEC 60945 standard of -15 to 55°C, it is best to ensure that the ambient temperature does not exceed 25°C. Doing so will increase the life of your display and minimize service costs.

Ordering Information

Available Models
MD-224X: 24-inch tape bonded marine display with 16:9 aspect ratio, full HD (1920 x 1080), LED backlighting, dual-power supply (AC/DC)
MD-224Z: 24-inch tape bonded marine display with 16:9 aspect ratio, full HD (1920 x 1080), projected-capacitive touch panel, LED backlighting, dual-power supply (AC/DC)
MD-215X-T: 15-inch display, DVI-D/VGA video output, AC/DC dual power, tape bonding
MD-215Z-T: 15-inch display, DVI-D/VGA video output, AC/DC dual power, multitouch w/ glove friendly, tape bonding
MD-219X: 19-inch, 5:4 aspect ratio display (1280 x 1024), LED backlight, DVI-D/VGA, RS-232 and RS-422/485 serial ports, AC/DC dual power, tape bonding
MD-219Z: 19-inch, 5:4 aspect ratio display (1280 x 1024), projected capacitive multitouch, LED backlight, DVI-D/VGA, RS-232 and RS-422/485 serial ports, AC/DC dual power, tape bonding
MD-226X: 26-inch, 16:10 aspect ratio display (1920 x 1200), LED backlighting, RS-232/422/485 serial ports, dual-power supply (AC/DC)

Package Checklist
- MD-215/219/224/226 display
- VGA cable
- DVI-D cable
- 2-pin terminal block x 1
- 5-pin terminal block x 2
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately, for AC power input)
PWC-C13US-3B-183: 10A/125V North American (US) power cord, 183 cm
PWC-C13EU-3B-183: 10A/250V Continental European (EU) power cord, 183 cm
PWC-C13UK-3B-183: 10A/250V United Kingdom (UK) power cord, 183 cm
PWC-C13AU-3B-183: 10A/250V Australian (AU) power cord, 183 cm
PWC-C13CN-3B-183: 10A/250V China (CN) power cord, 183 cm

Optional Mounting/Bracket Kits (can be purchased separately)
MPC-MD-2-24-PMTK: Panel-mounting kit
MPC-MD-2-24-VESAMTK: VESA-mounting kit
MPC-MD-2-24-26-DMTK w/o hinge: Desktop-mounting kit without hinge
MPC-MD-2-24-26-DMTK w/ hinge: Desktop-mounting kit with hinge
MPC-MD-2-19-PMTK: Panel-mounting kit
MPC-MD-2-19-VESAMTK: VESA-mounting kit
MPC-MD-2-19-DMTK w/o hinge: Desktop-mounting kit without hinge
MPC-MD-2-19-DMTK w/ hinge: Desktop-mounting kit with angle adjustment hinge
MPC-MD-2-15-PMTK: Panel-mounting kit with 8 screws
MPC-MD-2-15-VESAMTK: VESA-mounting bracket, 100 x 100 mm and 75 x 75 mm

MD-119/124 Series

19 inch and 24 inch type-approved ECDIS displays

- 19/24-inch marine display
- LED backlighting
- Full range dimming
- Dual power supplies (AC and DC)
- Picture-in-Picture (PIP) and Picture-by-Picture (PBP)
- ECDIS color calibration (by request)
- IP66 (front) and IP22 (rear) ratings

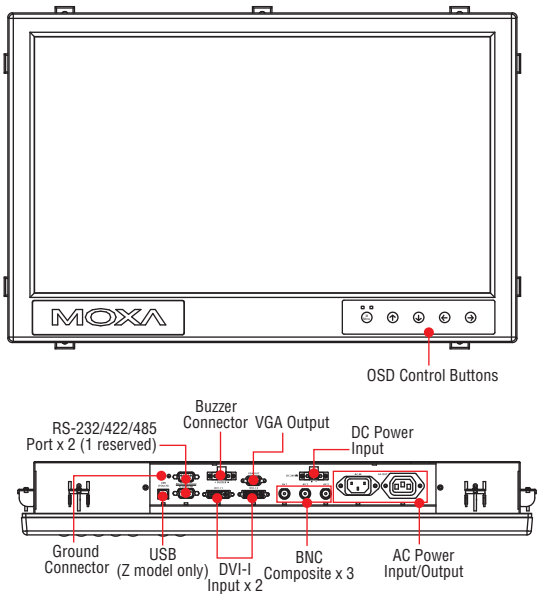
Overview

MD-119 and MD-124 marine displays are designed to meet the demanding performance and durability requirements of industrial-grade maritime service. The MD-119 has a 19 inch screen in a 5:4 aspect ratio, with 1280 x 1024 pixel resolution, PIP (Picture-in-a-Picture) and PBP (Picture-by-a-Picture). The MD-124 has a 24 inch screen in a 16:9 aspect ratio, a maximum resolution of 1920 x 1080, and also supports PIP and PBP. With full range dimming, wide viewing angles, both AC and DC power inputs, and optional touch screens or optical bonding, MD-119 / MD-124 marine displays are ideal not only for use in ECDIS stations, but for a variety of other applications, as well, whether outdoors or on the bridge.

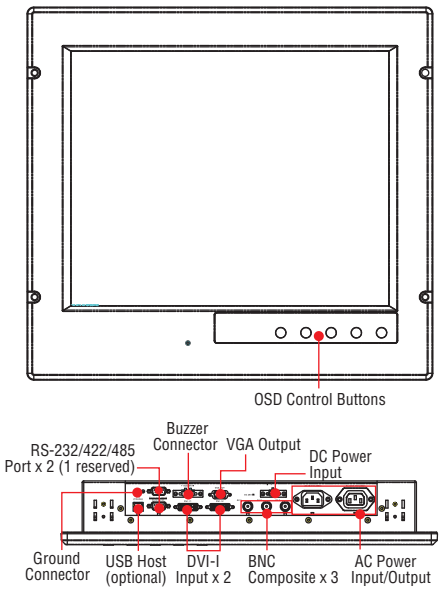
MD-124/MD-119 displays are compliant with a variety of industrial marine standards, including IEC 60945, IEC 61174, DNV, and IACS-E10, amply demonstrating their suitability for on-board marine uses.

Appearance

MD-124



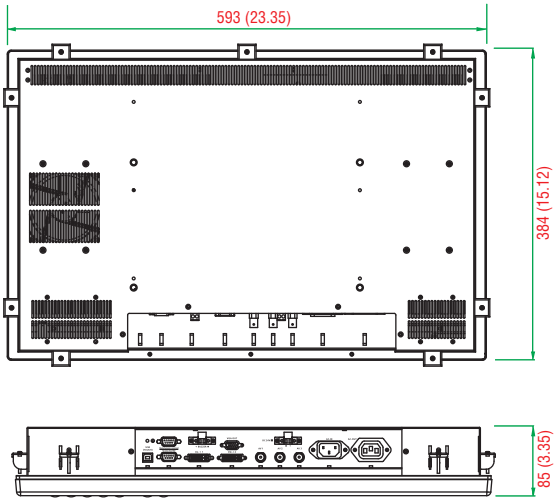
MD-119



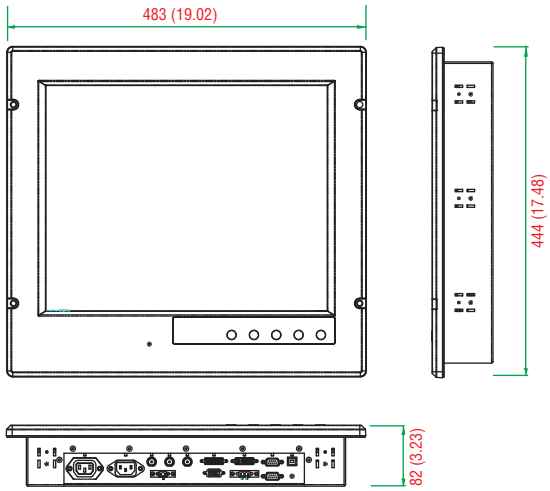
Dimensions

Unit: mm (inch)

MD-124



MD-119



Specifications

Display

Panel Size:
MD-124: 24-inch viewable image size
MD-119: 19-inch viewable image size
Panel Type: MVA
Aspect Ratio:
MD-124: 16:9
MD-119: 5:4
Pixels:
MD-124: 1920 x 1080
MD-119: 1280 x 1024 (WSXGA+)
Pixel Pitch (RGB):
MD-124: 0.282 (H) x 0.282 (V) mm
MD-119: 0.294 (H) x 0.294 (V) mm
Response Time:
MD-124: 8 ms (gray to gray)
MD-119: 5 ms (gray to gray)
Contrast Ratio:
MD-124: 5000:1
MD-119: 1000:1
Light Intensity:
MD-124: 300 cd/m/m
MD-119: 350 cd/m/m
Viewing Angles:
MD-124: 178° x 178° (right-left/up-down)
MD-119: 178° x 178° (right-left/up-down)
Active Display Area:
MD-124: 531.36 (H) x 298.89 (V) mm
MD-119: 376.32 (H) x 301.06 (V) mm / 14.81 (H) x 11.85 (V) in
Max. No. of Colors: 16.7M (8-bit)
Display Interface: VGA x 1, DVI-I x 2, BNC composite x 3
Resolution:
- VGA: 640 x 480
- SVGA: 800 x 600
- XGA: 1024 x 768
- SXGA: 1280 x 1024
- WSXGA+: 1920 x 1080 (optimal setting) (MD-124 only)

Serial Interface

Serial Standards: 1 software-selectable RS-232/422/485 port, male DB9

Serial Signals

RS-232: TxD, RxD, DTR, DSR, CTS, DCD, GND (RTS for MD-124)
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Front Panel

Panel Control Buttons: Power x 1, OSD controls x 4
LEDs: Status, Power

Physical Characteristics

Housing: Aluminum sheet metal
Weight:
MD-124: 12 kg (26.67 lb)
MD-119: 9.7 kg (21.56 lb)
Dimensions:
MD-124: 85 x 593 x 384 mm (3.35 x 23.45 x 15.12 in)
MD-119: 82 x 483 x 444 mm (3.23 x 19.02 x 17.48 in)
Mounting: Console mounting

Environmental Limits

Operating Temperature: -15 to 55°C (5 to 131°F)
Storage Temperature: -20 to 60°C (-4 to 140°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-vibration:
- 0.7 g @ DNV 2.4 (Class A), sine wave, 2-100 Hz, 1 Oct./min., 1.5 hr per axis
- 1 g @ DNV 2.4, random wave, 3-100 Hz, 2.5 hr per axis
- 2.1 g @ DNV 2.4 (Class C), sine wave, 2-50 Hz, 1 Oct./min., 1.5 hr

Power Requirements

Input Voltage:
- 24 VDC (with tolerance from 18 to 36 VDC, 2-pin terminal block)
- 110 to 230 VAC, 50/60 Hz

Power Consumption:
MD-119: 60 W max.
MD-124: 90 W max.

Standards and Certifications

Safety: UL 60950-1, CCC
EMC: EN 55022/24, CISPR 22, FCC Part 15B Class A
Marine: CCS
Green Product: RoHS, cRoHS, WEEE

Warranty

Warranty Period: 1 year
Details: See www.moxa.com/warranty

We recommend taking the following precautions to minimize heat build-up within the display:

- Position the display within ±40° of the vertical.
- Install an external fan to increase airflow upwards through the display if (a) the display is not positioned within ±40° of the vertical, (b) the ambient temperature exceeds 25°C, or (c) the display is used in a location with minimal ventilation.

Important Safety Precaution:

Even though the display is rated to operate within the IEC 60945 standard of -15 to 55°C, it is best to ensure that the ambient temperature does not exceed 25°C. Doing so will increase the life of your display and minimize service costs.

Ordering Information

Available Models

MD-124X: 24-inch tape bonded marine display with 16:9 aspect ratio, full HD (1920 x 1080), LED backlighting, multipower supply (AC/DC)
MD-124Y: 24-inch optically bonded marine display with 16:9 aspect ratio, full HD (1920 x 1080), LED backlighting, multipower supply (AC/DC)
MD-124Z: 24-inch marine touch-screen display with 16:9 aspect ratio, full HD (1920 x 1080), LED backlighting, multipower supply (AC/DC)
MD-119-X1: 19-inch type approved ECDIS marine display with 5:4 aspect ratio, 1280 x 1024 resolution, LED backlighting, tape bonding, and dual AC/DC power supplies

Package Checklist

- MD-119/MD-124 panel
- Rubber waterproofing gasket
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

MPC-2150/2190/2240/2260 Series

15/19/24/26-inch Fanless panel computers

- 15/19/24/26-inch panel computer
- Color calibrated for ECDIS compliance
- 3rd Generation Intel® processor (Intel® Core i7 3517UE 1.7 GHz or Celeron® 1047UE, 1.40 GHz)
- SavvyTouch™ display controls
- Fanless system design
- Built-in NMEA 0183 and 3-in-1 software selectable RS-232/422/485 interfaces
- Multipower supplies (AC & DC)

Introduction

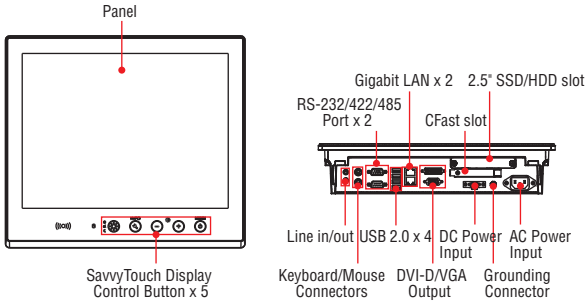
The MPC-2150/2190/2240/2260 series panel computers feature an Intel 3rd generation processor and 4 GB of system memory to deliver a reliable, high performance platform of wide versatility for use in industrial marine environments. With their RS-232/422/485 serial, NMEA 0183, and gigabit Ethernet LAN ports, the MPC-2260 series panel computers support a wide variety of serial and marine-specific interfaces as well as high speed IT communications, all with native network redundancy.

The MPC-2150/2190/2240/2260 series comes with a range of standard display enhancements useful in industrial environments (including 0 to 100% full range dimming, 178°/178° wide viewing angles, and optional optical bonding), as well as Moxa's innovative SavvyTouch display controls.

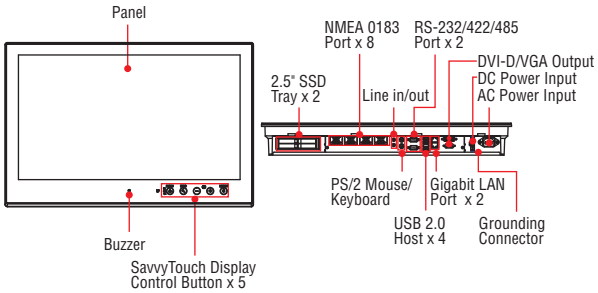
The MPC-2150/2190/2240/2260 panel computers are compliant with several industrial marine standards, including IEC 60945 4th, IEC 61174, DNV2.4, and IACS E10, verifying their resilient durability in marine operations. The MPC-2150/2190/2240/2260 are rugged, type approved, high performance, user-friendly panel computers perfect for ECDIS navigation systems and other marine IBS applications.

Appearance

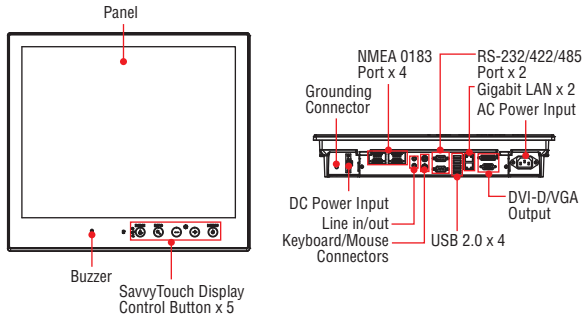
MPC-2150



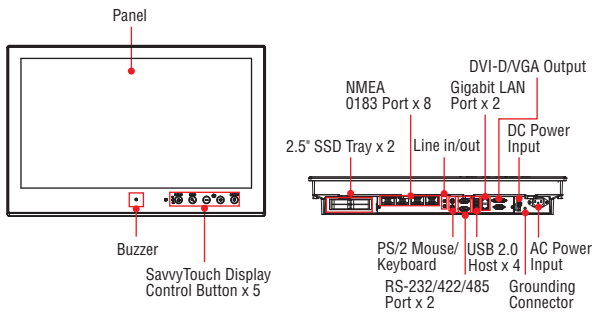
MPC-2240



MPC-2190



MPC-2260



Specifications

Computer

CPU: Intel® Core™ i7-3517UE 1.7 GHz, or Intel® Celeron® 1047UE 1.4 GHz
Supported OS: Windows Embedded Standard 7 32/64-bit, Windows 7 Professional 32/64-bit (the OS is not pre-installed)
System Chipset: Intel HM65
System Memory: 8 GB capacity, 4 GB pre-installed; 1 slot for a 4 GB DDR3-1600 204 pin SO-DIMM SDRAM
USB: USB 2.0 hosts x 4, type A connectors, supporting system boot up
Storage:
• MPC-2150: 1 2.5" HDD/SSD slot + 1 CFast slot (storage is not pre-installed)
• MPC-2190: 1 SATA-III interface: 6 Gbps
• MPC-2240/2260: 2 SATA-III interfaces: 6 Gbps, 2.5" removable storage trays
BIOS: 64 Mbit Flash BIOS with SPI, ACPI
Graphics Controller: Intel HM65 Express chipset built in
Video Outputs: DVI-D x 1, VGA x 1 (female)

Other Peripherals

Audio: line in/out, 3.5 mm mini jack
KB/MS: 2 PS/2 interfaces supporting standard PS/2 keyboard and mouse

Display

Panel Size: 15/19/24/26-inch viewable image size
Panel Type: MVA
Aspect Ratio:
• MPC-2150/2190: 5:4
• MPC-2240: 16:9
• MPC-2260: 16:10
Pixels:
• MPC-2150: 1024 x 768 (XGA)
• MPC-2190: 1280 x 1024 (SXGA)
• MPC-2240: 1920 x 1080 (WSXGA+)
• MPC-2260: 1920 x 1200 (WUXGA)
Pixel Pitch (RGB):
• MPC-2150: 0.297 (H) x 0.297 (V) mm
• MPC-2190: 0.294 (H) x 0.294 (V) mm
• MPC-2240: 0.276 (H) x 0.276 (V) mm
• MPC-2260: 0.2865 (H) x 0.2865 (V) mm
Response Time:
• MPC-2150/2190: 20 ms (gray to gray)
• MPC-2240: 25 ms (gray to gray)
• MPC-2260: 15 ms (gray to gray)
Contrast Ratio:
• MPC-2150: 700:1
• MPC-2190: 2000:1
• MPC-2240: 5000:1
• MPC-2260: 1500:1
Light Intensity: 300 cd/m/m
Viewing Angles:
• MPC-2150: 160°/140°
• MPC-2190/2240: 178°/178°
• MPC-2260: 176°/176°
Active Display Area:
• MPC-2150: 304.128 (H) x 228.096 (V) mm
• MPC-2190: 376.32 (H) x 301.06 (V) mm
• MPC-2240: 531.36 (H) x 298.89 (V) mm
• MPC-2260: 550.08 (H) x 343.8 (V) mm
Max. No. of Colors: 16.7M (8 bit color)
Resolution:
• VGA: 640 x 480
• SVGA: 800 x 600
• XGA: 1024 x 768
• SXGA: 1280 x 1024 (MPC-2190/2240/2260 only)
• WSXGA+: 1920 x 1080 (MPC-2240/2260 only)
• WUXGA: 1920 x 1200 (MPC-2260 only)

Ethernet Interface

LAN: Auto-sensing 10/100/1000 Mbps ports (RJ45) x 2
Magnetic Isolation Protection: 1.5 kV built in

Serial Interface

Serial Standards: 2 RS-232/422/485 ports, software-selectable (DB9 male)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 115.2 kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

NMEA Interface

Serial Standards:
• MPC-2190: 4 NMEA 0183 ports
• MPC-2240/2260: 8 NMEA 0183 ports
Base Serial Standard: RS-422
Optical Isolation Protection: ±6 kV contact discharge, ±8 kV air discharge
Voltage Differential: -15 to +15 V
Baudrate: 4800 bps
Data Bits: 8
Stop Bits: 1, 1.5, 2
Parity: None
Handshake: None

LEDs

System: Storage, Power
LAN: 100M/Link x 2, 1000M/Link x 2 (on connector)

Front Panel

LEDs:
MENU, Brightness, INFO, ECDIS, Day/Dusk/Night, Storage

Physical Characteristics

Housing: Aluminum sheet metal
Weight:
• MPC-2150: 6.5 kg (14.44 lb)
• MPC-2190: 7.8 kg (17.33 lb)
• MPC-2240: 12.4 kg (27.56 lb)
• MPC-2260: 16.6 kg (36.89 lb)
Dimensions:
• MPC-2150: 356 x 315 x 77.2 mm (14.02 x 12.40 x 3.04 in)
• MPC-2190: 429 x 387 x 74.5 mm (16.89 x 15.24 x 2.93 in)
• MPC-2240: 595 x 393 x 75 mm (23.44 x 15.48 x 2.95 in)
• MPC-2260: 621 x 444 x 90 mm (24.45 x 17.48 x 3.57 in)
Mounting: VESA (optional), panel (optional), desktop (optional)
System Cooling: Fanless thermal design

Environmental Limits

Operating Temperature:
• MPC-2150: -40 to 70°C (-40 to 158°F)
• MPC-2190/2240/2260: -15 to 55°C (5 to 131°F)
Storage Temperature:
• MPC-2150: -40 to 70°C (-40 to 158°F)
• MPC-2190/2240/2260: -20 to 60°C (-4 to 140°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Note: For MPC-2260 models, if you expect the storage temperature to exceed 40°C, please ensure that the ambient relative humidity remains below 95%.

IP Rating:
• MPC-2150: Front: IP66, Rear: IP22
• MPC-2190/2240/2260: Front: IP54, Rear: IP22
Anti-vibration: 0.7 g @ DNV2.4 (Class A), sine wave, 2-100 Hz, 1 Oct./min., 1.5 hr per axis
Anti-shock:
• MPC-2150: 20 g rms, half sine wave under system operating, 11 ms duration, compliant with IEC 60068-2-27 standard

Power Requirements

Input Voltage:
• 24 VDC, 6 A or (18 to 34 VDC, 8 A max.), screw-type terminal block
• 100 to 240 VAC, 50 to 60 Hz, 2 A, AC power inlet

Standards and Certifications

Safety: UL 60950-1, EN 60950-1, IEC 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 1 kV
Marine: IEC 60945 4th, IEC 61174, IEC 61162, DNV2.4, IACS E10
Green Product: RoHS, cRoHS, WEEE

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 levels for time interval system reset, software programmable

Warranty

Warranty Period:
• Computer systems: 3 years
• LCD panels: 1 year
Details: See www.moxa.com/warranty

We recommend taking the following precautions to minimize heat build-up within the display:

- Position the display within ±40° of the vertical.
- Install an external fan to increase airflow upwards through the display if (a) the display is not positioned within ±40° of the vertical, (b) the ambient temperature exceeds 25°C, or (c) the display is used in a location with minimal ventilation.

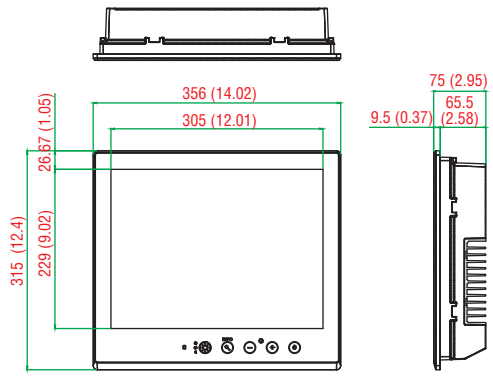
Important Safety Precaution:

Even though the display is rated to operate within the IEC 60945 standard of -15 to 55°C for bridge applications, it is best to ensure that the ambient temperature does not exceed 25°C. Doing so will increase the life of your display and minimize service costs.

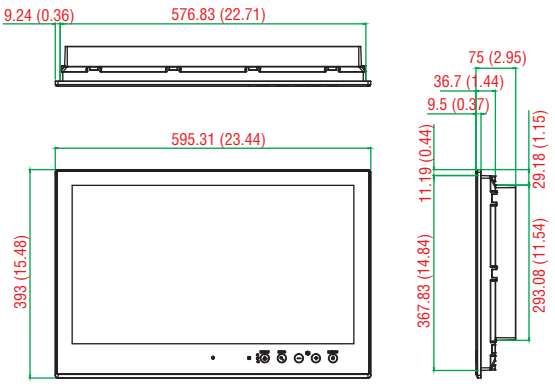
Dimensions

Unit: mm (inch)

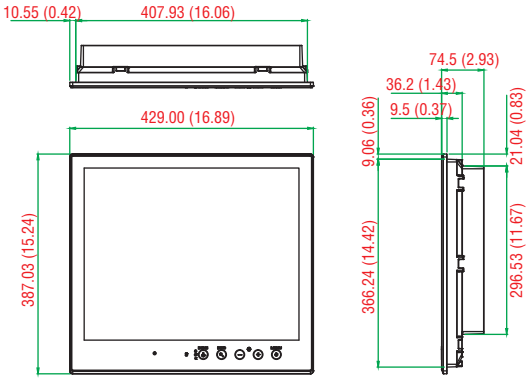
MPC-2150



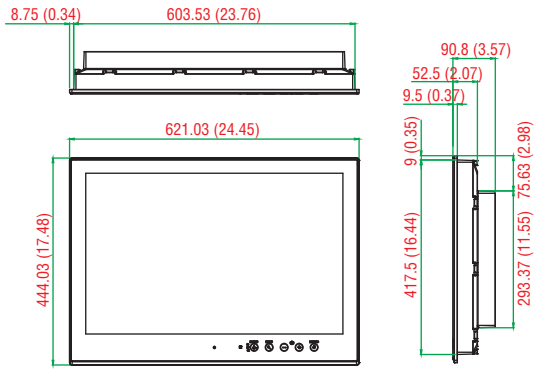
MPC-2240



MPC-2190



MPC-2260



Ordering Information

Available Models

MPC-2240X: 24-inch fanless panel computer with Intel Celeron 1047UE 1.4 GHz processor, NMEA 0183, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, SSD trays, dual AC/DC power inputs, tape bonding
MPC-2240Z: 24-inch fanless panel computer with Intel Celeron 1047UE 1.4 GHz processor, NMEA 0183, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, SSD trays, dual AC/DC power inputs, tape bonding, projected capacitive touch screen
MPC-2247X: 24-inch fanless panel computer with Intel Core i7 3517UE 1.7 GHz processor, NMEA 0183, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, SSD trays, dual AC/DC power inputs, tape bonding
MPC-2247Z: 24-inch fanless panel computer with Intel Core i7 3517UE 1.7 GHz processor, NMEA 0183, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, SSD trays, dual AC/DC power inputs, tape bonding, projected capacitive touch screen
MPC-2260X: 26-inch fanless panel computer with Intel Celeron 1047UE 1.4 GHz processor, NMEA 0183, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, SSD trays, dual AC/DC power inputs, tape bonding
MPC-2267X: 26-inch fanless panel computer with Intel Core i7 3517UE 1.7 GHz, NMEA 0183, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, SSD trays, dual AC/DC power inputs, tape bonding
MPC-2190X: 19-inch fanless panel computer with Intel Celeron 1047UE 1.4 GHz processor, NMEA 0183, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, dual AC/DC power inputs, tape bonding
MPC-2190Z: 19-inch fanless panel computer with Intel Celeron 1047UE 1.4 GHz processor, NMEA 0183, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, dual AC/DC power inputs, tape bonding, projected capacitive touch screen
MPC-2197X: 19-inch fanless panel computer with Intel Core i7 3517UE 1.7 GHz processor, NMEA 0183, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, dual AC/DC power inputs, tape bonding
MPC-2197Z: 19-inch fanless panel computer with Intel Core i7 3517UE 1.7 GHz processor, NMEA 0183, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, dual AC/DC power inputs, tape bonding, projected capacitive touch screen
MPC-2150X-T: 15-inch fanless panel computer with Intel® Celeron® 1047UE 1.4 GHz processor, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, -40 to 70°C operating temperature, 2.5-inch SSD tray and CFast slot, dual AC/DC power inputs, tape bonding
MPC-2150Z-T: 15-inch fanless panel computer with Intel® Celeron® 1047UE 1.4 GHz processor, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, -40 to 70°C operating temperature, 2.5-inch SSD tray and CFast slot, dual AC/DC power inputs, tape bonding, projected capacitive touch screen
MPC-2157X-T: 15-inch fanless panel computer with Intel® Core™ i7 3517UE 1.7 GHz processor, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, -40 to 70°C operating temperature, 2.5-inch SSD tray and CFast slot, dual AC/DC power inputs, tape bonding
MPC-2157Z-T: 15-inch fanless panel computer with Intel® Core™ i7 3517UE 1.7 GHz processor, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, -40 to 70°C operating temperature, 2.5-inch SSD tray and CFast slot, dual AC/DC power inputs, tape bonding, projected capacitive touch screen

Optional Accessories (can be purchased separately, for AC power input)

PWC-C13US-3B-183: 10A/125V North American (US) power cord, 183 cm
PWC-C13EU-3B-183: 10A/250V Continental European (EU) power cord, 183 cm
PWC-C13UK-3B-183: 10A/250V United Kingdom (UK) power cord, 183 cm
PWC-C13AU-3B-183: 10A/250V Australian (AU) power cord, 183 cm
PWC-C13CN-3B-183: 10A/250V China (CN) power cord, 183 cm

Optional Mounting Kits (can be purchased separately)

MPC-MD-2-15-PMTK: 8 screws for panel mount
MPC-MD-2-15-VESAMTK: VESA-mounting bracket, 100 x 100 mm and 75 x 75 mm

Optional Mounting/Bracket Kits (can be purchased separately)

MPC-MD-2-24-PMTK: Panel-mounting kit
MPC-MD-2-24-VESAMTK: VESA-mounting kit
MPC-MD-2-24-26-DMTK w/o hinge: Desktop-mounting kit without hinge
MPC-MD-2-24-26-DMTK w/ hinge: Desktop-mounting kit with hinge
MPC-MD-2-19-PMTK: Panel-mounting kit
MPC-MD-2-19-VESAMTK: VESA-mounting kit
MPC-MD-2-19-DMTK w/o hinge: Desktop-mounting kit without hinge
MPC-MD-2-19-DMTK w/ hinge: Desktop-mounting kit with angle adjustment hinge
MPC-MD-2-15-PMTK: Panel-mounting kit with 8 screws
MPC-MD-2-15-VESAMTK: VESA-mounting bracket, 100 x 100 mm and 75 x 75 mm

Package Checklist (MPC-2150)

- 1 MPC-2150 panel computer
- 1 2-pin terminal block for DC power input
- 2.5-inch SATA SSD/HDD installation kit
- Documentation and driver DVD
- Quick installation guide (printed)
- Warranty card

Package Checklist (MPC-2190)

- 1 MPC-2190 panel computer
- 2 keys for the locking removable storage trays
- 1 2-pin terminal block for DC power input
- 2 5-pin terminal blocks for NMEA 0183 v2 interfaces
- Hard disk installation kit
- Documentation and driver DVD
- Quick installation guide (printed)
- Warranty card

Package Checklist (MPC-2240)

- 1 MPC-2240 panel computer
- 2 keys for locking removable storage trays
- 1 2-pin terminal block for DC power input
- 4 5-pin terminal blocks for NMEA 0183 v2 interfaces
- Documentation and driver DVD
- Quick installation guide (printed)
- Warranty card

Package Checklist (MPC-2260)

- 1 MPC-2260 panel computer
- 2 keys for the locking removable storage trays
- 1 2-pin terminal block for DC power input
- 4 5-pin terminal blocks for NMEA 0183 v2 interfaces
- Documentation and driver DVD
- Quick installation guide (printed)
- Warranty card

Oil & Gas Displays and Panel Computers

Product Selection Guide

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Oil & Gas Displays and Panel Computers

MD-219Z-HB/224Z-HB Series: 19/24-inch sunlight readable displays 25-3
MD-215 Series: 15-inch rugged displays 25-6
MPC-2150 Series: 15-inch industrial fanless panel computers 25-9
EXPC-1519 Series: Zone 2 19-inch panel computers with multiple connectivity options 25-12
EXPC-1319 Series: Fanless rugged Zone 2 19-inch 1000-nit LCD panel computers with touchscreen 25-16

Oil & Gas Displays & Panel Computers

	MD-219Z-HB/224Z-HB Series	MD-215 Series	MPC-2150 Series	EXPC-1519 Series	EXPC-1319 Series
Computer					
CPU	–	–	Intel® Core™ i7-3517UE 1.7 GHz, or Intel® Celeron® 1047UE 1.4 GHz	Intel® Core™ i7-3555LE 2.5 GHz or Intel® Celeron® 1047UE 1.4 GHz Processor	Intel Atom D525 dual core 1.8 GHz processor
Supported OS	–	–	W7E, 32/64-bit W7P, 32/64-bit	W7E, 32/64-bit W7P, 32/64-bit	W7E, 32/64-bit W7P, 32/64-bit
OS Pre-installed	–	–	–	–	Windows Embedded Standard 7
System Chipset	–	–	Intel® HM65 Express Chipset	Intel® QM77 Express Chipset	Intel Pineview-D+ ICH8M
Memory Slots	–	–	1 SO-DIMM slot	2 SO-DIMM slots	2 SO-DIMM slots
System Memory Pre-installed	–	–	4 GB pre-installed (SDRAM)	4 GB pre-installed	2 GB pre-installed
Expansion Bus	–	–	–	1 mini PCIe socket (internal)	–
USB	–	–	USB 2.0 x 4	USB 2.0 x 1/3/4 (S1 model)	USB 2.0 x 2
Storage Slots	–	–	2.5-inch HDD/SSD x 1, CFast x 1	2.5-inch HDD/SSD x 1, CFast x 1	2.5-inch HDD/SSD x 1, CompactFlash x 1
Storage Pre-Installed	–	–	–	–	32 GB MLC SSD
Video Output	–	–	DVI-D x 1, VGA x 1 (DB15 female)	VGA x 1 (DB15 female) (S1 model)	VGA output (DB15 female)
Display					
Panel Size	19/24 inches	15 inches	15 inches	19 inches	19 inches
Touch	Projected capacitive touch, glove friendly	Projected capacitive touch, glove friendly	Projected capacitive touch, glove friendly	Projected capacitive touch, glove friendly	Resistive touch
Aspect Ratio	• MD-219Z-HB: 5:4 • MD-224Z-HB: 16:9	5:4	5:4	5:4	5:4
Pixels	• MD-219Z-HB: 1280 x 1024 (SXGA) • MD-224Z-HB: 1920 x 1080 (WSXGA+)	1024 x 768	1024 x 768	1280 x 1024	1280 x 1024
Contrast Ratio	• MD-219Z-HB: 2000:1 • MD-224Z-HB: 5000:1	700:1	700:1	1000:1	1000:1
Light Intensity	1000 cd/m²	1000 cd/m²	1000 cd/m²	1000 cd/m²	1000 cd/m²
Viewing Angles	178°/178°	160°/140°	160°/140°	170°/160°	170°/160°
Video Input	DVI-D x 1, VGA x 1 (DB15 female)	DVI-D x 1, VGA x 1 (DB15 female)	–	–	–
Ethernet Interface					
LAN	–	–	2 10/100/1000 Mbps ports (RJ45 port)	2 10/100/1000 Mbps ports (RJ45 port)	2 10/100/1000 Mbps ports (RJ45 port)
Optical Fiber Interface	–	–	–	2 multimode 100M fiber ports	2 multimode 100M fiber ports
WLAN	–	–	–	1 802.11b/g/n interface (available on request)	–
Serial Interface					
Serial Standards	1 RS-232 port (DB9) 1 RS-422/485 port (terminal block)	1 RS-232 port (DB9) 1 RS-422/485 port (terminal block)	2 RS-232/422/485 ports (DB9 male)	2 RS-232/422/485 ports (DB9 male)	2 RS-232/422/485 ports
Physical Characteristics					
Housing	Aluminum sheet metal	Aluminum sheet metal	Aluminum sheet metal	Aluminum	Aluminum
Weight	• MD-219Z-HB: 7.8 kg (17.33 lb) • MD-224Z-HB: 12 kg (26.67 lb)	6.5 kg (13.44 lb)	6.5 kg (14.44 lb)	15.8 kg (34.83 lb)	10.7 kg (23.78 lb) or 11.9 kg (26.44 lb)
Dimensions	• MD-219Z-HB: 429 x 387 x 75 mm (16.89 x 15.24 x 2.95 in) • MD-224Z-HB: 595 x 393 x 75 mm (23.43 x 15.47 x 2.95 in)	356 x 315 x 77.2 mm (14.02 x 12.40 x 3.04 in)	356 x 315 x 77.2 mm (14.02 x 12.40 x 3.04 in)	483 x 408 x 99.5 mm (19.02 x 16.06 x 3.92 in)	483 x 408 x 99 mm (19.02 x 16.06 x 3.90 in)
Mounting	VESA, desktop, panel	VESA, desktop, panel	VESA, desktop, panel	VESA, desktop, yoke, wall, panel	VESA, desktop, yoke, wall, panel
System Cooling	Fanless thermal design	Fanless thermal design	Fanless thermal design	Fanless thermal design	Fanless thermal design
Environmental Limits					
Operating Temperature	-20 to 60°C (-4 to 140°F)	-40 to 70°C (-40 to 158°F)	-40 to 70°C (-40 to 158°F)	-40 to 70°C (-40 to 158°F)	-20 to 60°C (-4 to 140°F) or -40 to 60°C (-40 to 140°F)
Storage Temperature	-20 to 60°C (-4 to 140°F)	-40 to 70°C (-40 to 158°F)	-40 to 70°C (-40 to 158°F)	-40 to 70°C (-40 to 158°F)	-40 to 80°C (-40 to 176°F)
Ambient Relative Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	–
Power Requirements					
Input Voltage	• DC: 24 VDC (with tolerance from 18 to 30 VDC, 2-pin terminal block) • AC: 100 to 240 VAC	• DC: 12/24 VDC (Range 9 to 36 VDC) • AC: 100 to 240 VAC	• DC: 12/24 VDC (Range 9 to 36 VDC) • AC: 100 to 240 VAC	• DC: 24 VDC (2-pin terminal block) • AC: 100 to 240 VAC (3-pin terminal block)	Typical 24 VDC
Standards and Certifications					
Safety	UL 60950-1, CCC	UL 60950-1, CCC	UL 60950-1, IEC 60950-1	UL 60950-1, IEC 60950-1	UL 60950-1, IEC 60950-1
Ingress Protection Rating	IP66 (front) / IP22 (rear)	IP66 (front) / IP22 (rear)	IP66 (front) / IP22 (rear)	IP66 (front) / IP22 (rear) / NEMA 4X	IP66 (front) / IP22 (rear) / NEMA 4X
Hazardous Environments	Class 1 Division 2	–	Class 1 Division 2, ATEX Zone2, IECEx	Class 1 Division 2, ATEX Zone2, IECEx	Class 1 Division 2, ATEX Zone2, IECEx
Marine	IEC 60945 4th, DNV, IACS E10, IEC 61174	IEC 60945 4th, DNV, IACS E10, IEC 61174	–	–	–
Green Product	RoHS, cRoHS, WEEE	RoHS, cRoHS, WEEE	RoHS, cRoHS, WEEE	RoHS, cRoHS, WEEE	RoHS, cRoHS, WEEE
Warranty					
Warranty Period	• System: 3 years • LCD panel: 1 year	• System: 3 years • LCD panel: 1 year	• Computer system: 3 years • LCD panel: 1 year	• Computer system: 3 years • LCD panel: 1 year	• Computer system: 3 years • LCD panel: 1 year
Details	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty
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MD-219Z-HB/224Z-HB Series

Preliminary

19/24-inch sunlight-readable display

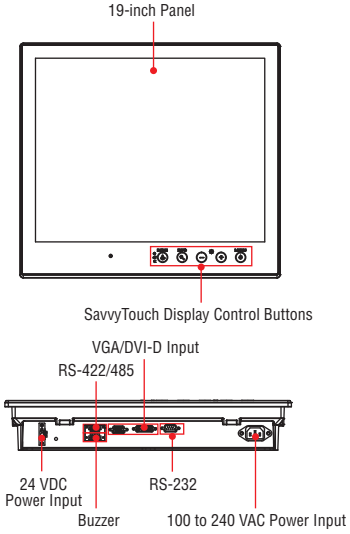
- 19/24-inch display
- 1000-nit LED backlight
- Glove-friendly multi touch
- Full-range dimming, 0 to 100%
- SavvyTouch™ display controls
- Built-in RS-232/422/485 interfaces
- Dual power supplies (AC & DC)
- IP66 (front) / IP22 (rear) rated
- Optically-bonded and touch-panel models available on request
- Marine DNV and oil & gas C1D2 certified

Introduction

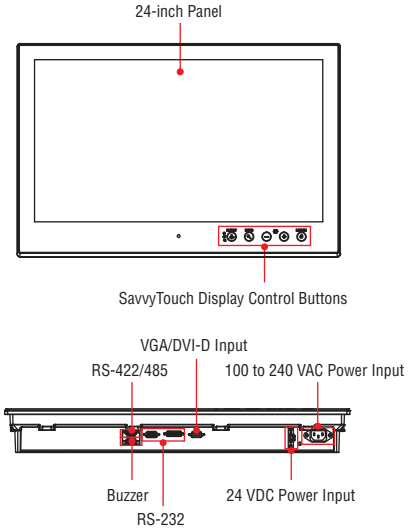
The MD-219Z/224Z-HB displays come with full-range dimming, wide viewing angles, and optional optical bonding features. These displays have a small-profile modular design that allows easier integration into industrial systems, reducing deployment costs and overall time-to-market. The innovative and user-friendly SavvyTouch display controls offer several unique features not found on any other marine display console: a proximity sensor for convenient adjustments in the dark, an info button for immediate updates on power status, and a quick-switch to adjust three different brightness modes. The MD-219Z/224Z-HB series displays are compliant with UL Class 1 Division 2, IEC 60945, DNV, and IACS-E10, verifying their resilience and durability in hazardous conditions. The displays' IP66-rated enclosure provides additional protection against dust and moisture above and beyond the limits established by these international standards.

Appearance

MD-219Z-HB



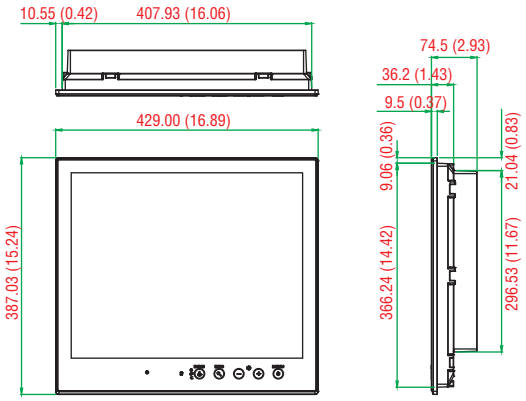
MD-224Z-HB



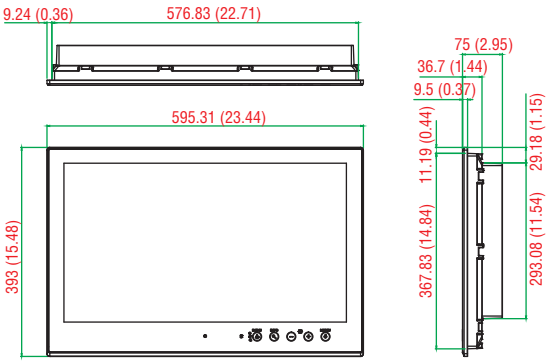
Dimensions

Unit: mm (inch)

MD-219Z-HB



MD-224Z-HB



Specifications

Display

Panel Size: 19/24-inch viewable image size
Panel Type: MVA
Aspect Ratio:
• MD-219Z-HB: 5:4
• MD-224Z-HB: 16:9
Pixels:
• MD-219Z-HB: 1280 x 1024 (SXGA)
• MD-224Z-HB: 1920 x 1080 (WSXGA+)
Pixel Pitch (RGB):
• MD-219Z-HB: 0.294 (H) x 0.294 (V) mm
• MD-224Z-HB: 0.282 (H) x 0.282 (V) mm
Response Time:
• MD-219Z-HB: 20 ms (gray to gray)
• MD-224Z-HB: 25 ms (gray to gray)
Contrast Ratio:
• MD-219Z-HB: 2000:1
• MD-224Z-HB: 5000:1
Light Intensity: 1000 cd/m/m
Viewing Angles: 178°/178°
Active Display Area: 531.36 (H) x 298.89 (V) mm
Max. No. of Colors: 16.7M (8-bit color)
Display Interface:
• 1 VGA input
• 1 DVI-D input
Resolution:
• VGA: 640 x 480
• SVGA: 800 x 600
• XGA: 1024 x 768
• SXGA: 1280 x 1024
• WSXGA+: 1920 x 1080 (optimal setting, MD-224Z-HB only)

Serial Interface

Serial Standards:
RS-232 ports (DB9) x 1, RS-422/485 ports (terminal block) x 1
Optical Isolation Protection: 4 kV

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Front Panel

LEDs: MENU, Brightness, INFO, ECDIS, Day/Dusk/Night
Smart OSD: Yes

Physical Characteristics

Housing: Aluminum sheet metal
Weight:
• MD-219Z-HB: 7.8 kg (17.33 lb)
• MD-224Z-HB: 12 kg (26.67 lb)
Dimensions:
• MD-219Z-HB: 429 x 387 x 75 mm (16.89 x 15.24 x 2.95 in)
• MD-224Z-HB: 595 x 393 x 75 mm (23.43 x 15.47 x 2.95 in)
Mounting: VESA (optional), panel (optional), desktop (optional)

Environmental Limits

Operating Temperature: -20 to 60°C (-4 to 140°F)
Storage Temperature: -20 to 60°C (-4 to 140°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
IP Rating:
• Front: IP66
• Rear: IP22
Anti-vibration: 0.7 Grms @ DNV 2.4 (Class A), sine wave, 2-100 Hz, 1 Oct./min., 1.5 hr per axis

Power Requirements

Input Voltage:
• DC: 24 VDC (with tolerance from 18 to 30 VDC, 2-pin terminal block)
• AC: 100 to 240 VAC
Power Consumption: 60 W (Max.)

Standards and Certifications

Safety: UL 60950-1, CCC
Hazardous Environments: UL Class 1 Division 2
EMC: EN 55022/24, CISPR 22, FCC Part 15B Class A
Marine: IEC 60945 4th, DNV, IACS E10, IEC 61174
Green Product: RoHS, cRoHS, WEEE

Warranty

Warranty Period: 3 years for system, 1 year for LCD panel
Details: See www.moxa.com/warranty

We recommend taking the following precautions to minimize heat build-up within the display:

- Position the display within ±40° of the vertical.
- Install an external fan to increase airflow upwards through the display if (a) the display is not positioned within ±40° of the vertical, (b) the ambient temperature exceeds 25°C, or (c) the display is used in a location with minimal ventilation.

Important Safety Precaution:

Even though the display is rated to operate within the IEC 60945 standard of -15 to 55°C, it is best to ensure that the ambient temperature does not exceed 25°C. Doing so will increase the life of your display and minimize service costs.

Ordering Information

Available Models

MD-224X: 24-inch tape bonded marine display with 16:9 aspect ratio, full HD (1920x1080), LED backlighting, dual-power supply (AC/DC)
MD-224Z: 24-inch tape bonded marine display with 16:9 aspect ratio, full HD (1920x1080), projected-capacitive touch panel, LED backlighting, dual-power supply (AC/DC)
MD-224Z-HB: 24-inch tape bonded display, 16:9 aspect ratio, full HD (1920x1080), 1000-nit sunlight readable, glove-friendly multi touch, LED backlighting, dual-power supply (AC/DC)
MD-219X: 19-inch, 5:4 aspect ratio display (1280x1024), LED backlight, DVI-D/VGA, RS-232 and RS-422/485 serial ports, AC/DC dual power, tape bonding
MD-219Z: 19-inch, 5:4 aspect ratio display (1280x1024), projected capacitive multi-touch, LED backlight, DVI-D/VGA, RS-232 and RS-422/485 serial ports, AC/DC dual power, tape bonding
MD-219Z-HB: 19-inch sunlight readable display, 5:4 aspect ratio (1280x1024), glove-friendly multi-touch, LED backlight, DVI-D/VGA, RS-232 and RS-422/485 serial ports, AC/DC dual power, tape bonding

Package Checklist

- MD-219/224 display
- VGA cable
- DVI-D cable
- 2-pin terminal block x 1
- 5-pin terminal block x 2
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately, for AC power input)

PWC-C13US-3B-183: 10A/125V North American (US) power cord, 183 cm
PWC-C13EU-3B-183: 10A/250V Continental European (EU) power cord, 183 cm
PWC-C13UK-3B-183: 10A/250V United Kingdom (UK) power cord, 183 cm
PWC-C13AU-3B-183: 10A/250V Australian (AU) power cord, 183 cm
PWC-C13CN-3B-183: 10A/250V China (CN) power cord, 183 cm

Optional Mounting/Bracket Kits (can be purchased separately)

MPC-MD-2-24-PMTK: Panel-mounting kit
MPC-MD-2-24-VESAMTK: VESA-mounting kit
MPC-MD-2-24-26-DMTK w/o hinge: Desktop-mounting kit without hinge
MPC-MD-2-24-26-DMTK w/ hinge: Desktop-mounting kit with hinge
MPC-MD-2-19-PMTK: Panel-mounting kit
MPC-MD-2-19-VESAMTK: VESA-mounting kit
MPC-MD-2-19-DMTK w/o hinge: Desktop-mounting kit without hinge
MPC-MD-2-19-DMTK w/ hinge: Desktop-mounting kit with hinge

MD-215 Series

Preliminary

15-inch rugged industrial display

- 15-inch industrial-grade display
- -40 to 70°C wide-temperature design
- 1000-nit sunlight-readable LCD
- Glove-friendly multi-touch (touch model only)
- Fanless system design
- Multiple power supplies (AC & DC)

Introduction

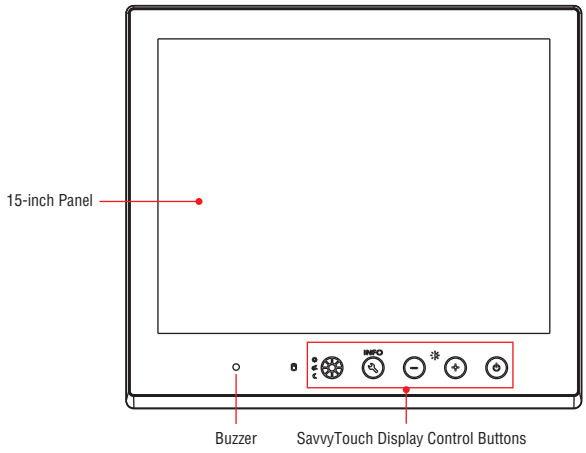
The MD-215 15-inch display has a rugged design for industrial environments. The display uses VGA and DVI-D video signals to support a 1024 x 768 resolution, and comes with RS-232/422/485 ports for connecting serial devices.

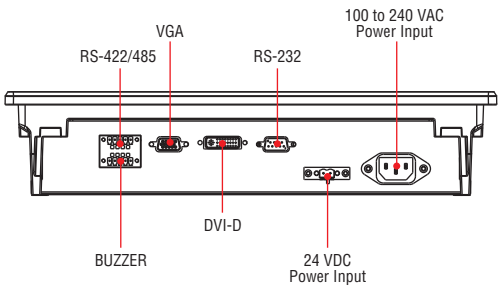
The MD-215 series panel computers are designed with a wide, -40 to 70°C temperature range and come with a patented, fanless, streamlined enclosure designed for highly efficient heat dissipation, making this one of the most reliable industrial platforms available for harsh, hot, outdoor environments, such as oil and gas fields and drilling platforms.

The MD-215 series also features a 1000-nit LCD panel offering a sunlight-readable, projected-capacitive, glove-friendly, multi-touch screen, providing an excellent touch panel for outdoor applications.

The MD-215 series supports both VESA- and panel-mounting, which can be implemented with accessories that can be purchased separately from Moxa.

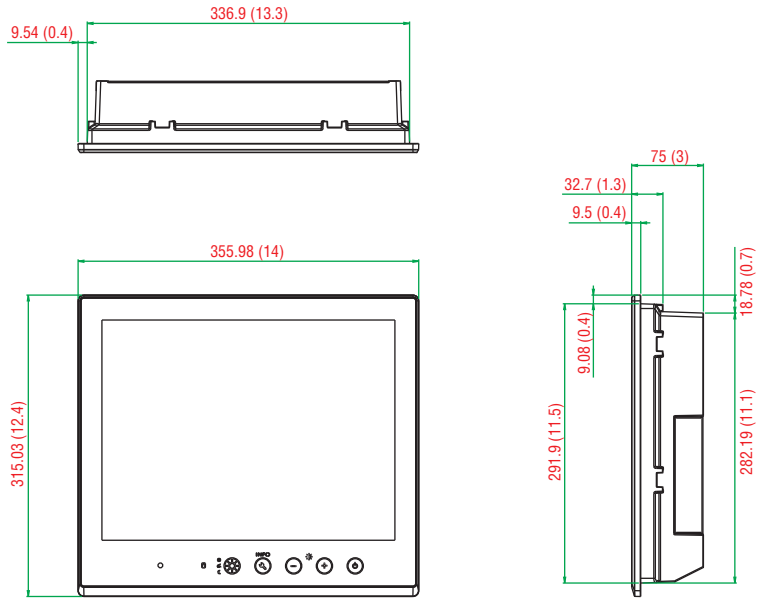
Appearance





Dimensions

Unit: mm (inch)



Specifications

Display

Panel Size: 15-inch readable image size
Panel Type: TN
Touch: Capacitive multi-touch with glove-friendly support (touch models only)
Aspect Ratio: 5:4
Pixels: 1024 x 768
Pixel Pitch (RGB): 0.297 (H) x 0.297 (V) mm
Response Time: 20 ms (gray to gray)
Contrast Ratio: 700:1
Light Intensity: 1000 cd/m/m
Viewing Angles: 160°/140°
Active Display Area: 304.128 (H) x 228.096 (V) mm
Display Interface: VGA input x 1, DVI-D input x 1

Serial Interface

Serial Standards: 1 RS-232 port (DB9), 1 RS-422/485 port (terminal block)
Optical Isolation Protection: 4 kV

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Front Panel

LEDs: MENU, brightness, INFO, Brightness mode, Day/Dusk/Night
Smart OSD: Yes

Physical Characteristics

Housing: Aluminum sheet metal
Weight: 6.1 kg (13.56 lb)
Dimensions: 356 x 315 x 77.2 mm (14.02 x 12.40 x 3.04 in)
Mounting: Panel (standard), VESA (mounting kit is optional)
System Cooling: Fanless thermal design

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 158°F)
Storage Temperature: -40 to 70°C (-40 to 158°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-vibration: 2 Grms, 5-500 Hz frequency, compliant with IEC 60068-2-6 standard
Anti-shock: 20 Grms, half sine wave under system operating, 11 ms duration, compliant with IEC 60068-2-27 standard

Power Requirements

Input Voltage:
• DC: 12/24 VDC (Range 9 to 36 VDC)
• AC: 100 to 240 VAC
Power Consumption: 60 W (max.)

Standards and Certifications

Safety: UL 60950-1, IEC 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
IEC 61000-4-11
Ingress Protection Rating: IP66 (front) / IP22 (rear)
Green Product: RoHS, cRoHS, WEEE

Warranty

Warranty Period: 3 years for system, 1 year for LCD panel
Details: See www.moxa.com/warranty

Ordering Information

Available Models

MD-215X-T: 15-inch display, DVI-D/VGA video output, AC/DC dual power, tape bonding
MD-215Z-T: 15-inch display, DVI-D/VGA video output, AC/DC dual power, multi-touch w/ glove friendly, tape bonding

Optional Mounting/Bracket Kits (can be purchased separately)

MPC-MD-2-15-PMTK: 8 screws for panel mount
MPC-MD-2-15-VESAMTK: VESA-mounting bracket, 100 x 100 mm and 75 x 75 mm

Package Checklist

- MD-215 display
- VGA cable
- DVI-D cable
- 2-pin terminal block x 1
- 5-pin terminal block x 2
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

MPC-2150 Series

15-inch industrial fanless panel computers

- 15-inch panel computer
- 3rd Generation Intel® processor (Intel® Core i7 3517UE 1.7 GHz or Celeron® 1047UE, 1.40 GHz)
- -40 to 70°C wide-temperature design
- 1000-nit sunlight-readable LCD
- Glove-friendly and multi-touch screen
- Fanless system design
- Class 1 Division 2, ATEX Zone 2*, and IECEx* certified
- Multiple power supplies (AC & DC)

*Certification is underway. Please check Moxa's website for the most up-to-date certification status.

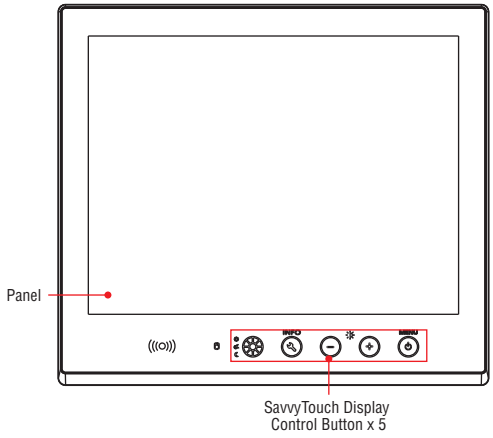
Introduction

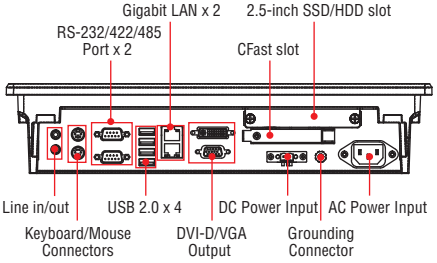
The MPC-2150 15-inch panel computers with 3rd Generation Intel® Core™ processor deliver a reliable, durable, high-performance platform of wide versatility for use in industrial environments. With its two software selectable RS-232/422/485 serial ports and two gigabit Ethernet LAN ports, the MPC-2150 panel computer supports a wide variety of serial interfaces as well as high-speed IT communications, all with native network redundancy. The MPC-2150 also comes with DVI-D and VGA video outputs, allowing you to extend the screen size and reduce the total cost of system development.

The MPC-2150 series panel computers are designed with a wide, -40 to 70°C temperature range, and come with a patented, fanless, streamlined enclosure designed for highly efficient heat dissipation, making this one of the most reliable industrial platforms available for harsh, hot, outdoor environments like oil and gas fields, or drilling platforms.

The MPC-2150 also features a 1000-nit LCD panel offering a sunlight-readable, projected-capacitive, glove-friendly, multi-touch screen, providing for an excellent user experience for applications outdoors.

Appearance





Specifications

Computer

CPU: Intel® Core™ i7-3517UE 1.7 GHz, or Intel® Celeron® 1047UE 1.4 GHz
Supported OS: Windows Embedded Standard 7 32/64-bit, Windows 7 Professional 32/64-bit (the OS is not pre-installed)
System Chipset: Intel® HM65 Express Chipset
System Memory: 4 GB pre-installed (SDRAM)
USB: USB 2.0 hosts x 4, type-A connectors, supporting system boot up
Storage: 1 2.5-inch HDD/SSD slot + 1 CFast slot (storage is not pre-installed)
BIOS: 64 Mbit Flash BIOS SPI type, ACPI function supported
Video Output: DVI-D x 1, VGA x 1 (female)
Buzzer: 75 to 85 db (IEC 60945 compliant)

Other Peripherals

Audio: Line-in and line-out interface, with 3.5 mm mini jack
KB/MS: 2 PS/2 interfaces supporting standard PS/2 keyboard and mouse

Display

Panel Size: 15-inch viewable image size
Panel Type: TN
Touch: Capacitive multi-touch with glove-friendly support (touch models only)
Aspect Ratio: 5:4
Pixels: 1024 x 768
Pixel Pitch (RGB): 0.297 (H) x 0.297 (V) mm
Response Time: 20 ms (gray to gray)
Contrast Ratio: 700:1
Light Intensity: 1000 cd/m/m
Viewing Angles: 178°/178°
Active Display Area: 304.128 (H) x 228.096 (V) mm
Max. No. of Colors: 16.7M (8 bit color)
Resolution:
• VGA: 640 x 480
• SVGA: 800 x 600
• XGA: 1024 x 768

Ethernet Interface

LAN: Auto-sensing 10/100/1000 Mbps ports (RJ45 port) x 2
Magnetic Isolation Protection: 1.5 kV, built-in

Serial Interface

Serial Standards: 2 RS-232/422/485 ports, software-selectable (DB9 male)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
Baudrate: 50 bps to 115.2 Kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

LEDs

System: Storage, Power
LAN: 100M/Link x 2, 1000M/Link x 2 (on connector)

Front Panel

LEDs: MENU, Brightness, INFO, Brightness Mode, Day/Dusk/Night, Storage
Smart OSD: Yes

Physical Characteristics

Housing: Aluminum sheet metal
Weight: 6.5 kg (14.44 lb)
Dimensions: 356 x 315 x 77.2 mm (14.02 x 12.40 x 3.04 in)
Mounting: Panel (standard), VESA (mounting kit is optional)
System Cooling: Fanless thermal design

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 158°F)
Storage Temperature: -40 to 70°C (-40 to 158°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-vibration: 2 Grms, 5-500 Hz frequency, compliant with IEC 60068-2-6 standard
Anti-shock: 20 Grms, half sine wave under system operating, 11 ms duration, compliant with IEC 60068-2-27 standard

Power Requirements

Input Voltage:
• DC: 12/24 VDC (Range 9 to 36 VDC)
• AC: 100 to 240 VAC
Power Consumption: Less than 120 W, 2.5 A @ 24 VDC

Standards and Certifications

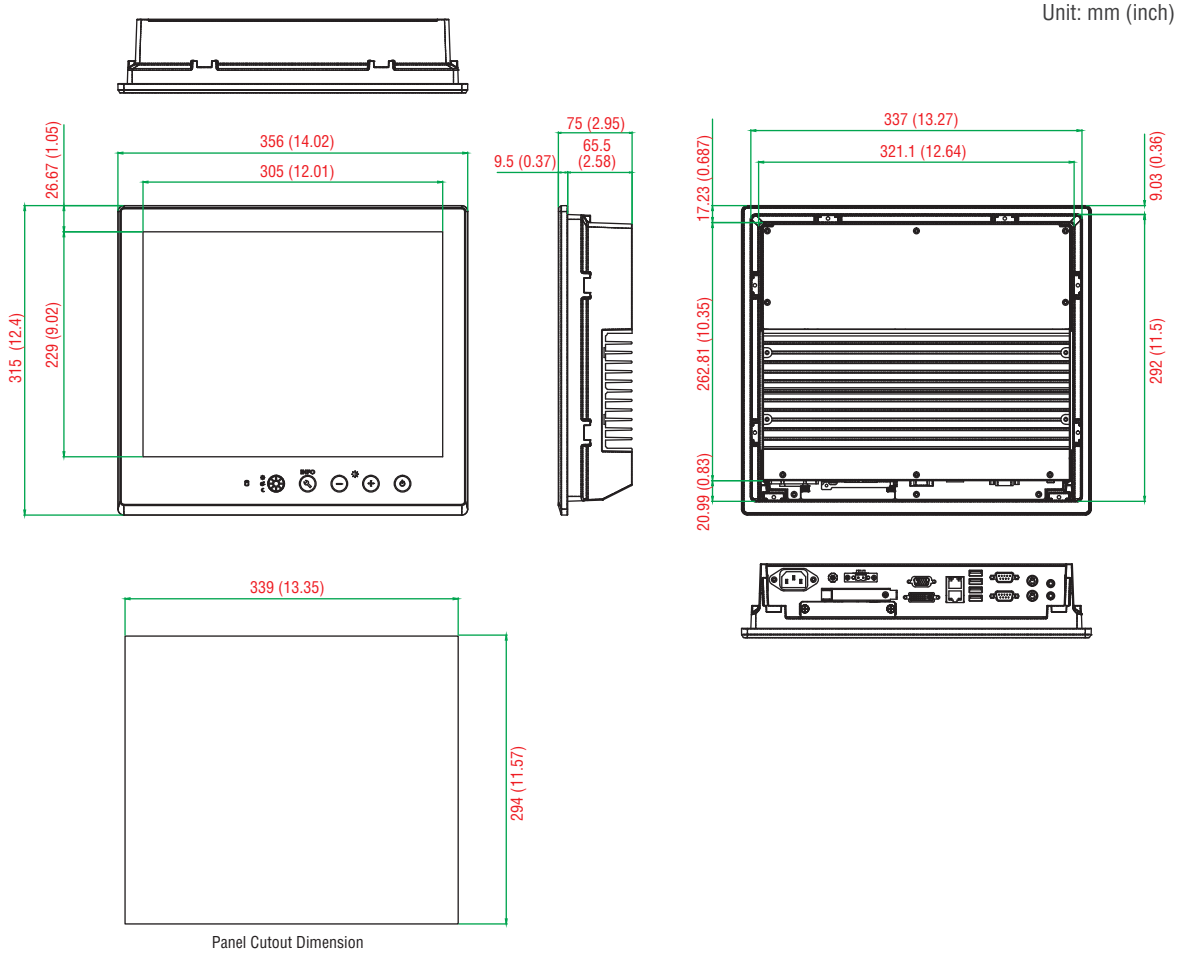
Safety: UL 60950-1, IEC 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8, IEC 61000-4-11
Ingress Protection Rating: IP66 (front) / IP22 (rear) / NEMA 4X
Green Product: RoHS, cRoHS, WEEE

Warranty

Warranty Period:
• Computer system: 3 years
• LCD panel: 1 year
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Panel Cutout Dimension

Ordering Information

Available Models

MPC-2150X-T: 15-inch fanless panel computer with Intel® Celeron® 1047UE 1.4 GHz processor, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, -40 to 70°C operating temperature, 2.5-inch SSD tray and CFast slot, dual AC/DC power inputs, tape bonding

MPC-2150Z-T: 15-inch fanless panel computer with Intel® Celeron® 1047UE 1.4 GHz processor, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, -40 to 70°C operating temperature, 2.5-inch SSD tray and CFast slot, dual AC/DC power inputs, tape bonding, projected-capacitive touch screen

MPC-2157X-T: 15-inch fanless panel computer with Intel® Core™ i7 3517UE 1.7 GHz processor, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, -40 to 70°C operating temperature, 2.5-inch SSD tray and CFast slot, dual AC/DC power inputs, tape bonding

MPC-2157Z-T: 15-inch fanless panel computer with Intel® Core™ i7 3517UE 1.7 GHz processor, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, -40 to 70°C operating temperature, 2.5-inch SSD tray and CFast slot, dual AC/DC power inputs, tape bonding, projected-capacitive touch screen

Package Checklist

- 1 MPC-2150 panel computer
- 1 2-pin terminal block for DC power input
- 2.5-inch SATA SSD/HDD installation kit
- Documentation and driver DVD
- Quick installation guide (printed)
- Warranty card

Optional Mounting Kits (can be purchased separately)

MPC-MD-2-15-PMTK: 8 screws for panel mount

MPC-MD-2-15-VESAMTK: VESA-mounting bracket, 100 x 100 mm and 75 x 75 mm

EXPC-1519 Series

Zone 2 19-inch panel computers with multiple connectivity options

- Anti-scratch, 19-inch sunlight viewable, 1000-nit LCD panel
- High performance Intel® 3rd generation Core™ i7-3555LE or Celeron 1047UE CPU
- Fanless design with highly efficient heat dissipation
- -40 to 70°C extended operation temperature
- Multi-touch with glove-friendly touch screen interface
- Options of cable gland and standard USB Type-A/RJ45 connectors
- Totally sealed IP66 / NEMA 4X enclosure
- Class 1 Division 2, ATEX Zone 2*, and IECEx* certified
- Dual AC/DC power supply
- Optional WLAN, 100M Fiber optic connection

*Certification is underway. Please check Moxa's website for the most up-to-date certification status.

Introduction

The EXPC-1519 panel computers are designed for Zone 2 applications in hazardous environments, both indoors and outdoors. The EXPC-1519 series features Intel® 3rd generation Core™ i7-3555LE 2.5 GHz or Celeron 1047UE 1.4 GHz processor, with up to 16 GB of memory to deliver high performance processing.

The EXPC-1519 series offers flexible interface connectivity options to meet your application needs: standard connectors with cable glands, terminal block with cable glands, and standard connectors on the bottom panel.

The EXPC-1519 computers are designed with wide temperature range (-40 to 70°C) and come with a patented, fanless, streamlined enclosure designed for highly efficient heat dissipation, making this one of the most reliable industrial platforms available for harsh, hot outdoor environments like oil and gas fields, or drilling platforms.

In addition, the EXPC-1519 computers feature touchscreen controls with anti-reflection treatment and 1000-nit LED backlight, making them easy to read even during the peak daylight hours.

Specifications

Computer

CPU: Intel® Core™ i7-3555LE 2.5 GHz or Intel® Celeron® 1047UE 1.4 GHz processor
OS: Windows Embedded Standard 7 32/64-bit, Windows 7 Professional 32/64-bit
System Chipset: Intel® QM77 Express Chipset (Intel® BD82QM77 PCH)
System Memory: 2 SO-DIMM slot, DDR3/DDR3L support, 4 GB pre-installed, maximum 16 GB capacity
Expansion Bus: 1 mini PCIe socket
BIOS: 64 Mbit SPI Flash
Graphics Controller: Intel® HD Graphics 4000
Touchscreen: Projected capacitive touch, 7H surface hardness, anti-reflection treatment, glove-friendly

Storage

HDD Support: 2.5-inch SATA, 7 or 9.5 mm in height, access externally
CFast: Push-push type, access externally

Display

Panel Size: 19-inch SXGA, 1000-nit LED backlit LCD
Aspect Ratio: 5:4
Response Time: 5 ms
Contrast Ratio: 1000:1
Viewing Angles:
• Horizontal: 170° (left to right)
• Vertical: 160° (up to down)
Resolution:
• VGA: 640 x 480
• SVGA: 800 x 600
• XGA: 1024 x 768
• SXGA: 1280 x 1024

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
Baudrate: 50 bps to 115.2 Kbps

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Interface (EXPC-1519-C1-S1/EXPC-1519-C7-S1)

Connector type: On motherboard via cable glands
USB: USB 2.0 hosts x 3, type-A connectors
VGA: 15-pin D-Sub connector (DB15 female), with resolution up to 2048 x 1536 pixels with 32-bit color at 75 Hz
Serial Port: RS-232/422/485 ports (DB9 male) x 2, software-selectable
Ethernet: Auto-sensing 10/100/1000 Mbps ports (RJ45) x 2
Optical Fiber: Multimode 100M fiber optic ports x 2
AC: 100 to 240 VAC (3-pin terminal block)
DC: 24 VDC (2-pin terminal block)

Interface (EXPC-1519-C1-S2/EXPC-1519-C7-S2)

Connector Type: On terminal block via cable glands
USB: USB 2.0 hosts x 4, terminal block
Serial Port: RS-232/422/485 ports (terminal block) x 2, software-selectable
Ethernet: Auto-sensing 10/100/1000 Mbps ports (terminal block) x 2
Optical Fiber : Multimode 100M fiber optic ports x 2
AC: 100 to 240 VAC (3-pin terminal block)
DC: 24 VDC (2-pin terminal block)

Interface (EXPC-1519-C1-S3/EXPC-1519-C7-S3)

Connector Type: On bottom panel
USB: USB 2.0 hosts x 1, type-A connector
Ethernet: Auto-sensing 10/100/1000 Mbps port (RJ45) x 1
AC: 100 to 240 VAC (3-pin terminal block)
DC: 24 VDC (2-pin terminal block)

LEDs and Buttons

System LEDs: Power, Fiber1, Fiber2, LAN1, LAN2, Touch, Info, DAY, Dusk, Night
LAN LEDs: 100M/Link, 1000M/Link (on each RJ45 connector)
Buttons: Power, Brightness +/-, Fn, Touch, Info, Brightness mode

Physical Characteristics

Housing: Aluminum
Weight: 10.7 kg (23.78 lb)
Dimensions: 483 x 408 x 99.5 mm (19.02 x 16.06 x 3.92 in)
Mounting: VESA (100 x 100 mm), desktop, yoke, wall, panel

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 158°F)
Storage Temperature: -40 to 70°C (-40 to 158°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-vibration: 2 Grms, 5-500 Hz frequency, compliant with IEC 60068-2-6 standard
Anti-shock: 20 Grms, half sine wave under system operating, 11 ms duration, compliant with IEC 60068-2-27 standard

Power Requirements

Input Voltage: 100 to 240 VAC or 24 VDC (18 to 32 VDC, 2-pin terminal block)
Power Consumption: 100 to 240 VAC, 47 to 63 Hz, 1 A (less than 100 W) or 24 VDC, 6 A (less than 150 W)

Standards and Certifications

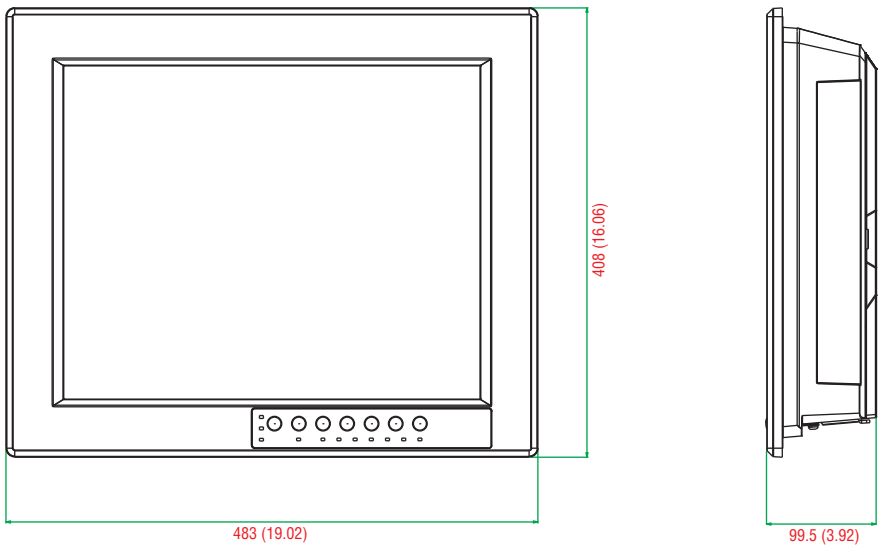
Safety: UL 60950-1, IEC 60950-1
Hazardous Environments: Class 1 Division 2
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge:
AC Power: 2 kV; Signal: 1 kV;
DC Power: 1 kV; Signal: 1 kV
IEC 61000-4-6 CS: 3 V
IEC 61000-4-8, IEC 61000-4-11
Ingress Protection Rating: IP66 / NEMA 4X
Green Product: RoHS, cRoHS, WEEE

Warranty

Warranty Period: 3 years for computer system, 1 year for LCD panel
Details: See www.moxa.com/warranty

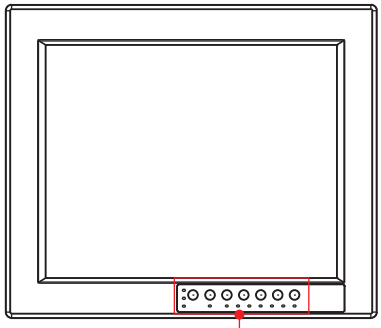
Dimensions

Unit: mm (inch)

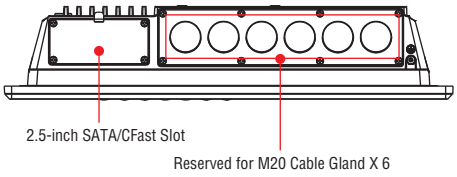


Appearance

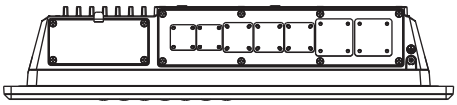
Front View



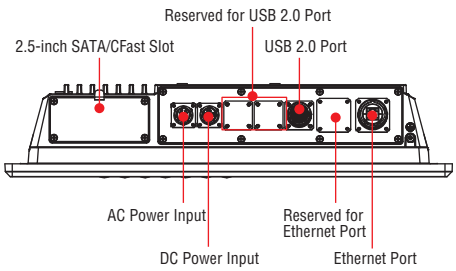
Bottom View (EXPC-1519-C1-S1-T, EXPC-1519-C7-S1-T, EXPC-1519-C1-S2-T, EXPC-1519-C7-S2-T)



Bottom View (EXPC-1519-C1-S3-T, EXPC-1519-C7-S3-T)



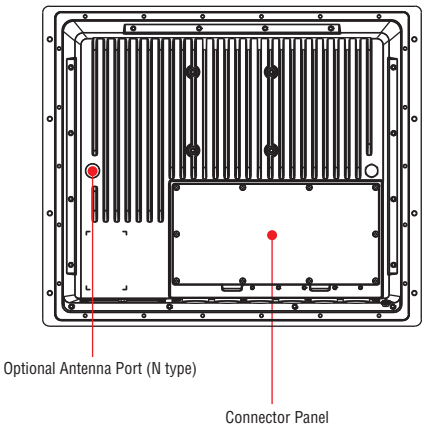
Out-of-the-box view; connectors must be installed by the user

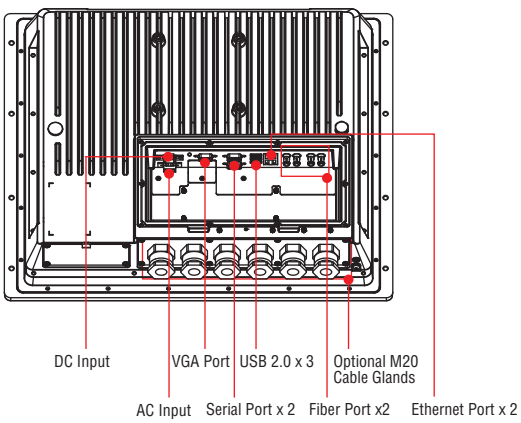


View with connectors installed

Rear View (EXPC-1519-C1-S1-T, EXPC-1519-C7-S1-T)

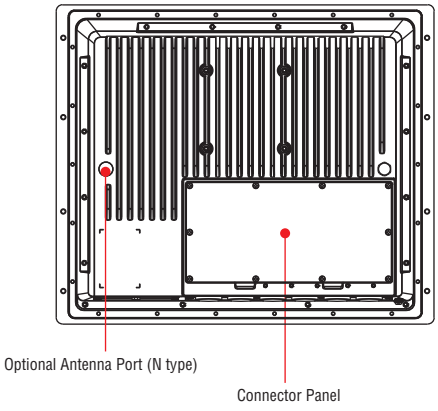
*Viewed at a 5-degree angle

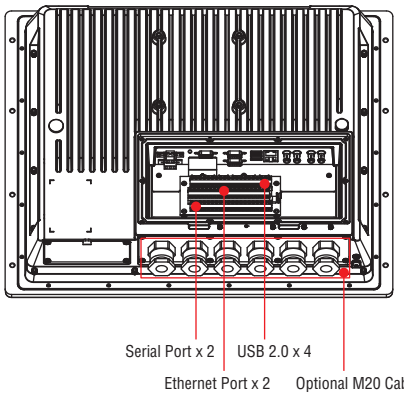




Rear View (EXPC-1519-C1-S2-T, EXPC-1519-C7-S2-T)

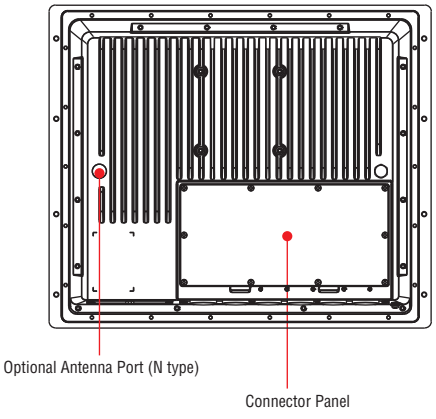
*Viewed at a 5-degree angle

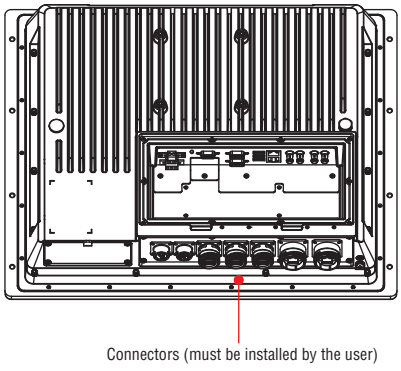




Rear View (EXPC-1519-C1-S3-T, EXPC-1519-C7-S3-T)

*Viewed at a 5-degree angle





Ordering Information

Available Models

EXPC-1519-C1-S1-T: Fanless, Zone 2 19-inch 1000-nit LCD panel computer, Intel® Celeron® Processor 1047UE 1.4 GHz, cable gland with standard I/O design, projected capacitive touch screen, IP66, -40 to 70°C operating temperature, 2.5-inch SSD tray and CFast slot

EXPC-1519-C1-S2-T: Fanless, Zone 2 19-inch 1000-nit LCD panel computer, Intel® Celeron® Processor 1047UE 1.4 GHz, cable gland with terminal block I/O design, projected capacitive touch screen, IP66, -40 to 70°C operating temperature, 2.5-inch SSD tray and CFast slot

EXPC-1519-C1-S3-T: Fanless, Zone 2 19-inch 1000-nit LCD panel computer, Intel® Celeron® Processor 1047UE 1.4 GHz, harsh environment I/O connector, projected capacitive touch screen, IP66, -40 to 70°C operating temperature, 2.5-inch SSD tray and CFast slot

EXPC-1519-C7-S1-T: Fanless, Zone 2 19-inch 1000-nit LCD panel computer, Intel® Core™ i7-3555LE Processor 2.5 GHz, cable gland with standard I/O design, projected capacitive touch screen, IP66, -40 to 70°C operating temperature, 2.5-inch SSD tray and CFast slot

EXPC-1519-C7-S2-T: Fanless, Zone 2 19-inch 1000-nit LCD panel computer, Intel® Core™ i7-3555LE Processor 2.5 GHz, cable gland with terminal block I/O design, projected capacitive touch screen, IP66, -40 to 70°C operating temperature, 2.5-inch SSD tray and CFast slot

EXPC-1519-C7-S3-T: Fanless, Zone 2 19-inch 1000-nit LCD panel computer, Intel® Core™ i7-3555LE Processor 2.5 GHz, harsh environment I/O connector, projected capacitive touch screen, IP66, -40 to 70°C operating temperature, 2.5-inch SSD tray and CFast slot

Package Checklist (EXPC-1519-C1-S3-T, EXPC-1519-C7-S3-T)

- 1 EXPC-1519 panel computer
- HDD/SSD installation kit
- USB female connector installation kit
- RJ45 female connector installation kit
- DC power installation kit
- AC power installation kit
- Quick installation guide
- Documentation and software DVD
- Warranty card

Package Checklist (EXPC-1519-C1-S1-T, EXPC-1519-C7-S1-T, EXPC-1519-C1-S2-T, EXPC-1519-C7-S2-T)

- 1 EXPC-1519 panel computer
- SSD/HDD installation kit
- 1 2-pin terminal block for DC power input
- 1 3-pin terminal block for AC power input
- Quick installation guide
- Documentation and software DVD
- Warranty card

EXPC-1319 Series

Award-winning Product
TAIWAN EXCELLENCE 2014

Fanless rugged Zone 2 19-inch 1000-nit LCD panel computers with touch screen

- Zone 2 certified for hazardous area applications
- High performance / low power Intel dual core Atom D525 1.8 GHz CPU
- Anti-scratch 19-inch sunlight-viewable 1000-nit LCD panel
- Self-health diagnostics software package for remote predictive maintenance
- -40 to 60°C extended operation temperature (with built-in Intelligent Heater)
- Completely sealed IP66 / NEMA 4X panel computer
- Fanless, streamlined enclosure for highly-efficient heat dissipation
- Touch screen control button to enable/disable touch screen interface
- Optional WLAN, 100M Fiber optic connection

Windows Embedded Standard 7

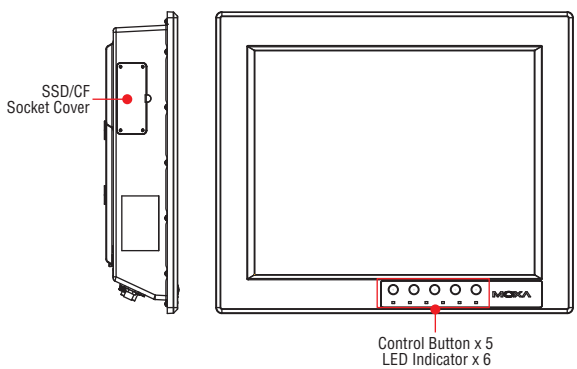
Introduction

The EXPC-1319 panel computers are fanless, durable devices made for both indoor and outdoor hazardous environments. The EXPC-1319 series features the Intel Atom dual core D525 1.8 GHz processor, with up to 4 GB of memory available to deliver high performance processing. The EXPC-1319 is Zone 2 certified, and comes with two electrically isolated, software-selectable RS-232/422/485 serial ports alongside two gigabit LAN ports, providing reliable serial and high speed Ethernet LAN transmissions with full network redundancy.

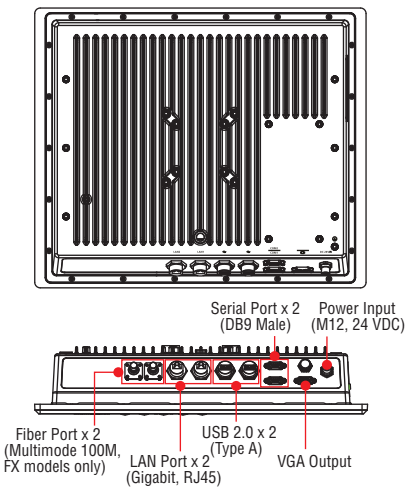
The EXPC-1319 computers come with a patented, fanless, streamlined enclosure designed for highly efficient heat dissipation, making this one of the most reliable industrial platforms available for harsh, hot outdoor environments like oil and gas fields, or drilling platforms. In addition, EXPC-1319 computers come with a self-health diagnostics software that can communicate over SNMP and has an expanded set of features. You can also order this software along with Moxa's Intelligent Heating Solution (IHS), a heating utility for use in extremely low temperature (-40°C) environments. Finally, these computers feature touchscreen controls with glass-film-glass bonding, making them scratch- and glare-resistant and easy to read even during the peak daylight hours.

Appearance

Front and Side Views

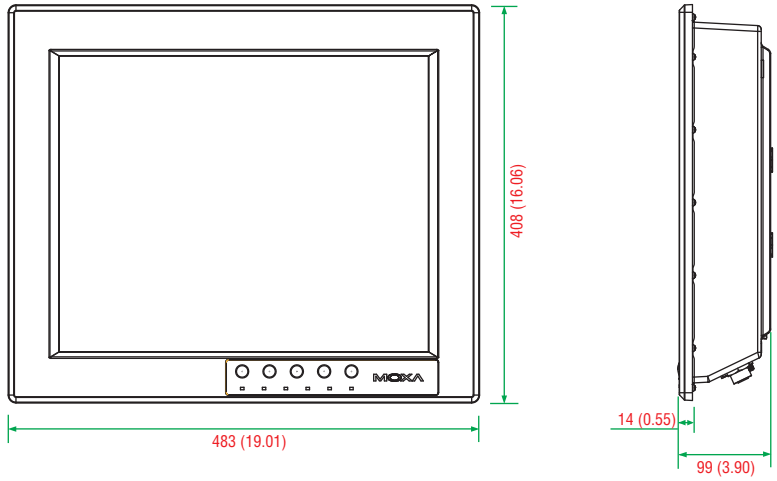


Rear and Bottom Views



Dimensions

Unit: mm (inch)



HardwareSpecifications

Computer
CPU: Intel Atom D525 dual core 1.8 GHz processor
OS: Windows Embedded Standard 7
System Chipset: Intel Pineview-D+ ICH8M
BIOS: 16 Mbit Flash BIOS, SPI type with ACPI
FSB: Intel GMA3150 integrated graphics controller
Video Output: VGA output, waterproof DB-15 (female) connector
System Memory: 4 GB capacity, 2 GB pre-installed: 2 slots of 2 GB DDR3-800 SO-DIMM SDRAM
Automatic Reboot Trigger: Built-in software-programmable watchdog timer for system resets, configurable from 1 to 255 second timeout intervals
Expansion Bus: 1 PCI-104 slot, 1 mini PCIe socket
USB: 2 USB 2.0 hosts, waterproof circular type-A connector
KB/MS: PS/2 interface supports both keyboard and mouse via Y type cable, waterproof connector (optional)

Storage
Storage Expansion:
• Onboard CompactFlash socket x 1
• One extra onboard SATA interface, supporting configurable RAID 0/1
Storage Support: Removable 32 GB industrial grade SSD (operating temperature: -40 to 85°C) to store OS; supports up to 256 GB

Display
Panel Size: 19-inch SXGA, 1000-nit LED backlit LCD
Aspect Ratio: 5:4
Response Time: 5 ms
Contrast Ratio: 1000:1
Viewing Angles:
• Horizontal: 170° (left to right)
• Vertical: 160° (up to down)
Max Colors: 16.7 M colors
Graphics Controller: Integrated Intel GMA3150 graphics controller
Video Output: VGA output, waterproof DB15 (female) connector
Resolution:
• VGA: 640 x 480
• SVGA: 800 x 600
• XGA: 1024 x 768
• SXGA: 1280 x 1024

Touchscreen
EXPC-1319-STS: Resistive single point glass-film-glass
Note: All EXPC-1319 touchscreens are scratch resistant and anti-glare, suitable for use outdoors around heavy equipment.

Ethernet Interface
Hardware Interface: Waterproof RJ45 connector
LAN: 2 auto-sensing 10/100/1000 Mbps ports
Optical Fiber Interface: 2 multimode 100M fiber-optic ports with waterproof Q-ODC connector (FX models only)
WLAN: 1 802.11b/g/n interface (available on request)
Magnetic Isolation Protection: 1.5 kV, built-in

Serial Interface
Serial Standards: 2 RS-232/422/485 ports, software-selectable
Connector Type: Waterproof DB9 (male)
Baudrate: Up to 38,400 bps
Isolation Protection: 2 kV

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: Up to 38,400 bps

Serial Signals
RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

LEDs and Buttons
LEDs: Power on/off, heater on/off, storage, LAN port communication x 2, fiber communication
Control Buttons: System on/off, brightness adjustment x 2, touchscreen on/off, programmable “Fn” button

Physical Characteristics
Housing: Aluminum
Weight:
• 10.7 kg (23.78 lb) (without Intelligent Heating Solution)
• 11.9 kg (26.44 lb) (with Intelligent Heating Solution)
Dimensions: 483 x 408 x 99 mm (19.02 x 16.06 x 3.90 in)
Mounting: Yoke, panel, mounting holes for VESA 75/100-mounting

Environmental Limits

Operating Temperature:
• Without Intelligent Heating Solution: -20 to 60°C (-4 to 140°F)
• With Intelligent Heating Solution: -40 to 60°C (-40 to 140°F)
Storage Temperature: -40 to 80°C (-40 to 176°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: 2 Grms, 5-500 Hz frequency, compliant with IEC 60068-2-6 standard
Anti-Shock: 20 g, half sine wave under system operating, 11 ms duration, compliant with IEC 60068-2-27 standard

Power Requirements

Input Voltage:
• Typical 24 VDC
• External 100 to 240 VAC isolated power supply unit (available on request)
Connector: M12, customizable
Power Consumption:
• Without Intelligent Heating Solution: 60 W
• With Intelligent Heating Solution: 120 W

Standards and Certifications

Hazardous Environments: UL Class 1 Division 2, ATEX Zone 2, IECEx
EMC: EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class A
Mechanical: IP66, NEMA 4X
Green Product: RoHS, cRoHS, WEEE

Warranty

Warranty Period: 3 years for computer system, 1 year for LCD panel
Details: See www.moxa.com/warranty

Software Specifications

Windows Embedded Standard 7

Core OS:
• 32-bit support
• Remote Client
• Remote Procedure Call
Applications and Services Development:
• .Net Framework 3.5
• Remote Desktop Protocol 7.1
• COM OLE Application Support
• COM+ Application Support
• MSMQ
Internet Services:
• Internet Explorer 8.0
• IIS 7.0
Diagnostics:
• Common Diagnostic Tools
• Problem Reports and Solutions
Fonts: Chinese (Trad. and Simp.), Japanese, Korean, Western, Middle Eastern, South East Asian, and South Asian Fonts
Graphics and Multimedia:
• MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
• MPEG Layer-3 Audio Codecs(MP3)
• MPEG4 Decoders
• Windows Media Video VC-1 (WMV) Codecs
• DirectX and Windows Device Experience
• Windows Media Player 12
International:
• IME Simplified Chinese Support
• IME Traditional Chinese Support
Management:
• Group Policy Management
• Windows Management Instrument (WMI)
• Windows Update
Networking:
• Extensible Authentication Protocol (EAP)
• Internet Authentication Service
• Telnet Server
• Bluetooth
• Domain Services
• Network Access Protection
• Network and Sharing Center
• Quality of Service
• Remote Access Service (RAS)
• Telephony API Client
• Windows Firewall
• Wireless Networking
Security:
• Credential Roaming Service
• Credentials and Certificate Management
• Windows Authorization Manager (AZMAN)
• Windows Security Center
• Active Directory Rights Management
• Security Base
• Encrypted File System (EFS)
Embedded Features:
• Enhanced Write Filter (EWF)
• File-Based Write Filter (FBWF)
• Message Box Default Reply
• Registry Filter
• WSDAPI for .NET
File Systems and Data Store:
• Windows Data Access Components
• Windows Backup and Restore
Embedded Self-Health Diagnostic Software: SNMP-based remote scripting layer for monitoring, reporting, and control

Ordering Information

Available Models

EXPC-1319-STS-W7E: Fanless rugged Zone 2 19-inch 1000-nit LCD panel computer, single point touchscreen, IP66, Atom D525 dual core 1.8 GHz CPU, -20 to 60°C operating temperature
EXPC-1319-STS-IHS-W7E: Fanless rugged Zone 2 19-inch 1000-nit LCD panel computer, single point touchscreen, IP66, Atom D525 dual core 1.8 GHz CPU, -40 to 60°C operating temperature, with Intelligent Heating Solution (IHS)
EXPC-1319-STS-FX-W7E: Fanless rugged Zone 2 19-inch 1000-nit LCD panel computer, single point touchscreen, IP66, optical fiber ports, Atom D525 dual core 1.8 GHz CPU, -20 to 60°C operating temperature
EXPC-1319-STS-IHS-FX-W7E: Fanless rugged Zone 2 19-inch 1000-nit LCD panel computer, single point touchscreen, IP66, optical fiber ports, Atom D525 dual core 1.8 GHz CPU, -40 to 60°C operating temperature, with Intelligent Heating Solution (IHS)

Package Checklist

- 1 EXPC-1319 panel computer
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- Waterproof USB connector pack x 2
- Waterproof DB9 connector pack x 2
- Waterproof LAN connector pack x 2
- Waterproof power connector pack x 1
- Wall-mounting kit
- Quick installation guide
- Documentation and software DVD
- Warranty card

Compact/Fanless Computers

Product Selection Guide

x86 Computers 26-2
RISC Computers 26-3

x86 Computers

V2403 Series: x86 embedded computer with Intel 3rd Gen Core-i CPU, HDMI, DVI, 2 LANs, 4 serial ports, 4 DIs, 4 DOs, 4 USB 2.0 ports, dual CFast slots, wireless enabled 26-4
V2201 Series: x86 embedded computer with Intel Atom E3800 CPU, HDMI, 2 LANs, 2 serial ports, 4 DIs, 4 DOs, 2 USB 2.0 and 1 USB 3.0 ports, mSATA, SD, wireless enabled 26-8

RISC Computers

UC-8416/8418 Series: RISC ready-to-run embedded computers with 8 serial ports, 3 LANs, DIOs, 8 switch ports, 2 CAN ports, USB, CompactFlash 26-12
UC-7101/7110/7112 Series: RISC ready-to-run embedded computers with 1 or 2 serial ports, dual LANs, SD. . . 26-16
UC-7122/7124 Series: RISC ready-to-run embedded computers with dual LANs, 2 or 4 serial ports, SD, USB . . . 26-20
IA260 Series: RISC-embedded computers with 4 serial ports, dual LANs, VGA, DIOs, CompactFlash, USB 26-23
IA240 Series: RISC-embedded computers with 4 serial ports, 4 DI and 4 DO channels, dual LANs, PCMCIA, SD . 26-26

x86 Computers

	V2403 Series	V2201 Series
Computer		
CPU	V2403-C2 Series: Intel® Celeron 1047UE (Dual Core, 2M Cache, 1.40 GHz) V2403-C3 Series: Intel® Core i3-3217UE (Dual Core, 2M Cache, 1.60 GHz) V2403-C7 Series: Intel® Core i7-3517UE (Dual Core, 4M Cache, 1.70 GHz)	V2201-E1 Series: Intel® Atom™ Processor E3815 (Single Core, 512K Cache, 1.46 GHz) V2201-E2 Series: Intel® Atom™ Processor E3826 (Dual Core, 1M Cache, 1.46 GHz) V2201-E4 Series: Intel® Atom™ Processor E3845 (Quad Core, 1M Cache, 1.91 GHz)
OS	Windows Embedded Standard 7 64-bit or Linux Debian 8 64-bit	Windows Embedded Standard 7 64-bit or Linux Debian 8 64-bit
System Memory	1 DDR3-1600 SDRAM slot, 4 GB pre-installed, 8 GB max.	1 DDR3 SO-DIMM slot (2 GB pre-installed for Linux models, 4 GB pre-installed for Windows models, 8 GB max.) • E3815 and E3826 support DDR3L-1066 • E3845 supports DDR3L-1333
USB	USB 2.0 hosts x 4, type A connectors	USB 3.0 hosts x 1, USB 2.0 hosts x 2, type A connectors
Storage		
CFast	1 removable CFast socket for OS storage, 1 internal CFast socket for OS backup	–
mSATA	1 internal mini-PCIe socket for storage expansion	1 internal mini-PCIe socket for OS storage
SD	–	1 SD 3.0 (SDHC/SDXC) socket for storage expansion
SSD/HDD	1 internal SATA-II connector for 2.5" SSD/HDD	–
Audio		
Input	Line-in interface (audio jack)	–
Output	Line-out interface (audio jack)	Line-out interface (together with HDMI)
Other Peripherals		
Expansion Slot	2 Mini-PCIe sockets • 1 USB signal, for Sierra Wireless 3G/LTE module • 1 USB + PCIe signal	2 Mini-PCIe sockets • 1 USB signal, for Sierra Wireless 3G/LTE module • 1 USB + PCIe signal
USIM	2 USIM slot	1 USIM slot
Display		
Graphics Controller	Intel® HD (integrated)	Intel® HD (integrated)
Connector Type	1 HDMI connector (type A), 1 DVI-I connector, 1 VGA connector (CV required)	1 HDMI connector (type A)
Display Interface	HDMI supports HDMI 1.4b, 1920 x 1200 resolution @ 60 Hz • DVI up to 1920x1200 resolution @ 60 Hz • VGA up to 1920x1200 resolution @ 60 Hz • VGA up to 2048x1536 resolution @ 75 Hz	Supports HDMI 1.4a, 1920 x 1080 pixels @ 60/24 Hz
Ethernet Interface		
LAN	Auto-sensing 10/100/1000 Mbps ports (RJ45) x 2	Auto-sensing 10/100/1000 Mbps ports (RJ45) x 2
Isolation Protection	1.5 kV	1.5 kV
Wireless SMA Interface		
Wi-Fi	2 SMA connectors	2 SMA connectors
3G/LTE	2 SMA connectors	2 SMA connectors
GPS	1 SMA connector	1 SMA connector
Serial Interface		
Serial Standards	RS-232/422/485 x 4 (DB9 male)	RS-232/422/485 x 2 (DB9 male)
Digital Input/Digital Output		
Input/Output Channels	DI x 4, DO x 4, sink type	DI x 4, DO x 4, sink type
Connector Type	10-pin screw-fastened Euroblock terminal	10-pin screw-fastened Euroblock terminal
Physical Characteristics		
Weight	2.247 kg (4.99 lb) or 2.168 kg (4.82 lb)	940 g (2.09 lb)
Dimensions	275 x 63 x 154 mm (10.83 x 2.47 x 6.06 in)	178 x 52.5 x 120.2 mm (7.01 x 2.07 x 4.73 in)
Mounting	DIN-rail, wall	DIN-rail, wall
Environmental Limits		
Operating Temperature	-40 to 70°C (-40 to 158°F)	-40 to 85°C (-40 to 185°F) or -40 to 70°C (-40 to 158°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Anti-Vibration	IEC 60068-2-64: 5 Grms, 5 Hz to 500 Hz, 1 hr/axis w/ mSATA, CFast, SSD	IEC 60068-2-64: 5 Grms, 5 Hz to 500 Hz, 1 hr/axis w/ mSATA, SD
Anti-Shock	IEC 60068-2-27: 50 g/11ms ±X, ±Y, ±Z, 3 shocks each axis w/ mSATA, CFast, SSD	IEC 60068-2-27: 100 g/11ms ±X, ±Y, ±Z, 3 shocks each axis w/ mSATA, SD
Power Requirements		
Input Voltage	9 to 36 VDC (3-pin terminal block for V+, V-, SG)	9 to 36 VDC (3-pin terminal block for V+, V-, SG)
Input Current	1.39 A @ 24 VDC	2 A @ 9 VDC
Power Consumption	31.59 W	18 W
Standards and Certifications		
Safety	UL 60950-1, CSA C22.2 No. 60950-1-03 (60950-1-07), EN 60950-1, UL 508	UL 60950-1, CSA C22.2 No. 60950-1-03 (60950-1-07), EN 60950-1, UL 508
EMC	EN 55022/24, EN 61000-6-2/6-4	EN 55022/24, EN 61000-6-2/6-4*
EMI	CISPR 22, FCC Part 15B Class A	CISPR 22, FCC Part 15B Class A
EMS	IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6 , IEC 61000-4-8	IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8
Green Product	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE
Warranty		
Warranty Period	3 years	3 years
Details	See www.moxa.com/warranty	See www.moxa.com/warranty
Page	26-4	26-8

RISC Computers

	UC-8416/8418 Series	UC-7101/7110/7112 Series	UC-7122/7124 Series	IA260 Series	IA240 Series
Computer					
CPU Speed	533 MHz	192 MHz	200 MHz	200 MHz	192 MHz
OS	Linux or Windows CE 6.0	µClinux or Linux	Windows CE 5.0	Linux or Windows CE 6.0	Linux
Expansion Bus	PCI/104 onboard	–	–	–	–
USB	USB 2.0 hosts x 2	–	USB 2.0 hosts x 1	USB 2.0 hosts x 2	USB 2.0 hosts x 1
DRAM	DDR2 SDRAM, 256 MB (512 MB max.)	UC-7101/7110/7112: 16 MB UC-7112 Plus: 32 MB	DDR2 SDRAM, 32 MB	DDR2 SDRAM, 128 MB	DDR2 SDRAM, 64 MB
Flash	• NOR Flash, 16 MB • NAND Flash, 32 MB	UC-7101/7110/7112: 8 MB UC-7112 Plus: 16 MB	NOR Flash, 16 MB	NOR Flash, 32 MB	NOR Flash, 16 MB
SRAM	256 KB, battery backup	–	–	–	–
Storage					
Storage Expansion	CompactFlash socket	SD slot (UC-7101, UC-7112, and UC-7112 Plus only)	SD slot	CompactFlash socket	SD slot
Display					
Display Interface	–	–	–	CRT interface for VGA output, DB15 female connector	–
Resolution	–	–	–	1024 x 768, 8 bits	–
Ethernet Interface					
LAN	10/100 Mbps ports x 2 (RJ45)	10/100 Mbps ports x 1 or 2 (RJ45)	10/100 Mbps ports x 2 (RJ45)	10/100 Mbps ports x 2 (RJ45)	10/100 Mbps ports x 2 (RJ45)
Switch Port	10/100 Mbps unmanaged ports (RJ45) x 8 (UC-8416)	–	–	–	–
Serial Interface					
Serial Standards	RS-232/422/485 x 8 (RJ45)	RS-232/422/485 x 1 or 2 (DB9 male)	RS-232/422/485 ports x 2 (DB9) or 4 (RJ45)	RS-232/422/485 ports x 4 (DB9 male)	RS-232/422/485 ports x 4 (RJ45)
Console Port	RS-232 (TxD, RxD, GND), 4-pin header output (115200, n, 8, 1)	RS-232 (TxD, RxD, GND) • UC-7101: 4-pin pin header output • UC-7110/7112: 3-wire pin-header	RS-232 (TxD, RxD, GND), 4-pin pin header output	RS-232 (TxD, RxD, GND), 4-pin header output (115200, n, 8, 1)	RS-232, RJ45 connector, supports PPP
Digital Input					
Input Channels	UC-8416: DI x 4 UC-8418: DI x 12	–		DI x 8	DI x 4
Connector Type	10-pin screw-fastened terminal block (4 points, COM, GND)			10-pin screw-fastened terminal block (8 points, COM, GND)	–
Digital Output					
Output Channels	UC-8416: DO x 4, sink type UC-8418: DO x 12, sink type	–	–	DO x 8, sink type	DO x 4
Connector Type	10-pin screw-fastened terminal block (4 points, GND)	–	–	9-pin screw-fastened terminal block	–
Physical Characteristics					
Weight	1 kg (2.22 lb)	• UC-7101: 130 g (0.29 lb) • UC-7110/7112: 190 g (0.42 lb)	UC-7122: 190 g (0.42 lb) UC-7124: 200 g (0.44 lb)	1 kg (2.22 lb)	430 g (0.96 lb)
Dimensions	200 x 57 x 120 mm (7.87 x 2.24 x 4.72 in)	• UC-7101: 67 x 22 x 100.4 mm (2.64 x 0.87 x 3.95 in) • UC-7110/7112: 77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)	77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)	52 x 112.6 x 162 mm (2.05 x 4.43 x 6.38 in)	60 x 137 x 100 mm (2.36 x 5.39 x 3.94 in)
Environmental Limits					
Operating Temperature	-10 to 60°C (14 to 140°F) or -40 to 75°C (-40 to 167°F)	-10 to 60°C (14 to 140°F) or -40 to 75°C (-40 to 167°F)	-10 to 60°C (14 to 140°F) or -40 to 75°C (-40 to 167°F)	-10 to 60°C (14 to 140°F) or -40 to 75°C (-40 to 167°F)	-10 to 60°C (14 to 140°F) or -40 to 75°C (-40 to 167°F)
Storage Temperature	-20 to 75°C (-4 to 167°F) or -40 to 85°C (-40 to 185°F)	-20 to 75°C (-4 to 167°F) or -40 to 85°C (-40 to 185°F)	-20 to 75°C (-4 to 167°F) or -40 to 85°C (-40 to 185°F)	-20 to 75°C (-4 to 167°F) or -40 to 85°C (-40 to 185°F)	-20 to 75°C (-4 to 167°F) or -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Anti-Vibration	2 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis	1 g @ IEC-68-2-6, sine wave (resonance search), 5-500 Hz, 1 Oct/min, 1 cycle, 13 min 17 sec per axis (UC-7101/7110 only)	1 g @ IEC-68-2-6, sine wave (resonance search), 5-500 Hz, 1 Oct/min, 1 cycle, 13 min 17 sec per axis	2 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis	1 g @ IEC-68-2-6, sine wave (resonance search), 5-500 Hz, 1 Oct/min, 1 cycle, 13 min 17 sec per axis
Anti-Shock	20 g @ IEC-68-2-27, half sine wave, 11 ms	–	–	20 g @ IEC-68-2-27, half sine wave, 11 ms	–
Power Requirements					
Input Voltage	12 to 48 VDC (3-pin terminal block)	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC (3-pin terminal block)	12 to 48 VDC
Input Current	• 310 mA @ 48 VDC • 625 mA @ 24 VDC • 1350 mA @ 12 VDC	• 170 mA @ 24 VDC • 340 mA @ 12 VDC	• 170 mA @ 24 VDC • 340 mA @ 12 VDC	• 450 mA @ 24 VDC • 900 mA @ 12 VDC	• 300 mA @ 24 VDC • 600 mA @ 12 VDC
Power Consumption	15 W	4.5 W	UC-7122: 4.1 W UC-7124: 4.3 W	5.8 W/11 W	7 W
Standards and Certifications					
Safety	UL 60950-1, EN 60950-1, CCC (GB9254, GB17625.1)	• UC-7101: UL 60950, CSA-C22.2 No. 60950-1, EN 60950-1 • UC-7110/7112: UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1	UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1	UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1, CCC (GB4943, GB9254, GB17625.1)	UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1
EMC	FCC Part 15 Subpart B Class A	FCC Part 15 Subpart B Class A	FCC Part 15 Subpart B Class A	FCC Part 15 Subpart B Class A	FCC Part 15 Subpart B Class A
EMI	–	–	–	–	–
EMS	IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11				
Green Product	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE
Warranty					
Warranty Period	5 years	5 years	5 years	5 years	5 years
Details	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty
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V2403 Series

Fanless, rugged, ready-to-go x86 Industrial IoT embedded computer

- Intel Core-i series processor with three performance options
- -40 to 70°C (system+LTE) operating temperature
- Dual CFast sockets for storing OS and OS backup
- Triple mini-PCIe sockets for storage and wireless modules; supports mSATA, Wi-Fi, 3G, LTE, GPS, and Bluetooth
- Variety of interfaces: 4 serial ports, 2 Ethernet LAN ports, 4 DIs, 4 DOs, USB, HDMI, wireless
- EN 61000-6-2 and EN 61000-6-4 certification; meets EMC standard for heavy industry
- Up to 5 Grms anti-vibration and 100-g anti-shock
- Ready-to-run Debian 8 and Windows Embedded Standard 7 platforms
- Moxa Proactive Monitoring utility for system hardware health monitoring
- Moxa Smart Recovery utility to recover system from boot failure (W7E only)

Overview

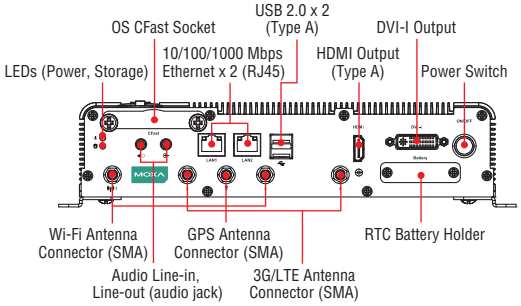
The Moxa V2403 series fanless x86 embedded computer is based on the Intel® 3rd gen Core-i™ series processor, features the most reliable I/O design to maximize connectivity, and supports dual wireless modules, making it suitable for a diverse range of communication applications. The computer's thermal design ensures reliable system operation in temperatures ranging from -40 to 70°C (with a special purpose Moxa wireless module installed). The V2403 series supports "Moxa Proactive Monitoring" for device I/O status monitoring and alerts, system temperature monitoring and alerts, and system power management. Monitoring system status closely makes it easier to recover from errors and provides the most reliable platform for your applications.

Applications:

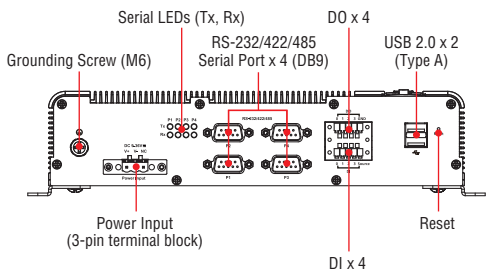
- Remote Terminal Unit (RTU)
- Data acquisition
- M2M communication (smart gateway)
- Digital signage
- Factory automation
- In-vehicle monitor/data logger (transportation)
- Programmable router
- Energy usage optimization
- Predictive maintenance
- Asset management

Appearance

Front View



Rear View



Hardware Specifications

Computer
CPU:
V2403-C2 Series: Intel® Celeron 1047UE (Dual Core, 2M Cache, 1.40 GHz)
V2403-C3 Series: Intel® Core i3-3217UE (Dual Core, 3M Cache, 1.60 GHz)
V2403-C7 Series: Intel® Core i7-3517UE (Dual Core, 4M Cache, 1.70 GHz)
OS: Windows Embedded Standard 7 64-bit or Linux Debian 8 64-bit
System Memory: 1 DDR3-1600 SDRAM slot, 8 GB max.
USB: USB 2.0 hosts x 4, type A connectors, supporting system boot up

Storage
CFast : 1 removable CFast socket for OS storage, 1 internal CFast socket for OS backup
mSATA: 1 internal mini-PCIe socket for storage expansion
SSD/HDD: 1 internal SATA-II connector for 2.5" SSD/HDD

Audio
Input: Line-in interface (audio jack)
Output: Line-out interface (audio jack)

Wireless Peripherals
Expansion Slot: 2 Mini-PCIe sockets
• 1 USB signal, for Sierra Wireless 3G/LTE module
• 1 USB + PCIe signal
USIM: 2 USIM slots

Display
Graphics Controller: Intel® HD (integrated)
Connector Type: 1 HDMI connector (type A), 1 DVI-I connector, 1 VGA connector (CV required)
Display Interface: HDMI supports HDMI 1.4b, 1920 x 1200 resolution @ 60 Hz
• DVI up to 1920x1200 resolution @ 60 Hz
• VGA up to 1920x1200 resolution @ 60 Hz
• VGA up to 2048x1536 resolution @ 75 Hz

Ethernet Interface
LAN: Auto-sensing 10/100/1000 Mbps ports (RJ45) x 2
Isolation Protection: 1.5 kV

Wireless SMA Interface
Wi-Fi: 2 SMA connectors
3G/LTE: 2 SMA connectors
GPS: 1 SMA connector

Serial Interface
Serial Standards: RS-232/422/485 software selectable ports (DB9 male) x 4

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 kbps

Serial Signals
RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Digital Input
Input Channels: DI x 4
Input Voltage: 0 to 30 VDC at 25 Hz
Digital Input Levels for Dry Contacts:
Logic level 0: Close to GND
Logic level 1: Open
Digital Input Levels for Wet Contacts:
Logic level 1: +3 V max
Logic level 0: +10 V to +30 V (Source to DI)
Connector Type: 10-pin screw-fastened Euroblock terminal
Isolation: 3 kV optical isolation

Digital Output
Output Channels: DO x 4, sink type
Output Current: Max. 200 mA per channel
On-State Voltage: 24 VDC nominal, open collector to 30 VDC
Connector Type: 10-pin screw-fastened Euroblock terminal
Isolation: 3 kV optical isolation

LEDs
System: Power
Storage: CFast/SSD/HDD/mSATA
LAN: 2 LEDs per port (10/100/1000 Mbps)
Serial: 2 LEDs per port (Tx and Rx)

Switches and Buttons
Power Switch: on/off
Reset Button: System reset

Physical Characteristics
Housing: Aluminum
Weight:
"-W" Models: 2.247 kg (4.99 lb)
non "-W" Models: 2.168 kg (4.82 lb)
Dimensions:
Without ears: 250 x 57 x 154 mm (9.84 x 2.23 x 6.06 in)
With ears: 275 x 63 x 154 mm (10.83 x 2.47 x 6.06 in)
Mounting: DIN rail, wall

Environmental Limits
Operating Temperature:
Standard models: -40 to 70°C (-40 to 158°F), with Moxa recommended wireless modules (3G/LTE + Wi-Fi) installed
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: IEC 60068-2-64: 5 Grms, 5 Hz to 500 Hz, 1 hr/axis w/ mSATA, CFast, SSD
Anti-Shock: IEC 60068-2-27: 50 g/11ms ±X, ±Y, ±Z, 3 shocks each axis w/ mSATA, CFast, SSD

Power Requirements
Input Voltage: 9 to 36 VDC (3-pin terminal block for V+, V-, SG)
Input Current:
• 3.51 A @ 9 VDC
• 1.39 A @ 24 VDC
• 0.93 A @ 36 VDC
Power Consumption: 34 W

Standards and Certifications
Safety: UL 60950-1, CSA C22.2 No. 60950-1-03 (60950-1-07), EN 60950-1, UL 508
EMC: EN 55022/24, EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 1 kV
IEC 61000-4-8
Green Product: RoHS, CRoHS, WEEE

Reliability
Automatic Reboot Trigger: Software-programmable watchdog timer configurable from 1 to 255 seconds

MTBF (mean time between failures)

Time:
V2403-C2-W-T/V2403-C3-W-T /V2403-C7-W-T: 335,810 hrs
V2403-C2-T/V2403-C3-T/V2403-C7-T: 358,958 hrs
V2403-C2-T-W7E/V2403-C2-T-LX: 329,398 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

Warranty Period: 3 years
Details: See www.moxa.com/warranty
Note: These hardware specifications describe the embedded computer unit itself, but not its official accessories. In particular, the wide temperature specification does not apply to accessories such as power adapters and cables.

Software Specifications

Linux

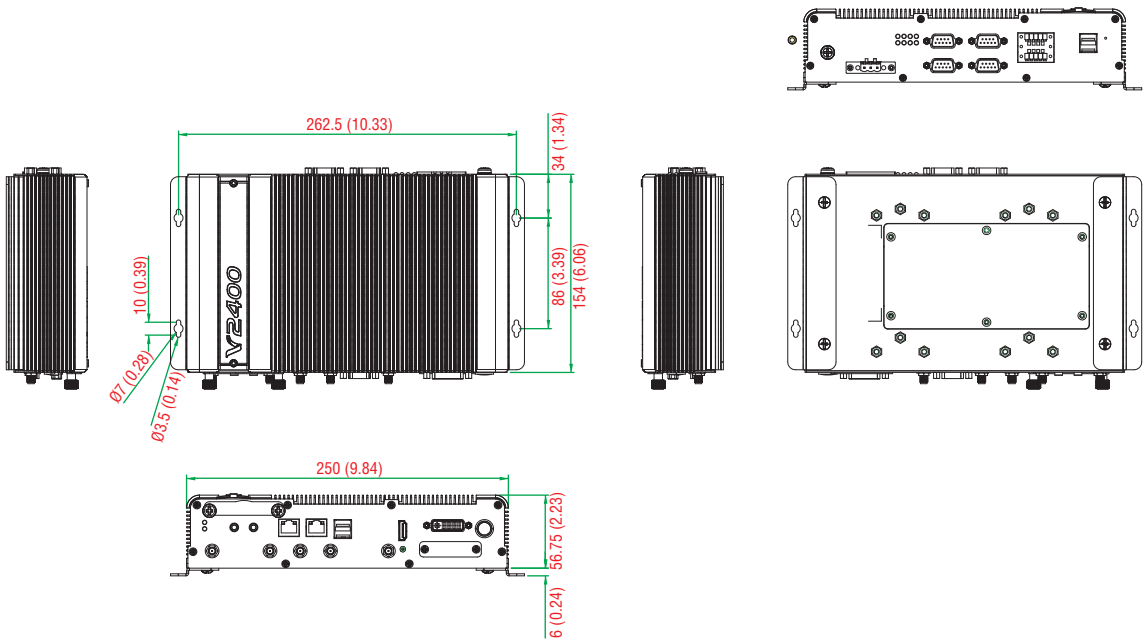
OS: Linux Debian 8 64-bit
Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML
Terminal Server (SSH): Provides secure encrypted communications between two unsecure hosts over an unsecure network
Kernel Version: GNU/Linux 3.16
System Shell: DASH (default), BASH
Text Editor: vim
File System: ext4
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv2, ICMP, ARP, HTTP, ICMP, ARP, DHCP, NTP, NFS, SSH, SFTP, RSYNC, SSL
Internet Security Suite: OpenVPN, IPTables Firewall
Cellular Networking: QMI (Qualcomm MSM Interface): Glib-based library for talking to WWAN modems and devices that speak the Qualcomm MSM Interface (QMI) protocol.
Watchdog: A watchdog timer that triggers a system reset upon software freezes, for both specific applications and system-wide failures.
Application Development Software:
• Moxa API Library
• GNU C library
• Perl
Embedded Self-Health Maintenance Software: Moxa Proactive Monitoring
Security Update of Existing Software Packages: All software packages installed on the V2403 can be automatically updated using Debian Linux's Advanced Packaging Tool (APT) server or Moxa's server.

Windows Embedded Standard 7

Core OS:
• 64-bit support
• Remote Client
• Remote Procedure Call
Applications and Services Development:
• Remote Desktop Protocol 7.1
• COM OLE Application Support
• COM + Application Support
• MSMQ
Internet Services:
• Internet Explorer 8.0
• IIS 7.0
Diagnostics:
• Common Diagnostic Tools
• Problem Reports and Solutions
Fonts: Western, Middle Eastern, South East Asian, and South Asian
Graphics and Multimedia:
• MPEG Layer-3 Audio Codecs (MP3)
• MPEG4 Decoders
• DirectX and Windows Device Experience
Management:
• Group Policy Management
• Windows Management Instrument (WMI)
• Windows Update
Networking:
• Extensible Authentication Protocol (EAP)
• Internet Authentication Service
• Telnet Server
• Bluetooth
• Domain Services
• Network Access Protection
• Network and Sharing Center
• Quality of Service
• Remote Access Service (RAS)
• Telephony API Client
• Windows Firewall
• Wireless Networking
Security:
• Credential Roaming Service
• Credentials and Certificate Management
• Windows Authorization Manager (AZMAN)
• Windows Security Center
• Active Directory Rights Management
• Security Base
• Encrypted File System (EFS)
Embedded Features:
• Enhanced Write Filter (EWF)
• File-Based Write Filter (FBWF)
• Registry Filter
• WSDAPI for .NET
File Systems and Data Store:
• Windows Data Access Components
• Windows Backup and Restore
Maintenance: Moxa Proactive Monitoring and Moxa Smart Recovery

Dimensions

Unit: mm (inch)



Ordering Information

Pre-Configured Models																			
Model Name	CPU	RAM	OS CFast	OS	Backup Cfast	Internal SSD/HDD		mSATA	HDMI	DVI-I	LAN	Serial	DI/O	USB 2.0	Expansion Socket	Wireless Connector	LTE Heat Sink	Operating Temp.	LTE Operating Temp.
						Bracket	Storage												
V2403-C2-T-LX	1047UE	4 GB	8 GB	Debian 8	–	–	–	–	1	1	2	4	4/4	4	–	–	–	-40 to 70°C	–
V2403-C2-T-W7E	1047UE	4 GB	8 GB	W7E	–	–	–	–	1	1	2	4	4/4	4	–	–	–	-40 to 70°C	–

CTO Models, Default (optional)																			
	Must select for system to work																		
Model Name	CPU	RAM*	OS CFast*	OS*	Backup CFast*	Internal SSD/HDD		mSATA*	HDMI	DVI-I	LAN	Serial	DI/O	USB 2.0	Expansion Socket	Wireless Connector	LTE Heat Sink	Operating Temp.	LTE Operating Temp.
						Bracket*	Storage*												
V2403-C2-T	1047UE	4 GB (2, 8 GB)	N/A (8, 16, 32 GB)	N/A (Debian 8 & W7E)	N/A (8, 16, 32 GB)	N/A (Enable)	N/A (0.5, 1, 2 TB)	–	1	1	2	4	4/4	4	–	–	–	-40 to 70°C	–
V2403-C3-T	3217UE							–	1	1	2	4	4/4	4	–	–	–	-40 to 70°C	–
V2403-C7-T	3517UE							–	1	1	2	4	4/4	4	–	–	–	-40 to 70°C	–
V2403-C2-W-T	1047UE					–	–	N/A (8, 16, 32, 64 GB)	1	1	2	4	4/4	4	2	5	1	-40 to 70°C	-40 to 70°C
V2403-C3-W-T	3217UE					–	–		1	1	2	4	4/4	4	2	5	1	-40 to 70°C	-40 to 70°C
V2403-C7-W-T	3517UE					–	–		1	1	2	4	4/4	4	2	5	1	-40 to 70°C	-40 to 70°C

*CTO = Configured To Order

Note:

Refer to the Component Compatibility Guide (CCG) for the list of components that Moxa has validated to be compatible with this product. You can download the CCG from the Moxa product website. For components with a Moxa P/N, you can order the components together with your product from Moxa and we will install the selected components in your product. Moxa guarantees the compatibility of the components installed in CTO products.

Package Checklist

- V2403 embedded computer
- Terminal block to power jack converter
- Wall-mounting kit
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

V2201 Series

Fanless, ultra-compact, rugged x86 IIoT embedded computer

- Intel Atom E3800 series processor with three performance options
- -40 to 85°C system operating temperature (-40 to 70°C with LTE module installed)
- Dual mini-PCIe sockets for wireless modules, supports W-iFi, 3G, LTE, GPS, and Bluetooth
- Variety of interfaces: 2 serial ports, 2 Ethernet LAN port, 4 DIs, 4 DOs, SD, USB, HDMI, wireless
- EN 61000-6-2 and EN 61000-6-4 certification*; meets EMC standard for heavy industry
- Up to 5 Grms anti-vibration and 100-g anti-shock
- Ready-to-run Debian 8 and Windows Embedded Standard 7 platforms
- Moxa Proactive Monitoring utility for system hardware health monitoring
- Moxa Smart Recovery utility to recover system from boot failure (W7E only)

*Passed with AC/DC adapter.

Overview

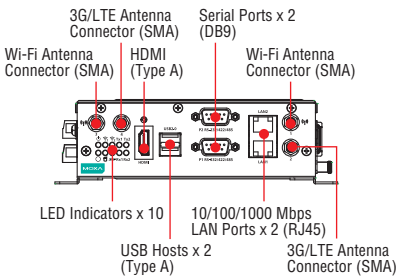
The Moxa V2201 series ultra-compact x86 embedded computer is based on the Intel® Atom™ E3800 series processor, features the most reliable I/O design to maximize connectivity, and supports dual wireless modules, making it suitable for a diverse range of communication applications. The computer's thermal design ensures reliable system operation in temperatures ranging from -40 to 85°C (-40 to 70°C with a special purpose Moxa wireless module installed). The V2201 series supports "Moxa Hardware Monitoring" for device I/O status monitoring and alerts, system temperature monitoring and alerts, and system power management. Monitoring system status closely makes it easier to recover from errors and provides the most reliable platform for your applications.

Applications:

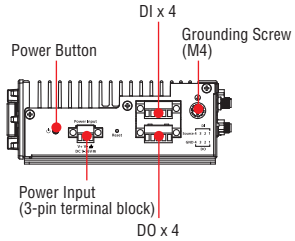
- Remote Terminal Unit (RTU)
- Data acquisition
- M2M communication (smart gateway)
- Digital signage
- Factory automation
- In-vehicle monitor/data logger (transportation)
- Programmable router
- Energy usage optimization
- Predictive maintenance
- Asset management

Appearance

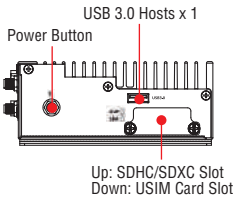
Front View



Left Side View



Right Side View



Hardware Specifications

Computer
CPU:
V2201-E1 Series: Intel® Atom™ Processor E3815 (Single Core, 512K Cache, 1.46 GHz)
V2201-E2 Series: Intel® Atom™ Processor E3826 (Dual Core, 1M Cache, 1.46 GHz)
V2201-E4 Series: Intel® Atom™ Processor E3845 (Quad Core, 1M Cache, 1.91 GHz)
OS: Windows Embedded Standard 7 64-bit or Linux Debian 8 64-bit
System Memory: 1 DDR3 SO-DIMM slot, 8 GB max.
• E3815 and E3826 support DDR3L-1066
• E3845 supports DDR3L-1333
USB: 1 bootable USB 3.0 port, 2 bootable USB 2.0 ports (type A)

Storage
mSATA: 1 internal mini-PCIe socket for OS storage
SD: 1 SD 3.0 (SDHC/SDXC) socket for storage expansion*
*W7E only supports SD 2.0

Audio
Output: Line-out interface (together with HDMI)

Other Peripherals
Expansion Slot: 2 Mini-PCIe sockets
• 1 USB signal, for Sierra Wireless 3G/LTE module
• 1 USB + PCIe signal
USIM: 1 USIM slot

Display
Graphics Controller: Intel® HD (integrated)
Connector Type: 1 HDMI connector (type A)
Display Interface: Supports HDMI 1.4a, 1920 x 1080 pixels @ 60/24 Hz

Ethernet Interface
LAN: Auto-sensing 10/100/1000 Mbps ports (RJ45) x 2
Isolation Protection: 1.5 kV

Wireless SMA Interface
Wi-Fi: 2 SMA connectors
3G/LTE: 2 SMA connectors
GPS: 1 SMA connector

Serial Interface
Serial Standards: RS-232/422/485 software selectable ports (DB9 male) x 2

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
Baudrate: 50 bps to 115.2 kbps

Serial Signals
RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Digital Input
Input Channels: DI x 4
Input Voltage: 0 to 30 VDC at 25 Hz
Digital Input Levels for Dry Contacts:
Logic level 0: Close to GND
Logic level 1: Open
Digital Input Levels for Wet Contacts:
Logic level 1: +3 V max.
Logic level 0: +10 V to +30 V (Source to DI)
Connector Type: 10-pin screw-fastened Euroblock terminal
Isolation: 3 kV optical isolation

Digital Output
Output Channels: DO x 4, sink type
Output Current: Max. 200 mA per channel
On-State Voltage: 24 VDC nominal, open collector to 30 VDC
Connector Type: 10-pin screw-fastened Euroblock terminal
Isolation: 3 kV optical isolation

LEDs
System: Power, user-defined
Storage: mSATA, SD
LAN: 2 LEDs per port (100/1000 Mbps)
Serial: 2 LEDs per port (Tx and Rx)
Wireless: Mini-PCIe 1, Mini-PCIe 2

Switches and Buttons
Power Switch: on/off (left-side panel)
Reset Button: For warm reboot (left-side panel)

Physical Characteristics
Housing: Aluminum
Weight: 940 g (2.09 lb)
Dimensions:
Without ears: 150 x 48.8 x 120.2 mm (5.91 x 1.92 x 4.73 in)
With ears: 178 x 52.5 x 120.2 mm (7.01 x 2.07 x 4.73 in)
Mounting: DIN rail, wall

Environmental Limits
Operating Temperature:
• E1/E2 models: -40 to 85°C (-40 to 185°F)
• E4 models: -40 to 70°C (-40 to 158°F)
• E1-W/E2-W/E4-W models with Moxa recommended wireless modules (3G/LTE + Wi-Fi) installed: -40 to 70°C (-40 to 158°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: IEC 60068-2-64: 5 Grms, 5 Hz to 500 Hz, 1 hr/axis w/ mSATA, SD
Anti-Shock: IEC 60068-2-27: 100 g/11 ms ±X, ±Y, ±Z, 3 shocks each axis w/ mSATA, SD

Power Requirements
Input Voltage: 9 to 36 VDC (3-pin terminal block for V+, V-, SG)
Input Current: 2 A @ 9 VDC
Power Consumption: 18 W

Standards and Certifications
Safety: UL 60950-1, CSA C22.2 No. 60950-1-03 (60950-1-07), EN 60950-1, UL 508
EMC: EN 55022/24, EN 61000-6-2/6-4*
*Passed with AC/DC adapter.
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Green Product: RoHS, CRoHS, WEEE

Reliability
Automatic Reboot Trigger: Software-programmable watchdog timer configurable from 1 to 255 seconds

MTBF (mean time between failures)
Time: 408,275 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty
Warranty Period: 3 years
Details: See www.moxa.com/warranty
Note: These hardware specifications describe the embedded computer unit itself, but not its official accessories. In particular, the wide temperature specification does not apply to accessories such as power adapters and cables.

Software Specifications

Linux

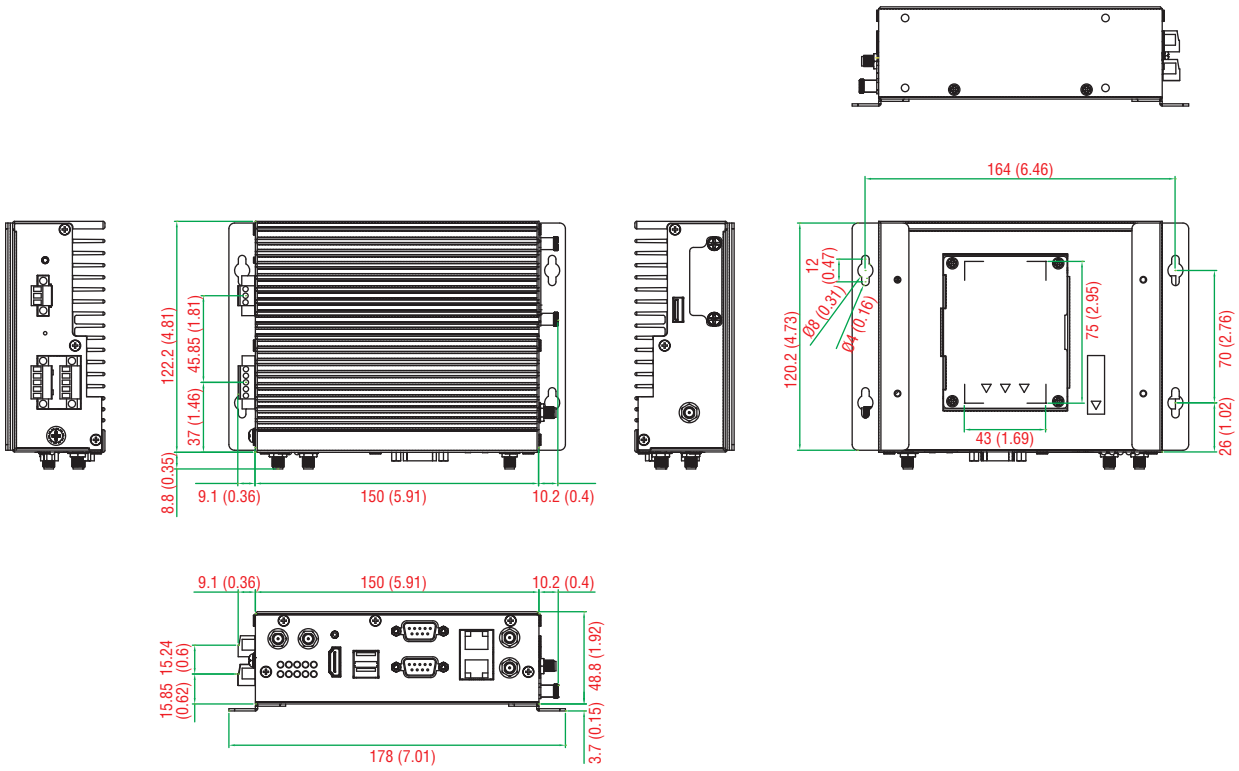
OS: Linux Debian 8 64-bit
Terminal Server (SSH): Provides secure encrypted communications between two untrusted hosts over an unsecure network
File System: EXT2, EXT3, EXT4
Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv2, ICMP, ARP, HTTP, CHAP,PAP,DHCP, NTP,NFS, SSH, PPP, SFTP, RSYNC, SSL
Internet Security: OpenVPN, IPTables
Secure Shell for Remote Access: SSH allows remote logins to a secure encrypted console from any connected network
Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Linux standard API)
Embedded Self-Health Maintenance Software: Moxa Proactive Monitoring

Windows Embedded Standard 7

Core OS:
• 64-bit support
• Remote Client
• Remote Procedure Call
Applications and Services Development:
• Remote Desktop Protocol 7.1
• COM OLE Application Support
• COM+ Application Support
• MSMQ
Internet Services:
• Internet Explorer 8.0
• IIS 7.0
Diagnostics:
• Common Diagnostic Tools
• Problem Reports and Solutions
Fonts: Western, Middle Eastern, South East Asian, and South Asian
Graphics and Multimedia:
• MPEG Layer-3 Audio Codecs (MP3)
• MPEG4 Decoders
• DirectX and Windows Device Experience
Management:
• Group Policy Management
• Windows Management Instrument (WMI)
• Windows Update
Networking:
• Extensible Authentication Protocol (EAP)
• Internet Authentication Service
• Telnet Server
• Bluetooth
• Domain Services
• Network Access Protection
• Network and Sharing Center
• Quality of Service
• Remote Access Service (RAS)
• Telephony API Client
• Windows Firewall
• Wireless Networking
Security:
• Credential Roaming Service
• Credentials and Certificate Management
• Windows Authorization Manager (AZMAN)
• Windows Security Center
• Active Directory Rights Management
• Security Base
• Encrypted File System (EFS)
Embedded Features:
• Enhanced Write Filter (EWF)
• File-Based Write Filter (FBWF)
• Registry Filter
• WSDAPI for .NET
File Systems and Data Store:
• Windows Data Access Components
• Windows Backup and Restore
Maintenance: Moxa Proactive Monitoring and Moxa Smart Recovery

Dimensions

Unit: mm (inch)



Ordering Information

Pre-Configured Models

	Must select for system to work														
Model Name	CPU	RAM	mSATA	OS	SD	HDMI	LAN	Serial	DI/O	USB 3.0/2.0	USIM slot	Expansion Socket	Wireless Connector	LTE Heat Sink	Operating Temp.	LTE Operating Temp.
V2201-E1-T-LX	E3815	2 GB	8 GB	Debian 8	–	1	2	2	4/4	1/2	1	2	–	–	-40 to 85°C	–
V2201-E1-T-W7E	E3815	4 GB	8 GB	W7E	–	1	2	2	4/4	1/2	1	2	–	–	-40 to 85°C	–

CTO Models

	Must select for system to work														
Model Name	CPU	RAM (CTO*)	mSATA (CTO*)	OS (CTO*)	SD (CTO*)	HDMI	LAN	Serial	DI/O	USB 3.0/2.0	USIM slot	Expansion Socket	Wireless Connector	LTE Heat Sink	Operating Temp.	LTE Operating Temp.
V2201-E1-T	E3815	Default 4 GB (2 or 8 GB optional)	Default 8 GB (16 or 32 GB optional)	Default N/A (Debian 8 or W7E optional)	Default N/A (8, 16, 32, or 64 GB optional)	1	2	2	4/4	1/2	1	2	–	–	-40 to 85°C	–
V2201-E2-T	E3826					1	2	2	4/4	1/2	1	2	–	–	-40 to 85°C	–
V2201-E4-T	E3845					1	2	2	4/4	1/2	1	2	–	–	-40 to 70°C	–
V2201-E1-W-T	E3815					1	2	2	4/4	1/2	1	2	5	1	-40 to 85°C	-40 to 70°C
V2201-E2-W-T	E3826					1	2	2	4/4	1/2	1	2	5	1	-40 to 85°C	-40 to 70°C
V2201-E4-W-T	E3845					1	2	2	4/4	1/2	1	2	5	1	-40 to 70°C	-40 to 70°C

*CTO = Configured To Order

Note:

Refer to the Component Compatibility Guide (CCG) for the list of components that Moxa has validated to be compatible with this product. You can download the CCG from the Moxa product website. For components with a Moxa P/N, you can order the components together with your product from Moxa and we will install the selected components in your product. Moxa guarantees the compatibility of the components installed in CTO products.

Package Checklist

- V2201 embedded computer
- Terminal block to power jack converter
- Wall-mounting kit
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

UC-8416/8418 Series

RISC ready-to-run embedded computers with 8 serial ports, 3 LANs, DIOs, 8 switch ports, 2 CAN ports, USB, CompactFlash

- Intel XScale IXP435 533 MHz processor
- 8 RS-232/422/485 serial ports
- 2 CAN-bus ports (UC-8418)
- 8 unmanaged-switch ports (UC-8416)
- 12 digital input and 12 digital output channels (UC-8418)
- 3 10/100 Mbps Ethernet ports
- 2 USB 2.0 hosts for mass storage devices
- Supports IPv6 function (Linux model only)
- DIN-rail or wall-mounting installation
- Robust, fanless design
- -40 to 75°C wide temperature model available
- Ready-to-run Embedded Linux or Windows CE 6.0

Overview

The UC-8416/8418 series embedded computers come with 8 RS-232/422/485 serial ports, 3 Ethernet ports, 2 CAN ports, 8 Ethernet ports, 12 digital input channels, 12 digital output channels, a CompactFlash socket, and 2 USB 2.0 hosts.

The computers use the Intel XScale IXP435 533 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but will not generate too much heat. The built-in 16 MB NOR Flash ROM and 256 MB SDRAM give you enough memory to run your application software directly on the UC-8418, and the 32 MB NAND Flash can be used to provide additional data storage. Moreover, the 256 KB SRAM offers a better data retention mechanism for avoiding data loss. These computers come with various communication interfaces, such as serial ports, Ethernet ports, CAN ports, and digital input/output channels, making them ideal as a communication platform for industrial applications that require network and device communications.

The UC-8416/8418 Series comes with the Linux 2.6 or Windows CE 6.0 platform pre-installed to provide an open software operating system for software program development. Software written for a desktop PC can be easily ported to the UC-8416/8418 Series platform by using a common compiler, without needing to modify the code. making these computers an optimal solution for use with industrial applications, but with minimal cost and effort.

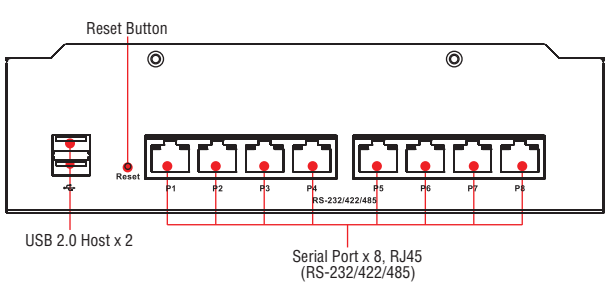
In addition to the standard model, a -40 to 75°C wide temperature model is also available for harsh industrial environments.

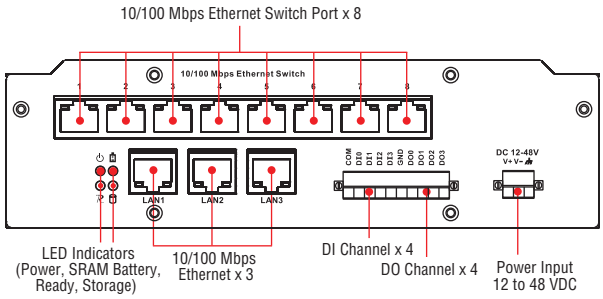
Appearance

Front View

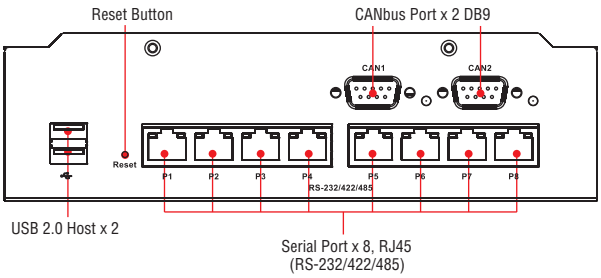
Rear View

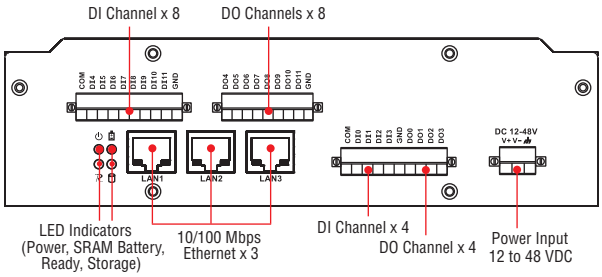
UC-8416





UC-8418





Hardware Specifications

Computer
CPU: Intel XScale IXP435, 533 MHz
Expansion Bus: PCI/104 onboard
USB: USB 2.0 hosts x 2, type A connectors
DRAM: DDR2 SDRAM, 256 MB (512 MB max.)
Flash:
• NOR Flash, 16 MB to sore OS (32 MB max. on CV request)
• NAND Flash, 32 MB to store data
OS (pre-installed): Linux
SRAM: 256 KB, battery backup

Storage
Storage Expansion: CompactFlash socket

Ethernet Interface
LAN: Auto-sensing 10/100 Mbps ports (RJ45) x 3
Switch Port: 10/100 Mbps unmanaged-switch ports (RJ45) x 8 (UC-8416)
Magnetic Isolation Protection: 1.5 kV, built-in

Serial Interface
Serial Standards: RS-232/422/485 software-selectable ports (8-pin RJ45) x 8
Console Port: RS-232 (TxD, RxD, GND), 4-pin header output (115200, n, 8, 1)

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 kbps (supports nonstandard baudrates; see user's manual for details)

Serial Signals
RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Digital Input
Input Channels:
UC-8416: DI x 4
UC-8418: DI x 12
Input Voltage: 0 to 30 VDC
Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open
Digital Input Levels for Wet Contacts:
• Logic level 0: +3 V max.
• Logic level 1: +10 V to +30 V (COM to DI)
Connector Type: 10-pin screw-fastened terminal block (4 points, COM, GND)
Isolation: 3 kV optical isolation

Digital Output
Output Channels: UC-8416: DO x 4, sink type
UC-8418: DO x 12, sink type
Output Current: Max. 200 mA per channel
On-State Voltage: 24 VDC nominal, open collector to 30 V
Connector Type: 10-pin screw-fastened terminal block (4 points, GND)
Isolation: 3 kV optical isolation

CANbus Communication (UC-8418 only)
Interface: Dual optically-isolated CAN2.0A/2.0B compliant ports
CAN Controller: Phillips SJA1000T
Signals: CAN_H, CAN_L
Isolation: 2 kV digital isolation
Speed: 10 kbps to 1 Mbps
Connector Type: DB9 male

LEDs
System: Power, Ready, Storage, Battery for SRAM
LAN: 10M/Link x 2, 100M/Link x 2 (on connector)
Serial: TxD x 8, RxD x 8
Reset Button: Supports "Reset to Factory Default"

Physical Characteristics
Housing: SECC sheet metal (1 mm)
Weight: 1 kg (2.22 lb)
Dimensions: 200 x 57 x 120 mm (7.87 x 2.24 x 4.72 in)
Mounting: DIN rail, wall

Environmental Limits
Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature:
Standard Models: -20 to 75°C (-4 to 167°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: 2 Grms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis
Anti-Shock: 20 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements
Input Voltage: 12 to 48 VDC (3-pin terminal block)
Input Current:
• 310 mA @ 48 VDC
• 625 mA @ 24 VDC
• 1350 mA @ 12 VDC
Power Consumption: 15 W

Standards and Certifications
Safety: UL 60950-1, EN 60950-1, CCC (GB9254, GB17625.1)
EMC: EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class B

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)

Time:
• UC-8416: 156,942 hrs
• UC-8418: 149,140 hrs
Standard: Telcordia (Bellcore) Standard

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty
Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adapter and cables.

Software Specifications

Linux

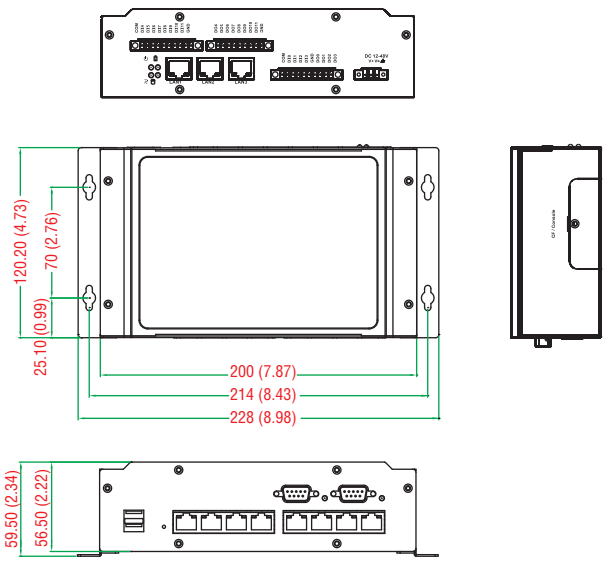
OS: Linux 3.8.13
Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML
Terminal Server (SSH): Provides secure encrypted communications between two untrusted hosts over an unsecure network
File System: JFFS2, NFS, Ext2, Ext3
Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, IPTables Firewall
Dial-up Networking: PPP Daemon (pppd) for Linux that uses the PPP protocol and allows Unix machines to connect to the Internet as PPP servers or clients, through dialup. The PPP Daemon Works with chat, dip, and diald programs among others, and supports the IP, TCP, UDP, and IPX for Linux (Novell) protocols.
Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)
Application Development Software:
• Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
• GNU C/C++ cross-compiler
• GNU C library
• GDB source-level debugging server
Software Protection: Encryption tool for user executable files (based on patented Moxa technology)

Windows Embedded CE 6.0

OS: Windows Embedded CE 6.0
File System: FAT
Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP
Web Server (WinCE IIS): Supports ASP, ISAPI Secure Socket Layer (SSL 2/3) and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions
Dial-up Networking: Supports RAS client API and PPP, Extensible Authentication Protocol (EAP), and RAS scripting
Watchdog: Features a hardware function to trigger system reset in a user-specified time interval. (Moxa API provided)
Application Development Software:
• Moxa WinCE 6.0 SDK
• Moxa API Library
• C runtime libraries
• Component Services (COM and DCOM)
• Microsoft® .NET Compact Framework 3.5
• XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
• SOAP Toolkit Client
• Winsock 2.2

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

UC-8416-LX: RISC-based industrial embedded computer with 8 serial ports, 4 DIs, 4 DOs, 3 LANs, 8 switch ports, CompactFlash, USB, Linux OS, -10 to 60°C operating temperature
UC-8416-CE: RISC-based industrial embedded computer with 8 serial ports, 4 DIs, 4 DOs, 3 LANs, 8 switch ports, CompactFlash, USB, Windows CE 6.0 OS, -10 to 60°C operating temperature
UC-8416-T-LX: RISC-based industrial embedded computer with 8 serial ports, 4 DIs, 4 DOs, 3 LANs, 8 switch ports, CompactFlash, USB, Linux OS, -40 to 75°C operating temperature
UC-8416-T-CE: RISC-based industrial embedded computer with 8 serial ports, 4 DIs, 4 DOs, 3 LANs, 8 switch ports, CompactFlash, USB, Windows CE 6.0 OS, -40 to 75°C operating temperature
UC-8418-LX: RISC-based industrial embedded computer with 8 serial ports, 12 DIs, 12 DOs, 3 LANs, 2 CAN ports, CompactFlash, USB, Linux OS, -10 to 60°C operating temperature
UC-8418-CE: RISC-based industrial embedded computer with 8 serial ports, 12 DIs, 12 DOs, 3 LANs, 2 CAN ports, CompactFlash, USB, Windows CE 6.0 OS, -10 to 60°C operating temperature
UC-8418-T-LX: RISC-based industrial embedded computer with 8 serial ports, 12 DIs, 12 DOs, 3 LANs, 2 CAN ports, CompactFlash, USB, Linux OS, -40 to 75°C operating temperature
UC-8418-T-CE: RISC-based industrial embedded computer with 8 serial ports, 12 DIs, 12 DOs, 3 LANs, 2 CAN ports, CompactFlash, USB, Windows CE 6.0 OS, -40 to 75°C operating temperature

Package Checklist

- UC-8416/8418 embedded computer
- Wall-mounting kit
- DIN-rail mounting kit
- Ethernet cable: RJ45-to-RJ45 cross-over cable, 100 cm
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- Universal power adapter (including power jack converter)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

UC-7101/7110/7112 Series

RISC ready-to-run embedded computers with 1 or 2 serial ports, dual LANs, SD

- MOXA ART ARM9 32-bit 192 MHz processor
- 16 or 32 MB RAM
- 8 or 16 MB Flash ROM
- Dual or single 10/100 Mbps Ethernet for network redundancy
- 1 or 2 software-selectable RS-232/422/485 ports
- 50 bps to 921.6 kbps baudrate (nonstandard baudrates supported)
- SD socket for storage expansion
- Built-in real-time clock (RTC) and buzzer
- Pre-installed Linux Kernel 2.6 platform
- -40 to 75°C wide-temperature models available

Overview

The UC-7101/UC-7110/UC-7112 mini RISC-based communication platforms are ideal for embedded applications. The computers come with 1 or 2 RS-232/422/485 serial ports and single or dual 10/100 Mbps Ethernet LAN ports to provide users with a versatile communication platform.

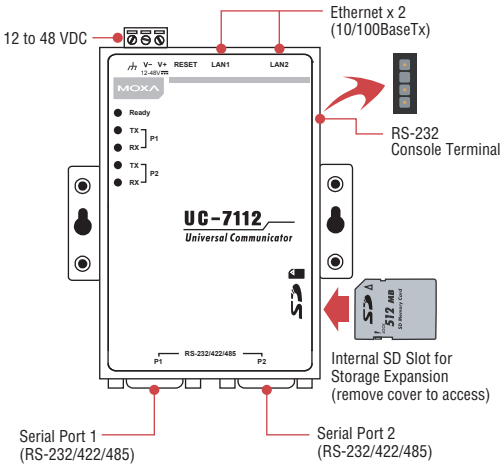
The UC-7101/UC-7110/UC-7112 platforms use the ARM9 RISC CPU. The architecture and modern semiconductor technology used in the ARM9 RISC CPU are designed to provide the CPU with a powerful computing engine and many useful communication functions, but without generating too much heat. The built-in 8 or 16 MB NOR Flash ROM and 16 or 32 MB SDRAM provide plenty of storage, and the SD socket (UC-7101 and UC-7112 only) provide users with flexible storage expansion to run applications that generate a lot of data.

The dual or single LAN ports built into the ARM9 make the UC-7101/7110/UC-7112 computers ideal communication platforms for data acquisition and protocol conversion applications, and the 1 or 2 RS-232/422/485 serial ports allow you to connect a variety of serial devices.

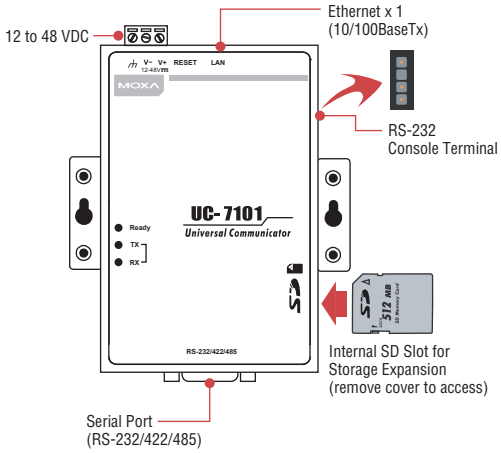
The pre-installed µClinux or Linux operating system provides an open platform for software development. This means that software written for desktop PCs can be easily ported to a UC-7101, UC-7110, or UC-7112 embedded computer with a GNU cross complier, eliminating the need to spend time modifying existing code. The operating system, device drivers, and your own software can all be stored in the UC-7101/UC-7110/UC-7112's flash memory.

Appearance

UC-7110/UC-7112



UC-7101



Hardware Specifications

Computer

CPU: MOXA ART ARM9 32-bit RISC CPU, 192 MHz
DRAM:
UC-7101/7110/7112: 16 MB
UC-7112 Plus: 32 MB
Flash:
UC-7101/7110/7112: 8 MB
UC-7112 Plus: 16 MB
OS (pre-installed): µClinux or Linux

Storage

Storage Expansion: SD slot (UC-7101, UC-7112, and UC-7112 Plus only)

Ethernet Interface

LAN: Auto-sensing 10/100 Mbps (RJ45)
• UC-7101: 1 port
• UC-7110/7112/7112 Plus: 2 ports
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface

Serial Standards: RS-232/422/485 software-selectable (DB9 male)
• UC-7101: 1 port
• UC-7110/7112: 2 ports
ESD Protection: 4 kV ESD for all signals
Console Port: RS-232 (TxD, RxD, GND)
• UC-7101: 4-pin pin header output
• UC-7110/7112: 3-wire pin-header

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 kbps (supports nonstandard baudrates; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

LEDs

System: Ready
LAN: LED located on the RJ45 connector
• UC-7101: 10M/Link x 1, 100M/Link x 1
• UC-7110/7112: 10M/Link x 2, 100M/Link x 2
Serial:
• UC-7101: TxD x 1, RxD x 1
• UC-7110/7112: TxD x 2, RxD x 2

Physical Characteristics

Housing: Aluminum (1 mm)
Weight:
• UC-7101: 130 g (0.29 lb)
• UC-7110/7112: 190 g (0.42 lb)
Dimensions:
• UC-7101: 67 x 22 x 100.4 mm (2.64 x 0.87 x 3.95 in)
• UC-7110/7112: 77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)
Mounting: DIN rail, wall

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: 1 Grms @ IEC-68-2-6, sine wave (resonance search), 5-500 Hz, 1 Oct/min, 1 cycle, 13 min 17 sec per axis (UC-7101/7110 only)

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current:
• 170 mA @ 24 VDC
• 340 mA @ 12 VDC
Power Consumption: 4.5 W

Standards and Certifications

Safety:
• UC-7101: UL 60950, CSA-C22.2 No. 60950-1, EN 60950-1
• UC-7110/7112: UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1
EMC: EN 55022 Class A, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A, DNV
Green Product: RoHS, CRoHS, WEEE

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)

Time:
UC-7101: 514,973 hrs
UC-7110: 149,414 hrs
UC-7112 Plus: 148,980 hrs
UC-7112: 148,980 hrs
Standard:
UC-7101: Telcordia (Bellcore) Standard
UC-7110: MIL-HDBK-217F
UC-7112 Plus: Bellcore-SR332
UC-7112: MIL-HDBK-217F

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty
Note: These hardware specifications describe the embedded computer unit itself, but not its official accessories. In particular, the wide temperature specification does not apply to accessories such as power adapters and cables.

Software Specifications

Linux (UC-7112-LX Plus only)

OS: Linux 2.6.38
File System: JFFS2, NFS, Ext2, Ext3, Ext4, VFAT/FAT
Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMP v1/v2c, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, TFTP, PPP, PPPoE, SSH 1.0/2.0, SSL
Internet Security: OpenVPN, IPTables Firewall, OpenSSL
Terminal Server (SSH): Provides secure encrypted communications between two untrusted hosts over an unsecure network
Dial-up Networking: PPP Daemon (pppd) for Linux that uses the PPP protocol and allows Unix machines to connect to the Internet as PPP servers or clients, through dialup. The PPP Daemon Works with chat, dip, and diald programs among others, and supports the IP, TCP, UDP, and IPX for Linux (Novell) protocols.
Watchdog: Features a hardware function to trigger system reset in a user-specified time interval(Moxa API provided)
Moxa Package Management System (MPKG): Provides package management system which you can install/uninstall software utilities or libraries.
IP Bonding: Linux standard bonding driver provides a method for aggregating multiple network interfaces into a single logical “bonded” interface.
Net-SNMP: Support v1 and v2c.
Cryptographic Hardware Accelerator: Supports DES-ECB, DES-CBC, DES-EDE3, AES-ECB, and AES-CBC algorithms
Debian: Debian 5 lenny port provided
Application Development Software:
• Moxa API Library (Moxa serial I/O control, Moxa DI/DO API, Moxa buzzer API)
• GNU C/C++ cross-compiler
• GNU C library

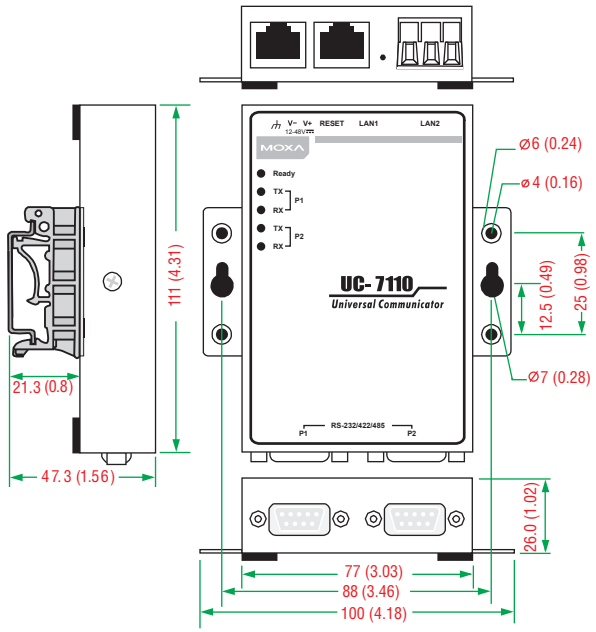
µClinux

OS: µClinux 2.6.19
File System: JFFS2
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, TFTP, PPP, PPPoE
Web Server (Boa): Allows you to create and manage web sites
Terminal Server (Telnet): Provides telnet communications between two hosts over the network
Dial-up Networking: PPP Daemon (pppd) for Linux that uses the PPP protocol and allows Unix machines to connect to the Internet as PPP servers or clients, through dialup. The PPP Daemon Works with chat, dip, and diald programs among others, and supports the IP, TCP, UDP, and IPX for Linux (Novell) protocols.
Application Development Software:
• Moxa API Library (Watchdog timer, Moxa serial I/O control)
• arm-elf-gcc: C/C++ cross-compiler
• µClibc: POSIX standard C library

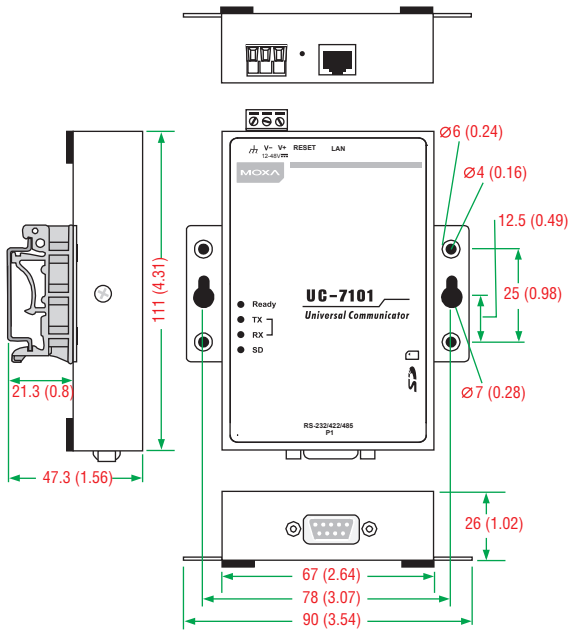
Dimensions

UC-7110/UC-7112

Unit: mm (inch)



UC-7101



Model Name	Serial Ports	LAN Ports	Storage	OS		Wide Temp.
	RS-232/422/485	10/100 Mbps	SD	uClinux	Linux	
UC-7101	1	1	✓	✓	–	✓
UC-7110	2	2	–	✓	–	✓
UC-7112	2	2	✓	✓	✓	–

Ordering Information

Available Models

UC-7101-LX: Mini RISC-based embedded computer with 1 serial port, LAN, µClinux OS, -10 to 60°C operating temperature
UC-7110-LX: Mini RISC-based embedded computer with 2 serial ports, dual LANs, µClinux OS, -10 to 60°C operating temperature
UC-7112-LX: Mini RISC-based embedded computer with 2 serial ports, dual LANs, SD, µClinux 2.6 OS, -10 to 60°C operating temperature
UC-7112-LX Plus: Mini RISC-based embedded computer with 2 serial ports, dual LANs, SD, Linux 2.6 OS, -10 to 60°C operating temperature
UC-7101-T-LX: Mini RISC-based embedded computer with 1 serial port, LAN, µClinux OS, -40 to 75°C operating temperature
UC-7110-T-LX: Mini RISC-based embedded computer with 2 serial ports, dual LANs, µClinux OS, -40 to 75°C operating temperature

Package Checklist

- UC-7101 or UC-7110 or UC-7112 embedded computer
- Ethernet cable: RJ45-to-RJ45 cross-over cable, 100 cm
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- Universal power adapter (including terminal block to power jack converter)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

UC-7122/7124 Series

RISC ready-to-run embedded computers with dual LANs, 2 or 4 serial ports, SD, USB

- Cirrus Logic EP9302 ARM9 32-bit 200 MHz processor
- On-board 32 MB RAM, 16 MB flash disk
- 2 or 4 software-selectable RS-232/422/485 serial ports
- 50 bps to 921.6 kbps baudrate (nonstandard baudrates supported)
- Dual 10/100 Mbps Ethernet for network redundancy
- SD socket for storage expansion supported
- Built-in real-time clock (RTC), buzzer, watchdog timer (WDT)
- Ready-to-run WinCE 5.0 platform
- -40 to 75°C wide temperature models available

Overview

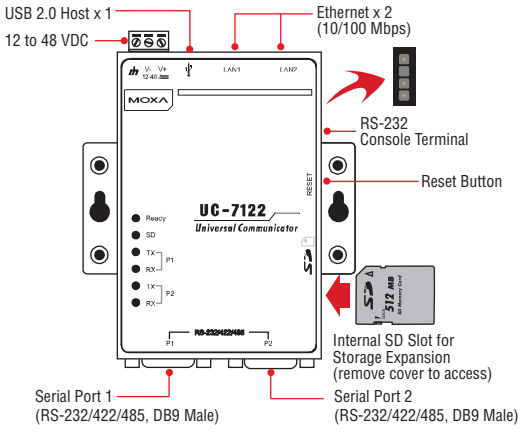
The UC-7122/7124 embedded computers come with 2 or 4 RS-232/422/485 serial ports and dual 10/100 Mbps Ethernet LAN ports to provide users with a versatile communication platform, making these RISC-based embedded computers ideal for your embedded applications.

The UC-7122/7124 embedded computers use the Cirrus Logic EP9302 ARM9 200 MHz RISC CPU. Unlike the x86 CPU, which uses a CISC design, the ARM9's RISC design architecture and modern semiconductor technology provide the UC-7122/7124 with a powerful computing engine and communication functions, but without generating too much heat. Moreover, the built-in 16 MB NOR Flash ROM and 32 MB SDRAM give you enough storage capacity to run applications on the UC-7122/7124 computers. The additional SD socket provides the flexibility of adding storage expansion disks, and the dual LAN ports built into the ARM9 make the UC-7122/7124 ideal communication platforms for simple data acquisition and protocol conversion applications. The RS-232/422/485 serial ports on these computers allow you to connect a variety of serial devices. These features ensure that the UC-7122/7124 embedded computers are convenient and powerful central control units for industrial applications, such as data acquisition, remote device control and monitoring, and protocol conversion.

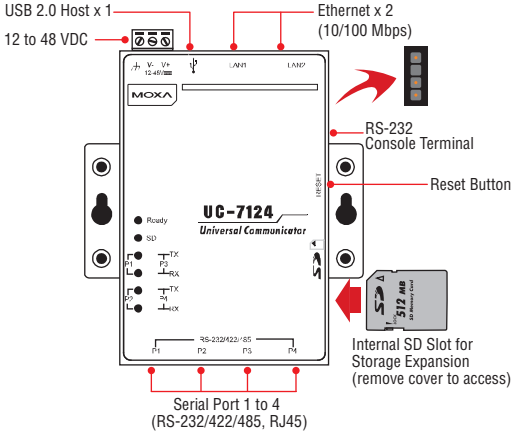
The pre-installed WinCE 5.0 operating system provides a common Windows-based software operating system for software program development. This means that software written in Visual C/C++ for desktop PCs can easily be ported to the UC-7122/7124 computers with a general programming tool such as Microsoft Embedded Visual C++ or Microsoft Visual Studio 2005. You will not need to spend time modifying existing software code, the operating system, device or the drivers. You can store the software that you created on the computer's flash memory without any modification.

Appearance

UC-7122



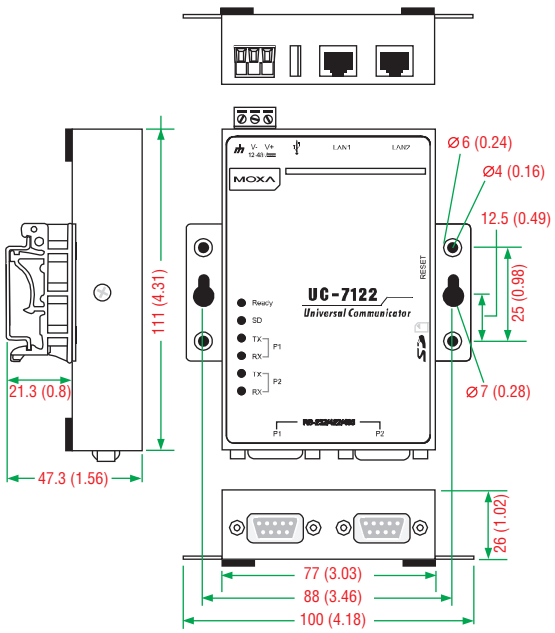
UC-7124



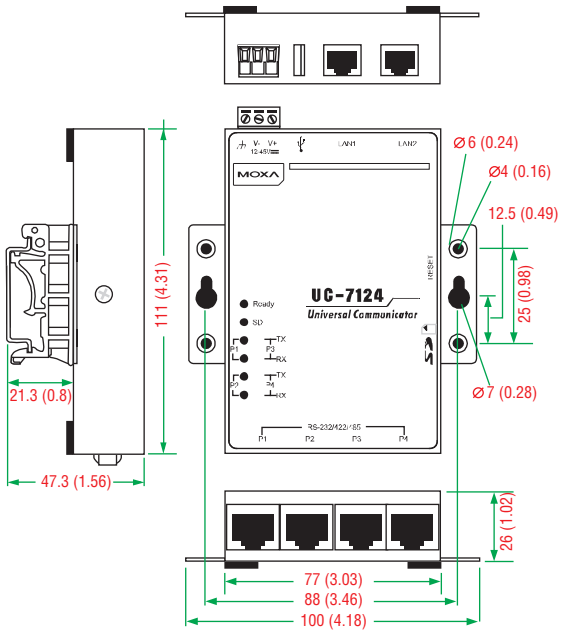
Dimensions

UC-7122

Unit: mm (inch)



UC-7124



Hardware Specifications

Computer

CPU: Cirrus EP9302 ARM9 CPU, 200 MHz
USB: USB 2.0 hosts x 1, type A connector
DRAM: DDR2 SDRAM, 32 MB
Flash: NOR Flash, 16 MB
OS (pre-installed): Windows CE 5.0

Storage

Storage Expansion: SD slot

Ethernet Interface

LAN: Auto-sensing 10/100 Mbps ports (RJ45) x 2
Magnetic Isolation Protection: 1.5 kV, built-in

Serial Interface

Serial Standards:
UC-7122: RS-232/422/485 ports, software-selectable (DB9 male) x 2
UC-7124: RS-232/422/485 ports, software-selectable (RJ45) x 4
ESD Protection: 4 kV for all signals
Console Port: RS-232 (TxD, RxD, GND), 4-pin pin header output

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 kbps (supports nonstandard baudrates; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

LEDs

System: Ready, SD
LAN: 10M/Link x 2, 100M/Link x 2 (on connector)
Serial: TxD, RxD (2 or 4 of each)

Physical Characteristics

Housing: Aluminum (1 mm)
Weight:
UC-7122: 190 g (0.42 lb)
UC-7124: 200 g (0.44 lb)
Dimensions: 77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)
Mounting: DIN rail, wall

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: 1 Grms @ IEC-68-2-6, sine wave (resonance search), 5-500 Hz, 1 Oct/min, 1 cycle, 13 min 17 sec per axis

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current:
UC-7122:
• 170 mA @ 24 VDC
• 340 mA @ 12 VDC
UC-7124:
• 180 mA @ 24 VDC
• 360 mA @ 12 VDC
Power Consumption:
• UC-7122: 4.1 W
• UC-7124: 4.3 W

Standards and Certifications

Safety: UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1
EMC: EN 55022 Class A, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A
Green Product: RoHS, CRoHS, WEEE

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)

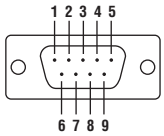
Time:
• UC-7122: 234,746 hrs
• UC-7124: 210,233 hrs
Standard: Telcordia (Bellcore) Standard

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty
Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adapter and cables.

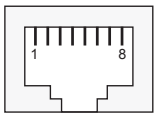
Pin Assignment

UC-7122 (DB9 male connector)



PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

UC-7124 (8-pin RJ45 connector)



PIN	RS-232	RS-422/485-4w	RS-485
1	DSR	–	–
2	RTS	TxD+	–
3	GND	GND	GND
4	TxD	TxD-	–
5	RxD	RxD+	Data+(B)
6	DCD	RxD-	Data-(A)
7	CTS	–	–
8	DTR	–	–

Software Specifications

Windows Embedded CE 5.0

OS: Windows Embedded CE 5.0
File System: FAT (for onboard flash memory)
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP
Web Server (WinCE IIS): Supports ASP, ISAPI Secure Socket Layer (SSL 2/3) and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions
Dial-up Networking: Supports RAS client API and PPP, Extensible Authentication Protocol (EAP), and RAS scripting
Watchdog: Features a hardware function to trigger system reset based on a user-specified time interval. (Moxa API provided)

Application Development Software:
• Moxa WinCE 5.0 SDK
• Moxa API Library
• C runtime libraries
• Component Services (COM and DCOM)
• Microsoft® .NET Compact Framework 2.0 with SP2
• XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
• SOAP Toolkit
• Winsock 2.2

Ordering Information

Available Models

UC-7122-CE: Mini RISC-based embedded computer with 2 serial ports, dual LANs, SD, USB, WinCE 5.0, -10 to 60°C operating temperature
UC-7124-CE: Mini RISC-based embedded computer with 4 serial ports, dual LANs, SD, USB, WinCE 5.0, -10 to 60°C operating temperature
UC-7122-T-CE: Mini RISC-based embedded computer with 2 serial ports, dual LANs, SD, USB, WinCE 5.0, -40 to 75°C operating temperature
UC-7124-T-CE: Mini RISC-based embedded computer with 4 serial ports, dual LANs, SD, USB, WinCE 5.0, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DK35A: DIN-rail mounting clips, 35 mm, 2 DIN-rail plates with 4 screws

Package Checklist

- UC-7122 or UC-7124 embedded computer
- Ethernet cable: RJ45-to-RJ45 cross-over cable, 100 cm
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- CBL-RJ45M9-150: 8-pin RJ45-to-DB9 male serial port cable, 150 cm
- Universal power adapter (including terminal block to power jack converter)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Model Name	Serial Ports	LAN Ports	Storage		OS		Wide Temp.
	RS-232/422/485	10/100 Mbps	SD	USB	CE 5.0	Linux	
UC-7122	2	2	✓	1	✓	–	✓
UC-7124	4	2	✓	1	✓	–	✓

IA260 Series

Award-winning Product
TAIWAN EXCELLENCE 2009

RISC-embedded computers with 4 serial ports, dual LANs, VGA, DIOs, CompactFlash, USB

- Cirrus Logic EP9315 ARM9 CPU, 200 MHz
- 128 MB RAM on-board, 32 MB flash disk
- 4 software-selectable RS-232/422/485 serial ports
- VGA interface for field site monitoring
- Dual 10/100 Mbps Ethernet for network redundancy
- 8+8 DI/DO channels, up to 30 VDC
- 12 to 48 VDC power input design
- Supports CompactFlash and USB 2.0 hosts
- Ready-to-run Linux or WinCE 6.0 platform
- H-type heat dissipation design for system reliability
- -40 to 75°C wide operating temperature model available

Overview

The IA260 embedded computers come with 4 RS-232/422/485 serial ports, dual Ethernet ports, 8 digital input channels, 8 digital output channels, a VGA output, 2 USB hosts, and a CompactFlash socket. The computers are housed in a compact, IP40 protected, industrial-strength aluminum case.

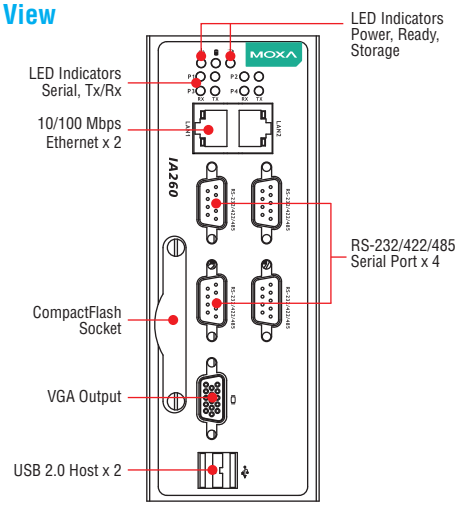
The IA260 computers use the Cirrus Logic EP9315 ARM9, 32-bit, 200 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but will not generate too much heat. The built-in 32 MB NOR Flash ROM and 128 MB SDRAM give you enough memory to run your application software directly on the IA260.

The patented "H-Type" heat dissipation design can directly transmit heat from inside the housing to the outside, which makes the IA260 an ideal computing unit for applications that involve extremely high temperatures. With its built-in VGA output interface, the IA260 computers are suitable for use with SCADA systems in industrial applications, such as factory automation, production line process monitoring, and mining automation, that require VGA and HMI features.

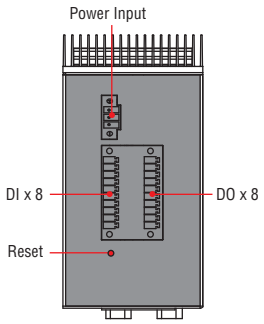
The IA260 computers support RS-232/422/485, digital I/O, and have dual LAN ports, making them ideal for communication platforms in industrial applications that require network redundancy. In addition to the standard model, a wide-temperature (-40 to 75°C) model is available for use in harsh industrial-automation environments.

Appearance

Front View



Top View



Hardware Specifications

Computer
CPU: Cirrus EP9315 ARM9 CPU, 200 MHz
USB: USB 2.0 hosts x 2, type A connector
DRAM: DDR2 SDRAM, 128 MB
Flash: NOR Flash, 32 MB
OS (pre-installed): Linux or Windows CE 6.0

Storage
Storage Expansion: CF card type I/II

Display
Graphics Controller: EP9315 internal graphics accelerator engine with TTL graphical signal support
Display Memory: Dynamic video memory (shares system memory)
Display Interface: CRT interface for VGA output, DB15 female connector
Resolution: 1024 x 768, 8 bits

Ethernet Interface
LAN: Auto-sensing 10/100 Mbps ports (RJ45) x 2
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface
Serial Standards: RS-232/422/485 ports, software-selectable (DB9 male) x 4
ESD Protection: 4 kV for all signals
Console Port: RS-232 (TxD, RxD, GND), 4-pin header output (115200, n, 8, 1)

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 kbps (supports nonstandard baudrates; see user's manual for details)

Serial Signals
RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Digital Input
Input Channels: DI x 8
Input Voltage: 0 to 30 VDC
Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open
Digital Input Levels for Wet Contacts:
• Logic level 0: +3 V max.
• Logic level 1: +10 V to +30 V (COM to DI)
Connector Type: 10-pin screw-fastened terminal block (8 points, COM, GND)
Isolation: 3 kV optical isolation

Digital Output
Output Channels: DO x 8, sink type
Output Current: Max. 200 mA per channel
On-State Voltage: 24 VDC nominal, open collector to 30 V
Connector Type: 9-pin screw-fastened terminal block
Isolation: 3 kV optical isolation

LEDs
System: Power, Ready, Storage
LAN: 10M/Link x 2, 100M/Link x 2 (on connector)
Serial: TxD x 4, RxD x 4

Switches and Buttons
Reset Button: Supports "Reset to Factory Default"

Physical Characteristics
Housing: Aluminum, industrial vertical form factor
Weight: 1 kg (2.22 lb)
Dimensions: 52 x 112.6 x 162 mm (2.05 x 4.43 x 6.38 in)
Mounting: DIN-rail, wall

Environmental Limits
Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: 2 Grms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis
Anti-Shock: 20 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements
Input Voltage: 12 to 48 VDC (3-pin terminal block)
Input Current:
With no load on USB ports:
• 240 mA @ 24 VDC
• 480 mA @ 12 VDC
With full load on USB ports:
• 450 mA @ 24 VDC
• 900 mA @ 12 VDC
Power Consumption:
With no load on USB ports: 5.8 W
With full load on USB ports: 11 W

Standards and Certifications
Safety: UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1, CCC (GB4943, GB9254, GB17625.1)
EMC: EN 55022 Class A, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 1 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 3 V/m
IEC 61000-4-8 1 A/m
IEC 61000-4-11
Green Product: RoHS, CRoHS, WEEE

Reliability
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)
Time: 145,328 hrs
Standard: Telcordia (Bellcore) Standard

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty
Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adapter and cables.

Software Specifications

Linux

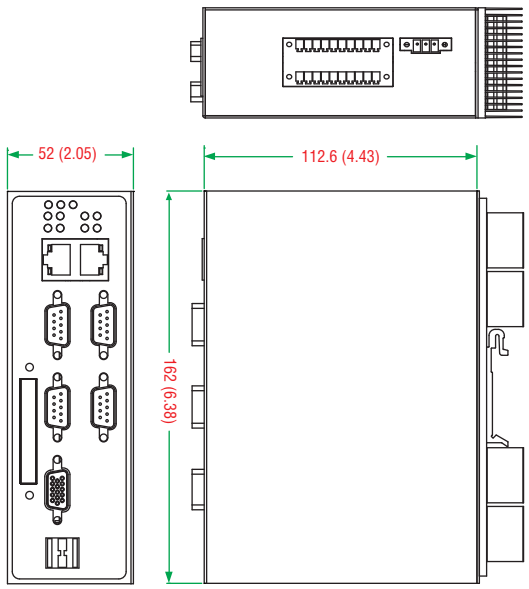
OS: Linux 2.6.23
Web Server (Apache): Allows you to create and manage web sites
Terminal Server (SSH): Provides secure encrypted communications between two untrusted hosts over an unsecure network
File System: JFFS2, NFS, Ext2, Ext3
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, IPTables Firewall
Dial-up Networking: PPP Daemon (pppd) for Linux that uses the PPP protocol and allows Unix machines to connect to the Internet as PPP servers or clients, through dialup. The PPP Daemon Works with chat, dip, and diald programs among others, and supports the IP, TCP, UDP, and IPX for Linux (Novell) protocols.
Watchdog: Features a hardware function to trigger system reset in a user-specified time interval (Moxa API provided)
Application Development Software:
• Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
• GNU C/C++ cross-compiler
• GNU C library
• GDB source-level debugging server
Software Protection: Encryption tool for user executable files (based on patented Moxa technology)

Windows Embedded CE 6.0

OS: Windows Embedded CE 6.0
File System: FAT (for onboard flash memory)
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP
Web Server (WinCE IIS): Supports ASP, ISAPI Secure Socket Layer (SSL 2/3) and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions
Dial-up Networking: Supports RAS client API and PPP, Extensible Authentication Protocol (EAP), and RAS scripting
File Server: Enables remote clients to access files and other resources over the network
Watchdog: Features a hardware function to trigger system reset in a user-specified time interval. (Moxa API provided)
Application Development Software:
• Moxa WinCE 6.0 SDK
• Moxa API Library
• C Libraries and Run-times
• Component Services (COM and DCOM)
• Microsoft® .NET Compact Framework 2.0
• XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
• SOAP Toolkit Client
• Winsock 2.2

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

IA260-CE: RISC-based embedded computer with 4 serial ports, 8 DIs, 8 DOs, dual LANs, VGA, CompactFlash, USB, Win CE 6.0 OS, -10 to 60°C operating temperature
IA260-LX: RISC-based industrial embedded computer with 4 serial ports, 8 DIs, 8 DOs, dual LANs, VGA, CompactFlash, USB, Linux OS, -10 to 60°C operating temperature
IA260-T-CE: RISC-based embedded computer with 4 serial ports, 8 DIs, 8 DOs, dual LANs, VGA, CompactFlash, USB, Win CE 6.0 OS, -40 to 75°C operating temperature
IA260-T-LX: RISC-based industrial embedded computer with 4 serial ports, 8 DIs, 8 DOs, dual LANs, VGA, CompactFlash, USB, Linux OS, -40 to 75°C operating temperature

Package Checklist

- IA260 or IA260-T embedded computer
- Wall-mounting kit
- DIN-rail mounting kit
- Ethernet cable: RJ45-to-RJ45 cross-over cable, 100 cm
- CBL-RJ45F9-150: 8-pin RJ45-to-DB9 female console port cable, 150 cm
- CBL-RJ45M9-150: 8-pin RJ45-to-DB9 male serial port cable, 150 cm
- Universal power adapter
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

IA240 Series

Award-winning Product
TAIWAN EXCELLENCE 2006

RISC-embedded computers with 4 serial ports, 4 DI and 4 DO channels, dual LANs, PCMCIA, SD

- MOXA ART 32-bit ARM9 industrial processor
- 64 MB RAM, 16 MB flash onboard
- 4 RS-232/422/485 serial ports
- 4 digital input and 4 digital output channels (TTL signal)
- Dual 10/100 Mbps Ethernet for network redundancy
- SD socket for storage expansion
- Ready-to-run Linux Kernel 2.6 platform
- Unique patented Software Encryption Lock
- Installation options: DIN-rail, wall-mount (with accessory)
- Robust, fanless design, IP30 protection mechanism
- -40 to 75°C wide-temperature models available

Overview

The IA240 embedded computers are designed for industrial automation applications. The computers feature 4 RS-232/422/485 serial ports, dual LANs, 4 digital input channels, 4 digital output channels, and a PCMCIA cardbus and SD socket in a compact, IP30-protected, industrial-strength rugged housing.

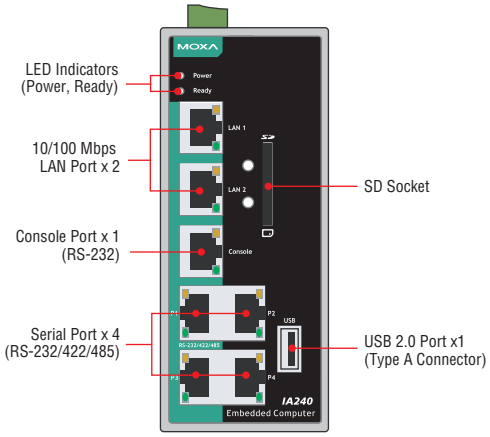
The IA240's vertical DIN-rail form factor makes it easy to install the computers in a small cabinet. This space-saving solution also facilitates easy wiring, making the IA240 a great choice as front-end embedded controllers for industrial applications.

Wide-temperature models of the IA240 are also available. The IA240-T can operate reliably in a temperature range from -40 to 75°C, making them appropriate for harsh industrial automation environments.

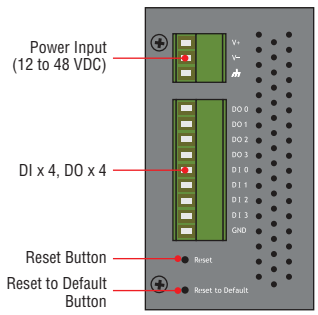
The industrial design of the IA240 provides a robust, reliable computing platform. Due to their RISC-based architecture, the IA240 computers will not generate a lot of heat, making them ideal for industrial automation environments.

Appearance

Front View



Top View



Hardware Specifications

Computer
CPU: MOXA ART ARM9 32-bit RISC CPU, 192 MHz
USB: USB 2.0 hosts x 1, type A connector
DRAM: DDR2 SDRAM, 64 MB
Flash: NOR Flash, 16 MB
OS (pre-installed): Embedded Linux

Storage
Storage Expansion: SD slot

Ethernet Interface
LAN: Auto-sensing 10/100 Mbps ports (RJ45) x 2
Magnetic Isolation Protection: 1.5 kV, built-in

Serial Interface
Serial Standards: RS-232/422/485 ports, software-selectable (8-pin RJ45) x 4
ESD Protection: 4 kV for all signals
Console Port: RS-232, RJ45 connector, supports PPP

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 kbps (supports nonstandard baudrates; see user's manual for details)

Serial Signals
RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Digital Input
Input Channels: DI x 4
Input Voltage:
Logic 0: 0-0.8 V
Logic 1: 2.0-5.5 V
Over-current Limit: -24 mA

Digital Output
Output Channels: DO x 4
Output Current: 24 mA
Output Voltage:
Logic 0: 0-0.55 V
Logic 1: 2.5-3.3 V

LEDs
System: Power, Ready, Storage
LAN: 10M/Link x 2, 100M/Link x 2 (on connector)
Serial: TxD x 4, RxD x 4 (on connector)

Switches and Buttons
Reset Button: Supports "Reset to Factory Default"

Physical Characteristics
Housing: SECC sheet metal (1 mm)
Weight:
430 g (0.96 lb)
Dimensions: 60 x 137 x 100 mm (2.36 x 5.39 x 3.94 in)
Mounting: DIN rail, wall

Environmental Limits
Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: 1 Grms @ IEC-68-2-6, sine wave (resonance search), 5-500 Hz, 1 Oct/min, 1 cycle, 13 min 17 sec per axis

Power Requirements
Input Voltage: 12 to 48 VDC
Input Current:
• 300 mA @ 24 VDC
• 600 mA @ 12 VDC
Power Consumption: 7 W

Standards and Certifications
Safety: UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1
EMC: EN 55022 Class A, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 1 kV
IEC 61000-4-6 CS: Signal: 10 V/m
IEC 61000-4-8 1 A/m
IEC 61000-4-11
Green Product: RoHS, CRoHS, WEEE

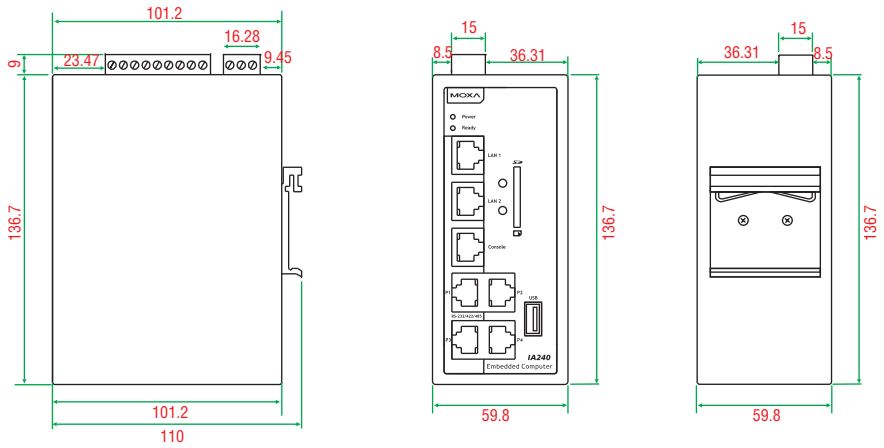
Reliability
Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)
Time: 425,321 hrs
Standard: Telcordia (Bellcore) Standard

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty
Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adapter and cables.

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View

Software Specifications

Linux

OS: Linux 2.6.9
Web Server (Apache): Allows you to create and manage web sites
Terminal Server (SSH): Provides secure encrypted communications between two untrusted hosts over an unsecure network
File System: JFFS2
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, IPTables Firewall
Dial-up Networking: PPP Daemon (pppd) for Linux that uses the PPP protocol and allows Unix machines to connect to the Internet as PPP servers or clients, through dialup. The PPP Daemon works with chat, dip, and diald programs among others, and supports the IP, TCP, UDP, and IPX for Linux (Novell) protocols.
Watchdog: Features a hardware function to trigger system reset in a user-specified time interval (Moxa API provided)
Application Development Software:
• Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
• GNU C/C++ cross-compiler
• GNU C library
• GDB source-level debugging server
Software Protection: Encryption tool for user executable files (based on patented Moxa technology)

Ordering Information

Available Models

IA240-LX: RISC-based industrial computer with 4 serial ports, 4 DIs and 4 DO channels, dual LANs, SD, Linux OS, -10 to 60°C operating temperature
IA240-T-LX: RISC-based industrial computer with 4 serial ports, 4 DIs and 4 DO channels, dual LANs, SD, Linux OS, -40 to 75°C operating temperature

Package Checklist

- IA240 embedded computer
- Wall-mounting kit
- Ethernet cable: RJ45-to-RJ45 cross-over cable, 100 cm
- CBL-RJ45F9-150: 8-pin RJ45-to-DB9 female console port cable, 150 cm
- CBL-RJ45M9-150: 8-pin RJ45-to-DB9 male serial port cable, 150 cm
- Universal power adapter (including terminal block to power jack converter)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Wireless Computers

Product Selection Guide

Wireless Embedded Computers 27-2

Multiple WAN Programmable Routers

MAR-2000 Series: Industrial multi-radio mobile access and applications router. 27-3

Cellular Computers

W6000 Series: Compact, rugged, wireless computer with 3G/LTE, LAN, and 2 serial ports 27-7

WLAN Computers

UC-8100-ME-T Series: Communication-centric RISC computing platform 27-10

UC-8410A Series: Highly efficient, security-enabled, wireless platform that supports a rich set of interfaces . . . 27-14

Wireless Embedded Computers

Preliminary

Preliminary

Preliminary

	MAR-2000	W6000	UC-8100-ME-T	UC-8410A
Computer				
CPU Speed	533 Mhz	300 MHz	1 GHz	1 GHz x 2
OS (pre-installed)	Linux	Linux	Linux	Linux Debian 8
DRAM	512 MB	512 MB	512 MB	512 MB
Flash	32 MB	4 GB	4 GB	–
USB Ports	2 (USB 2.0)	–	1 (USB 2.0)	2 (USB 2.0 Type A)
Relay Outputs	4 DIs, 4 DOs	–	–	4 DIs, 4 DOs
Storage				
SD Slots	–	mSD Slot x 1	SD Slot x 1	SD Slot x 1, with 1 GB pre-installed
CompactFlash	✓	–	–	–
mSATA Slots	–	–	–	1
LAN Interface				
10/100 Mbps Ethernet Ports	2	1	2	–
10/100/1000 Mbps Ethernet Ports	–	–	–	3
Magnetic Isolation Protection	1.5 kV	1.5 kV	1.5 kV	1.5 kV
WLAN Interface				
Standard Compliance	802.11a/b/g/n	802.11a/b/g/n	–	802.11a/b/g/n
Radio Frequency Type	DSSS, CCK, OFDM	DSSS, CCK, OFDM	–	DSSS, CCK, OFDM
Transmission Rate	54 Mbps (max.) with auto fallback (54, 48, 36, 24, 18, 12, 11, 9, 6, 5.5, 2. 1 Mbps) 802.11a/g: 6, 9, 12, 18, 24, 36, 48 54 Mbps 802.11b: 1, 2, 5.5, 11 Mbps	54 Mbps (max.) with auto fallback (54, 48, 36, 24, 18, 12, 11, 9, 6, 5.5, 2. 1 Mbps) 802.11a/g: 6, 9, 12, 18, 24, 36, 48 54 Mbps 802.11b: 1, 2, 5.5, 11 Mbps	–	802.11a: 6 to 54 Mbps 802.11b: 1 to 11 Mbps 802.11g: 6 to 54 Mbps
Wireless Security	WEP: 64/128-bit WPA, WPA2 data encryption	WEP: 64/128-bit WPA, WPA2 data encryption	–	64/128-bit WEP, WPA, WPA2, 802.1x
Cellular Interface				
Cellular Modes	GSM/GPRS/EDGE/UMTS/HSPA+	GSM/GPRS/EDGE/UMTS/HSPA+/LTE	GSM/GPRS/EDGE/UMTS/HSPA+/LTE	GSM/GPRS/EDGE/UMTS/HSPA+/LTE
Radio Frequency Bands	• Five band UMTS(WCDMA/FDD) • 800/850/1900 AWS and 2100 MHz • Quad-band GSM: 850/900/1800/1900 MHz • 4G: LTE-FDD / HSPA+ (B1, B2, B3, B5, B7, B8, B20) • 4G: LTE-FDD, HSPA+, GSM/GPRS/EDGE, GSM/GPRS/EDGE, CDMA (B1, B2, B4, B5, B8, B13, B17, B25, BC0, BC1, BC10)	• Five band UMTS(WCDMA/FDD) • 800/850/1900 AWS and 2100 MHz • Quad-band GSM: 850/900/1800/1900 MHz • 4G: LTE-FDD / HSPA+ (B1, B2, B3, B5, B7, B8, B20) • 4G: LTE-FDD, HSPA+, GSM/GPRS/EDGE, GSM/GPRS/EDGE, CDMA (B1, B2, B4, B5, B8, B13, B17, B25, BC0, BC1, BC10)	• Five band UMTS(WCDMA/FDD) • 800/850/1900 AWS and 2100 MHz • Quad-band GSM: 850/900/1800/1900 MHz • 4G: LTE-FDD / HSPA+ (B1, B2, B3, B5, B7, B8, B20) • 4G: LTE-FDD, HSPA+, GSM/GPRS/EDGE, GSM/GPRS/EDGE, CDMA (B1, B2, B4, B5, B8, B13, B17, B25, BC0, BC1, BC10)	• Five band UMTS(WCDMA/FDD) • 800/850/1900 AWS and 2100 MHz • Quad-band GSM: 850/900/1800/1900 MHz • 4G: LTE-FDD / HSPA+ (B1, B2, B3, B5, B7, B8, B20) • 4G: LTE-FDD, HSPA+, GSM/GPRS/EDGE, GSM/GPRS/EDGE, CDMA (B1, B2, B4, B5, B8, B13, B17, B25, BC0, BC1, BC10)
Serial Interface				
RS-232/422/485 Ports	2 (DB9 male)	2 (terminal block)	2 (terminal block)	8
ESD Protection	4 kV	15 kV	15 kV	15 kV
Console Port	–	✓	✓	✓
Serial Communication Parameters	Even, Odd, Space, Mark	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark
Flow Control	Flow Control RTS/CTS, XON/XOFF	RTS/CTS, XON/XOFF, ADDC™	RTS/CTS, XON/XOFF, ADDC™	RTS/CTS, XON/XOFF, ADDC™
Baudrate	50 bps to 115.2 kbps	50 bps to 921.6 kbps (nonstandard baudrates supported)	50 bps to 921.6 kbps (nonstandard baudrates supported)	50 bps to 115.2 kbps (nonstandard baudrates supported)
LEDs				
System	Power, Ready, Storage, Programmable	Ready, PWR	Ready, PWR	Ready, PWR
Diagnostics	–	–	✓	✓
LAN	10M, 100M	10M, 100M	10M, 100M	10M, 100M, 1000M
WAN	–	–	–	–
Cellular	–	Cellular Enabled, Signal Strength	Cellular Enabled, Signal Strength	Signal Strength
Serial	–	TxD, RxD	TxD, RxD	TxD, RxD
Physical Characteristics				
Housing	SECC sheet metal (1 mm)	SECC sheet metal (1 mm)	SECC sheet metal	SECC sheet metal (1 mm)
Weight	1 kg (2.22 lb)	875 g (1.94 lb)	1.02 kg (2.27 lb)	1 kg (2.22 lb)
Dimensions	200 x 57 x 120 mm	111 x 25 x 77 mm	141 x 54.8 x 125.6 mm	200 x 120 x 48.6 mm
Mounting	DIN rail, wall	DIN rail, wall	DIN rail, wall	DIN rail, wall
Environmental Limits				
Operating Temperature	-25 to 70°C (-13 to 158°F)	-40 to 70°C (-40 to 158°F)	-40 to 85°C (-40 to 185°F)	-10 to 60°C / -40 to 75°C (-14 to 140°F / -40 to 167°F)
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-40 to 80°C (-40 to 176°F)	-40 to 85°C (-40 to 185°F)	-40 to 85°C (-40 to 185°F)	-20 to 75°C / -40 to 85°C (-4 to 167°F / -40 to 185°F)
Anti Vibration/Shock	IEC 61373 standard	IEC 61373 standard	IEC 61373 standard	IEC 61373 standard
Regulatory Approvals				
Safety	UL 60950-1, EN 60950-1	UL 60950-1, EN 60950-1	UL 60950-1, EN 60950-1	UL 60950-1, EN 60950-1
EMC	EN 55022 Class B, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class B	EN 55022 Class B, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class B	EN 55022 Class B, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class B	EN 55022 Class B, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class B
Wheeled Vehicles	EN 50155, EN 50121-2-3, EN -4, IEC 61373	–	–	–
Green Product	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE
Reliability				
Buzzer, RTC, WDT	✓	✓	✓	✓
Warranty	5 years (see www.moxa.com/warranty)			
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MAR-2000 Series

Industrial multi-radio mobile access and applications router

- Dynamic routing across multiple WANs
- Policy-based routing management
- Simple Web management user interface
- IEEE 802.11a/b/g/n wireless AP/bridge/client
- Five-band UMTS/HSPA+ and quad-band GSM/GPRS/EDGE industrial IP-modems
- Complies with a portion of EN 50155 specifications
- Built-in 50-channel GPS for location-based applications
- -25 to 70°C wide temperature range (EN 50155 Class T3)

Overview

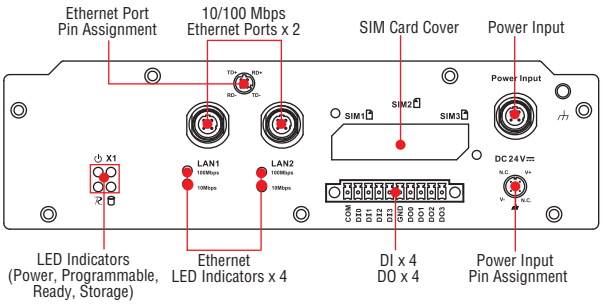
The MAR-2000 is a compact, simple, and programmable RISC-based wireless mobile router with strong wireless routing capabilities. With a built-in GPS module, HSPA+ cellular and 802.11a/b/g/n wireless capabilities, independent power switches on its cellular module connectors, and high thermal tolerance, the MAR-2000 is compliant with a portion of EN 50155 specifications. The built-in 32 MB NOR Flash ROM and 512 MB SDRAM give you enough memory for installing your own application software, the 512 MB NAND Flash can be used to provide additional data storage, and the CompactFlash socket is available for adding more memory when needed. The built-in GPS module supports geo-fencing functionality, making it ideal for managing wireless connections in cross-WAN environments often associated with rolling stock and other vehicular applications.

When a train travels to a different region, it often encounters switches that support different wireless interfaces, such as Wi-Fi, UMTS, and HSPA+. The MAR-2000 uses multiple-WAN support and backup functionality to ensure that your wireless connections are always available, stable, and reliable.

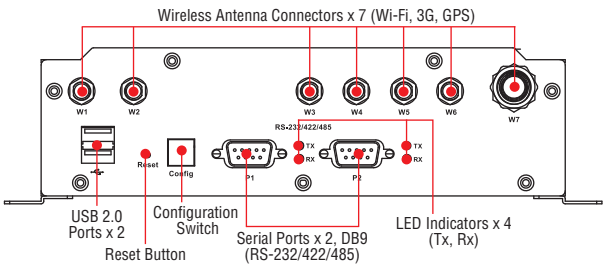
As an added bonus, the MAR-2000 series includes wide temperature models designed to operate reliably in extreme environments with temperatures ranging from -25 to 70°C.

Appearance

Front View

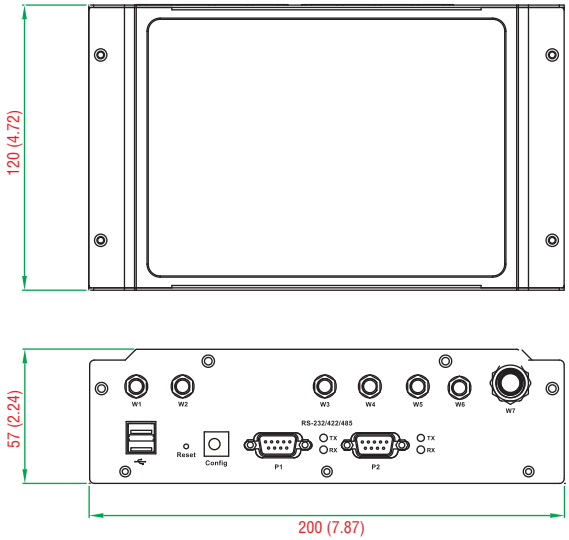


Rear View



Dimensions

Unit: mm (inch)



Hardware Specifications

Computer

CPU: Intel XScale IXP435, 533 MHz
USB: USB 2.0 hosts x 2, type A connector
DRAM: DDR2 SDRAM, 512 MB
Flash:
• NOR Flash, 32 MB onboard to store OS
• NAND Flash, 512 MB (1 GB max.) for OS file system, caching storage, and data logger
OS (pre-installed): Linux 3.8.13

Storage

Storage Expansion: CompactFlash (Type I/II) sockets x 1, up to 8 GB

Ethernet Interface

LAN: Auto-sensing 10/100 Mbps ports (M12) x 2
Magnetic Isolation Protection: 1.5 kV, built in

GPS Module (U-Blox LEA-6S)

Receiver Types:
• 50-channel U-blox 6 engine
• GPS L1 C/A code
• SBAS: WAAS, EGNOS, MSAS, GAGAN
Acquisition:
• Cold starts: 28 s
• Warm starts: 28 s
• Aided starts: 1 s
• Hot starts: 1 s
Sensitivity:
• Tracking: -160 dBm
• Reacquisition: -160 dBm
• Cold starts: -147 dBm
Timing Accuracy:
• RMS: 30 ns
• 99%: < 60 ns
• Granularity: 21 ns
Accuracy:
• Position: 2.5 m CEP
• SBAS: 2.0 m CEP
Protocols: NMEA, UBX binary, 5 Hz max. update rate (ROM version)
Time Pulse: 0.25 Hz to 1 kHz
Velocity Accuracy: 0.1 m/s
Heading Accuracy: 0.5 degrees
A-GPS: Supports AssistNow Online and AssistNow Offline, OMA SUPL compliant
Operational Limits: Velocity: 500 m/s (972 knots)
Connector Type: TNC

WLAN Module (Atheros AR9220)

WAPN001: IEEE 802.11a/b/g/n wireless LAN module with TNC antenna connector
Standards: IEEE 802.11a/b/g/n for wireless LAN
Connector Type: QMA connectors (female type) x 2
Mode: Client/AP

Cellular Module (Cinterion PH8)

Frequency Bands: GSM/GPRS/EDGE/UMTS/HSPA+
Band Options:
• Five-band UMTS (WCDMA/FDD)
• 800/850/1900 AWS and 2100 MHz
• Quad-band GSM: 850/900/1800/1900 MHz
HSDPA/HSUPA Data Rates:
DL: 3.6/7.2/14.4 Mbps; UL: 2.0/5.76 Mbps
UMTS Data Rates:
DL: 384 kbps (max.); UL:384 kbps (max.)
EDGE Class 12:
DL: 237 kbps (max.); UL: 237 kbps (max.)
GPRS Class 12:
DL: 85.6 kbps (max.); UL: 85.6 kbps (max.)
Connector Type: QMA connector (female type)

Serial Interface

Serial Standards: RS-232/422/485 software-selectable ports (DB9) x 2
Console Port: RS-232 (TxD, RxD, GND), 4-pin pin header output (115200, n, 8, 1)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (Automatic Data Direction Control) for RS-485
Baudrate: 50 bps to 921.6 kbps (supports nonstandard baudrates; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Digital Input
Input Channels: DI x 4
Input Voltage: 0 to 30 VDC
Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open
Digital Input Levels for Wet Contacts:
• Logic level 0: +3 V max.
• Logic level 1: +10 V to +30 V (COM to DI)
Connector Type: 10-pin screw-fastened terminal block (4 points, COM, GND)
Isolation: 2 kV optical isolation

Digital Output
Output Channels: DO x 4, sink type
Output Current: 200 mA (max.) per channel
On-State Voltage: 24 VDC nominal, open collector to 30 V
Connector Type: 10-pin screw-fastened terminal block (4 points, GND)

LEDs
System: Power, Ready, Storage, Programmable
LAN: 10M x 2, 100M x 2 (on connector)
Serial: TxD x 2, RxD x 2
Reset Button: Supports "Reset to Factory Default"

Physical Characteristics
Housing: SECC sheet metal (1 mm)
Weight: 1.2 kg (2.67 lb)
Dimensions: 200 x 57 x 120 mm (7.87 x 2.24 x 4.72 in)
Mounting: DIN rail, wall

Environmental Limits
Operating Temperature: -25 to 70°C (-13 to 158°F)
Storage Temperature: -40 to 80°C (-40 to 176°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: IEC 61373 standard
Anti-Shock: IEC 61373 standard

Power Requirements
Input Voltage: 24 VDC (9 to 48 V), M12 connector
Input Current: 833 mA @ 24 VDC
Power Consumption: 20 W

Standards and Certifications
Safety: UL 60950-1
EMC: EN 55022 Class A, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, FCC Part 15 Subpart B Class A
Rail Traffic: EN 50155*, EN 50121-3-2, EN 50121-4, IEC 61373
*Complies with a portion of EN 50155 specifications.

Reliability
Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)
Time:
MAR-2002-T: 280,129 hrs
MAR-2001-T: 350,609 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty
Warranty Period: 5 years (does not apply to cellular module)
Details: See www.moxa.com/warranty
Note: These hardware specifications describe the embedded computer unit itself, but not its official accessories. In particular, the wide temperature specification does not apply to accessories such as power adapters and cables.

Software Specifications

Linux
OS: Linux 3.8.13
Terminal Server (SSH): Provides secure encrypted communications between two untrusted hosts over an unsecure network
File System: JFFS2, NFS, Ext2, Ext3, Ext4, UBIFS
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv2, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, PPP
Internet Security: OpenVPN, IPTables Firewall, OpenSSL
Network Service: Moxa's Dynamic Routing and network management Web UI
GPS: Uses gpsd, which is a daemon that receives data from a GPS receiver, and provides the data back to multiple applications such as Kismet or GPS navigation software
Application Development Software:
• Moxa API Library (Moxa serial I/O control, Moxa DI/DO API)
• GNU C/C++ cross-compiler, supports EABI
• GNU C library
• GDB source-level debugging server
Software Protection: Encryption tool for user executable files (based on patented Moxa technology)

Ordering Information

Type	Models	
Model Name	MAR-2001-T	MAR-2002-T
Management Service		
MAR-2000 Web Management Utility	Available	
MAR-2000 Dynamic Routing	Available	
Storage		
CF Sockets	1	
Wireless		
Cellular 3G (WCDMA)	2 quad-band GSM/GPRS, EDGE, five-band UMTS/HSPA+ industrial IP-modems	3 quad-band GSM/GPRS, EDGE, five-band UMTS/ HSPA+ industrial IP-modems
Wi-Fi	2 IEEE 802.11a/b/g/n dual-RF wireless AP/bridge/client	1 IEEE 802.11a/b/g/n dual-RF wireless AP/bridge/client
GPS	50-channel GPS module	
Interface		
Ethernet Ports	2	
Serial Ports	2	
DI/DO	4 DIs, 4 DOs	
USB	2.0 host	
Environmental Limits		
Operating Temperature	-25 to 70°C (-13 to 158°F), (EN 50155 Class T3)	
Conformal Coating	Available by Request	

M12 Connectors (can be purchased separately)

M12A-5P-IP68: Field-installaable A-coded screw-fastened power connector, 5-pin female M12 connector, IP68-rated
M12D-4P-IP68: Field-installable D-coded screw-fastened Ethernet connector, 4-pin male M12 connector, IP68-rated

M12 Cables (can be purchased separately)

CBL-M12(FF5P)/Open-100 IP67: 1-meter A-coded M12-to-5-pin power cable, 5-pin female M12 connector, IP67-rated
CBL-M12D(MM4P)/RJ45-100 IP67: 1-meter D-coded M12-to-RJ45 Cat-5C UTP Ethernet cable, 4-pin male M12 connector, IP67-rated

WLAN Cable and Antenna

Cable: QMA (male) to SMA (male) adapter with 50 cm cable
Antenna: 2 dual-band omnidirectional antennas (2 dBi, RP-SMA, 2.4/5 GHz)

Cellular Cable and Antenna

Cable: QMA (male) to SMA (female) adapter with 50 cm cable
Antenna: Omni 1 dBi rubber SMA antenna

GPS Cable and Antenna

Cable: TNC to SMA (female) adapter with 50 cm cable
Antenna: 26 dBi, 1572 MHz, L1 band antenna

Package Checklist

- MAR-2000 programmable router
- Wall-mounting kit
- DIN-rail mounting kit
- CBL-4PINDB9F-100: 100 cm console port cable; 4 pin header connector to female DB9 connector
- Documentation and software CD or DVD
- Quick installation guide (printed)

W6000 Series

Preliminary

Compact, rugged, wireless computer with 3G/LTE, LAN, and 2 serial ports

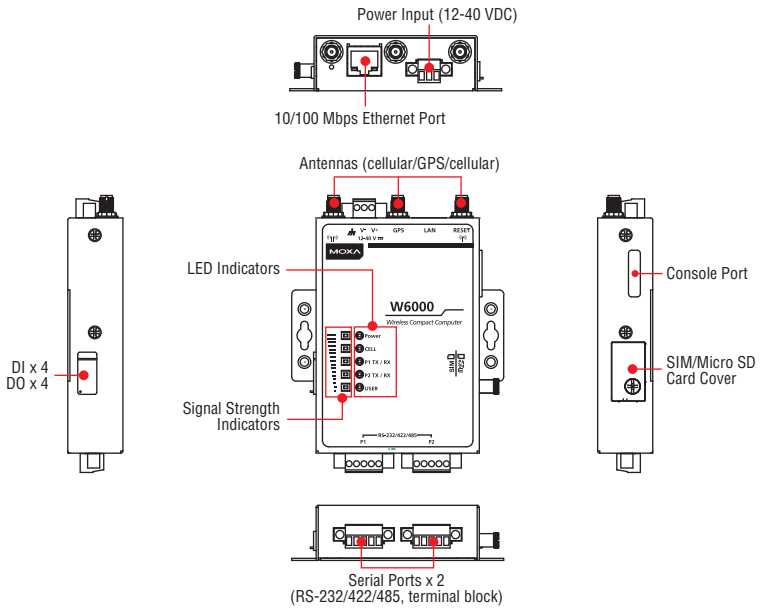
- ARMv7 Cortex-A8 processor with 512 MB RAM
- Built-in high speed HSPA+, LTE, and GPS support
- -40 to 70°C LTE operating temperature for harsh environments
- Compact size: 100 x 60 x 22 mm
- Auto-sensing 10/100 Mbps Ethernet port
- Dual software-selectable RS-232/422/485 serial ports
- MicroSD socket for storage expansion
- Debian ARM 8 open platform
- Keep alive session persistence
- Wireless, secure-router computer

Overview

The W6000 series computers are embedded Linux computers featuring 2 software selectable RS-232/422/485 ports, 1 Ethernet port, and LTE/US, HSPA, GPRS/GSM, and GPS for complex communication solutions. All W6000 computers come with a microSD socket for external storage expansion. The W6000 computers' Linux OS runs on the 32-bit ARM Cortex-A8 processor, which provides a powerful and reliable platform for harsh, industrial environments.

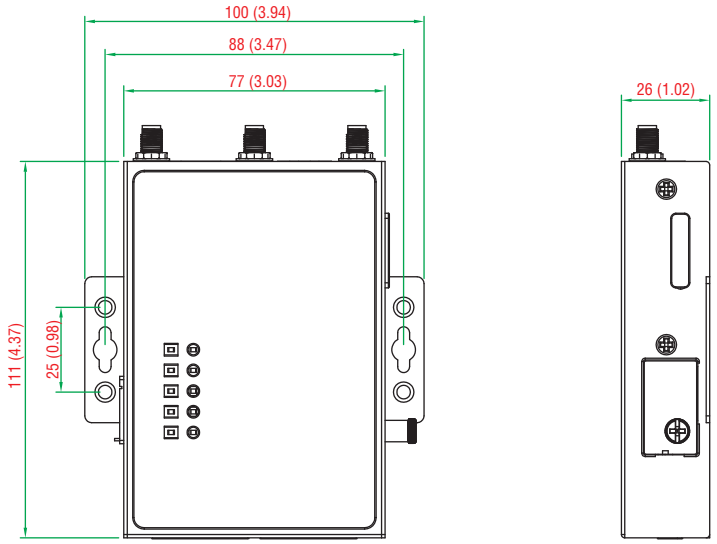
The W6000 is built around a low-power Cortex-A8 RISC processor and Debain ARM Linux OS that has been optimized for use in energy monitoring systems, but is widely applicable to a variety of industrial solutions. With powerful computing and multiple communication options, this tiny embedded computer is a reliable and secure gateway for data acquisition and processing at field sites as well as a useful communication platform to replace individual computers and routers for many other large-scale deployments.

Appearance



Dimensions

Unit: mm (inch)



Hardware Specifications

Computer

CPU: ARMv7 Cortex-A8 300 MHz (600 MHz, 1 GHz by project)
USB: USB 2.0 hosts x 1, type A connector
DRAM: DDR3 SDRAM: 512 MB
OS (pre-installed): Debian ARM 8 (Kernel 4.0)

Storage

Storage Expansion: MicroSD socket for storage expansion

Ethernet Interface

LAN: Auto-sensing 10/100 Mbps ports (RJ45) x 1
Magnetic Isolation Protection: 1.5 kV, built-in

Serial Interface

Serial Standards: RS-232/422/485 ports, software-selectable (5-pin terminal block connector) x 1 or 2
Console Port: RS-232 (TxD, RxD, GND), 4-pin pin header output (115200, n, 8, 1)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: XON/XOFF, ADDC® (Automatic Data Direction Control) for RS-485
Baudrate: 921600 bps (max.)

Serial Signals

RS-232: TxD, RxD, RTS, CTS, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Digital I/O

Digital Input: 3.3V/TTL digital inputs x 4
Digital Output: 3.3V/TTL digital outputs x 4

LEDs

System: Power x 1, cellular x 1, serial TX/RX x 2, signal strength x 5, user-defined x 1
LAN: 10M/100M on connector

Physical Characteristics

Housing: Aluminum (1 mm)
Weight: 875 g (1.94 lb)
Dimensions: 111 x 25 x 77 mm (4.37 x 0.98 x 3.03 in)
Mounting: Wall, DIN rail (with optional kit)

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 158°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: 2 Grms @ IEC 60068-2-64, random wave, 5-500 Hz, 1 hr per axis
Anti-Shock: 20 g @ IEC 60068-2-27, half sine wave, 30 ms

Power Requirements

Input Voltage: 9 to 40 VDC (3-pin terminal block, V+, V-, SG)
Input Current:
• 450 mA @ 12 VDC
• 225 mA @ 24 VDC
Power Consumption: 5.4 W

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class A
Green Product: RoHS, CRoHS, WEEE

Reliability

Alert Tools: Built-in RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Software Specifications

Linux

OS: Debian ARM 8 (Kernel 4.0)
Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML
Terminal Server (SSH): Provides secure encrypted communications between two untrusted hosts over an unsecure network
Kernel: GNU/Linux 4.0
System Shell: DASH (default), BASH
Text Editor: vim, nano
Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv2, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SSH, PPP, SFTP, RSYNC, SSL
Programming Language Support: PHP, Perl, Python
Internet Security Suite: OpenVPN, IPTables
Cryptographic Hardware Accelerators: AES, SHA, OpenSSL
Linux Board Support Packages (BSP):
• GCC C/C++ cross development tool chain
• Bootloader/ Kernel
Cellular Networking:
• WVDIAL: Point-to-Point Protocol dialer that dials a modem and uses the PPP protocol to connect to the Internet.
• QMI (Qualcomm MSM Interface): Glib-based library for talking to WWAN modems and devices that speak the Qualcomm MSM Interface (QMI) protocol.
• MODBUS: Software library to send/receive data according to the Modbus protocol. This library is written in C and supports RTU (serial) and TCP (Ethernet) communications.
• Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Linux standard API).
Cybersecurity:
• Secure Boot: A novel authentication algorithm proposed to secure platform integration. Only trusted Linux kernel and bootloader should be executed (Patent Pending).
• Sudo Mechanism: Sudo (sometimes considered short for super user do is a program designed to let system administrators allow some users to execute certain commands as the root user (or another user). The root user account is disabled by default. The basic philosophy is to give as few privileges as possible but still allow people to get their work.
• Security Update of Existing Software Packages: All software packages installed on the W6000 can be automatically updated using Debian Linux's Advanced Packaging Tool (APT) server or Moxa's server.
• microSD write protection: Provides a mechanism for disabling SD write permission to the microSD memory card plugged in directly into the card slot, or which is part of an extended storage system.

Ordering Information

Model	Antennas	Primary Network	Auxiliary Network	Serial Ports	LAN
W6393-T-LX-US	3	LTE-US	GPS	2	1
W6393-T-LX-EU	3	LTE-EU	GPS	2	1
W6273-T-LX	2	HSPA+	GPS	2	1

Optional Accessories

Antennas and Internal Antenna Cables		
GPS Antenna	ANT-GPS-OSM-05-3M	Active GPS antenna, 26 dBi, 1572 MHz, L1 band antenna for GPS
LTE Antenna	ANT-LTE-OSM-03-3m BK	Multi-band antenna that covers 700-2700 MHz frequencies. Specially designed for 2G, 3G, and 4G applications. Magnetic mounting is available.
LTE Antenna	ANT-LTE-ASM-04 BK	LTE Stick antenna that covers 704-960/1710-2620 MHz, providing omnidirectional radiation with a gain of 4.5 dBi.
LTE Antenna	ANT-LTE-ASM-05 BK	LTE stick antenna that covers 704-960/1710-2620 MHz with a gain of 5 dBi.
LTE Antenna	ANT-LTE-OSM-06-3m BK MIMO	Multi-band antenna that covers 700-2700/2400-2500/5150-5850 MHz frequencies. Screw-fastened mounting and full IP67 waterproofing are available.

Package Checklist

- W6000 embedded computer

UC-8100-ME-T Series

Preliminary

Communication-centric RISC computing platform

- ARMv7 Cortex-A8 1000 MHz processor
- Dual auto-sensing 10/100 Mbps Ethernet ports
- SD socket for storage expansion
- Programmable LEDs and a programmable button for easy installation and maintenance
- Mini PCIe socket for cellular module
- Debian ARM 7 open platform
- Cybersecurity
- -40°C to 70°C wide temperature range with LTE enabled

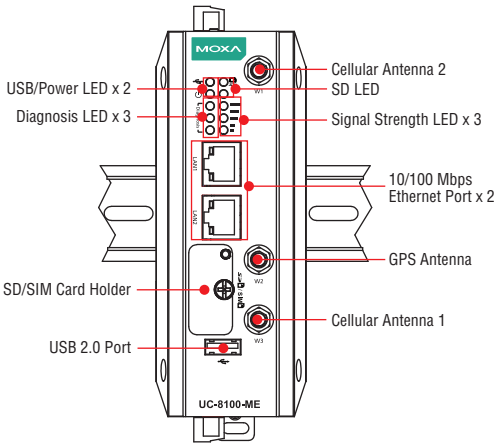
Overview

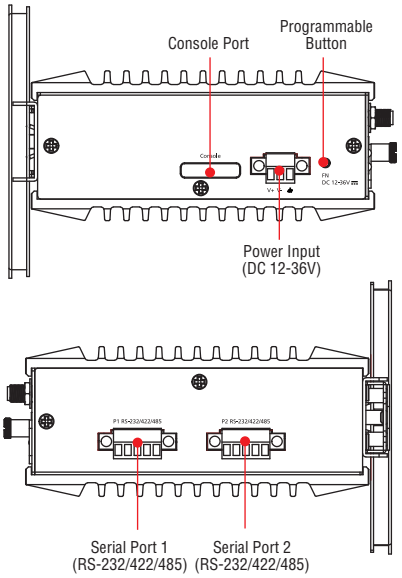
The UC-8100-ME-T computing platform is designed for embedded data acquisition applications. The computer comes with one or two RS-232/422/485 serial ports and dual 10/100 Mbps Ethernet LAN ports, as well as a Mini PCIe socket to support cellular modules. These versatile communication capabilities let users efficiently adapt the UC-8100-ME-T to a variety of complex communications solutions.

The UC-8100-ME-T is built around a Cortex-A8 RISC processor that has been optimized for use in energy monitoring systems, but is widely applicable to a variety of industrial solutions. With flexible interfacing options, this tiny embedded computer is a reliable and secure gateway for data acquisition and processing at field sites as well as a useful communication platform for many other large-scale deployments.

Wide temperature LTE-enabled models are available for extended temperature applications. All units are thoroughly tested in a testing chamber, guaranteeing that the LTE-enabled computing platforms are suitable for wide temperature applications.

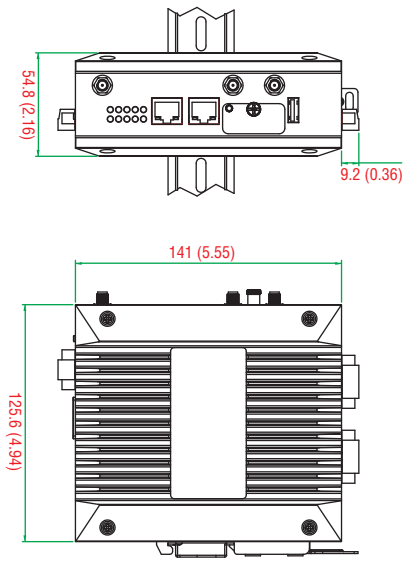
Appearance





Dimensions

Unit: mm (inch)



Hardware Specifications

Computer

CPU: ARMv7 Cortex-A8 1000 MHz
USB: USB 2.0 host x 1 (type A connector)
DRAM:
UC-8112-ME-T-LX: 512 MB DDR3 SDRAM
UC-8112-ME-T-LX-US: 512 MB DDR3 SDRAM
OS (pre-installed): Debian ARM 7 (Kernel 3.2)

Storage

Storage Expansion:
• SDHC/SDXC socket for storage expansion
• 4 GB eMMC flash with OS pre-installed

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (RJ45)
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface

Serial Standards: 1 or 2 RS-232/422/485 ports, software-selectable (5-pin terminal block connector)
Console Port: RS-232 (TxD, RxD, GND), 4-pin pin header output (115200, n, 8, 1)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 921600 bps (max.)

Serial Signals

RS-232: TxD, RxD, RTS, CTS, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

LEDs

System: Power x 1, USB x 1, SD x 1, signal strength x 3
LAN: 10M/100M on connector
Programmable: Diagnosis x 3

Switches and Buttons

Push Button: Initially configured to return a diagnostic report, and to reset the device to factory defaults

Physical Characteristics

Housing: SECC + Al 5052
Weight: 550 g (1.22 lb)
Dimensions: 141 x 119.9 x 36 mm (5.56 x 4.72 x 1.42 x in)
Mounting: DIN rail, wall (with optional kit)

Environmental Limits

Operating Temperature:
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Wide Temp. models (with LTE accessory): -40 to 70°C (-40 to 158°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: 2 Grms @ IEC 60068-2-64, random wave, 5-500 Hz, 1 hr per axis (without any USB devices attached)
Anti-Shock: 20 g @ IEC 60068-2-27, half sine wave, 30 ms

Power Requirements

Input Voltage: 12 to 24 VDC (3-pin terminal block, V+, V-, SG)
Input Current:
• 260 mA @ 12 VDC
• 135 mA @ 24 VDC
Power Consumption: 3.24 W (without cellular module and external USB device attached)

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class A
Green Product: RoHS, CRoHS, WEEE

Reliability

Alert Tools: External RTC (real-time clock)
Automatic Reboot Trigger: External WDT (watchdog timer)

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Software Specifications

Linux

OS: Debian ARM 8
Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML
Terminal Server (SSH): Provides secure encrypted communications between two untrusted hosts over an unsecure network
Kernel: GNU/Linux 4.0
System Shell: DASH (default), BASH
Text Editor: vim, nano
Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv2, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SSH, PPP, SFTP, RSYNC, SSL
Programming Language Support: PHP, Perl, Python
Internet Security Suite: OpenVPN, IPTables
Cryptographic Hardware Accelerators: AES, SHA, OpenSSL
Self Diagnosis: Check status of system and hardware component via software method
Linux Board Support Packages (BSP):
• GCC C/C++ cross development tool chain
• Bootloader/ Kernel/ filesystem
Cellular Networking:
• WVDIAL: Point-to-Point Protocol dialer that dials a modem and starts pppd to connect to the Internet.
• QMI (Qualcomm MSM Interface): Glib-based library for talking to WWAN modems and devices that speak the Qualcomm MSM Interface (QMI) protocol.
• MODBUS: Software library to send/receive data according to the Modbus protocol. This library is written in C and supports RTU (serial) and TCP (Ethernet) communications.
• Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Linux standard API).
Cybersecurity:
• Secure Boot: A novel authentication algorithm proposed to secure platform integration. Only trusted Linux kernel and bootloader should be executed (Patent Pending).
• SUDO Mechanism: Sudo (short for super-user do) is a program designed to let system administrators allow some users to execute certain commands as the root user (or another user). The root user account is disabled by default. The basic philosophy is to give as few privileges as possible but still allow people to get their work.
• Security Update of Existing Software Packages: All software packages installed on the UC-8100-ME-T can be automatically updated using Debian Linux's Advanced Packaging Tool (APT) server or Moxa's server.
• USB Protection: Provides a mechanism for disabling USB function to avoid USB stick malware attacks.
• SD Write Protection: Provides a mechanism for disabling write permission to the microSD memory card plugged in directly into the card slot, or which is part of an extended storage system.

Ordering Information

Model	CPU	RAM	Serial	Ethernet	SD Card Slot	USB	Operating Temperature
UC-8112-ME-T-LX	1 Ghz	512 MB	2	2	1	1	-40 to 85°C
UC-8112-ME-T-LX-LTE-US (LTE module pre-installed)	1 Ghz	512 MB	2	2	1	1	-40 to 70°C

Package Checklist

- UC-8100-ME-T embedded computer
- Power jack
- 3-pin terminal block for power
- 5-pin terminal block for UART x 2
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

Power Adapters, Power Cords, Console Cables

Model Name	Package Contents	Description
PWR-24250-DT-S1	• Power Adapter x 1	Power adapter for testing and system development indoors under ambient temperature conditions (input: 100 to 240 VAC, 50 to 60 Hz, 1.5 A; output: 24 VDC, 2.5 A, 60 W)
PWC-C7US-2B-183	• Power Cord x 1	10A/125V North American (US) power cord, 183 cm
PWC-C7EU-2B-183	• Power Cord x 1	10A/250V Continental European (EU) power cord, 183 cm
PWC-C7UK-2B-183	• Power Cord x 1	10A/250V United Kingdom (UK) power cord, 183 cm
PWC-C7AU-2B-183	• Power Cord x 1	2.5A/250V Australian (AU) power cord, 183 cm
PWC-C7CN-2B-183	• Power Cord x 1	10A/250V China (CN) power cord, 183 cm
CBL-F9DPF1x4-BK-100	• Console Cable x 1	Console cable with 4-pin connector

Wireless Packages

Model Name	Package Contents	Description
ME-CELLULAR-LTE-EU	• Cellular module x 1 • i-PEX MHF to SMA adapter with cable x 3 • Mini PCI/e mount screw sets x 2 • Heat sink x 1	LTE regions: Asia, Europe, Australia, New Zealand (compatible with LTE/EU, HSPA+, GPRS/GSM, and GPS) LTE: B1, B3, B7, B8, B20 UMTS/HSPA+: B1, B2, B5, B6, B8 GNSS (GPS+Glonass)
ME-CELLULAR-LTE-US	• Cellular module x 1 • i-PEX MHF to SMA adapter with cable x 3 • Mini PCI/e mount screw sets x 2 • Heat sink x 1	LTE regions: North America (compatible with LTE/US, HSPA, GPRS/GSM, and GPS) LTE: B2, B4, B5, B13, B17, B25 UMTS/HSPA+: B1, B2, B4, B5, B8 GNSS (GPS+Glonass)
ME-WiFi-BGN	• Wi-Fi module x 1 • i-PEX MHF to RP-SMA adapter with cable x 2 • Mini PCI/e mount screw sets x 2	(compatible with IEEE 802.11b/g/n) 2.4 Ghz only

Antennas and Internal Antenna Cables

Model Name	Package Contents	Description
ANT-GPS-OSM-05-3M	• GPS Antenna x 1	Active GPS antenna, 26 dBi, 1572 MHz, L1 band antenna for GPS
ANT-LTE-OSM-03-3m BK	• LTE Antenna x 1	Multi-band antenna that covers 700-2700 MHz. Specially designed for 2G, 3G, and 4G applications. Magnetic mounting is available.
ANT-LTE-ASM-04 BK	• LTE Antenna x 1	LTE Stick antenna that covers 704-960/1710-2620 MHz providing omnidirectional radiation with a gain of 4.5 dBi.
ANT-LTE-ASM-05 BK	• LTE Antenna x 1	LTE stick antenna that covers 704-960/1710-2620 MHz with a gain of 5 dBi.
ANT-LTE-OSM-06-3m BK MIMO	• LTE Antenna x 1	Multi-band antenna that covers 700-2700/2400-2500/5150-5850 MHz frequencies. Screw-fastened mounting and full IP67 waterproofing are available.
CRF-MHF/SMA(M)-14.2	• Wi-Fi Antenna x 1	RP-SMA male antenna for Wi-Fi; supports 2.4 Ghz band.
A-CRF-MHFSF	• Cellular antenna cable x 1	i-PEX MHF (male, on cellular module) to SMA (female, on top cover) adapter with cable. Used to install a GPS antenna or second cellular antenna.
CRF-MHF/SMA(M)-14.2	• Wi-Fi antenna cable x 1	i-PEX MHF (male, on cellular module) to RP-SMA (female, on top cover) adapter with cable. Used to install a second Wi-Fi antenna.

Mounting Kits

Model Name	Package Contents	Description
N/A	• Wall-mounting kit x 1	Wall-mounting kit with screws

UC-8410A Series

Preliminary

Highly efficient, security-enabled, wireless platform that supports a rich set of interfaces

- Freescale LS1021A Coretex-A7 1 GHz dual-core processor
- 512 MB DDR3 SDRAM
- 8 RS-232/422/485 serial ports
- 3 10/100/1000 Mbps Ethernet ports
- Wireless-enabled with PCIe mini slot
- 2 USB 2.0 hosts for mass storage devices
- DIN-rail or wall-mounting installation
- Robust, fanless design
- -40 to 75°C wide temperature model available
- Ready-to-run Debian ARM 8

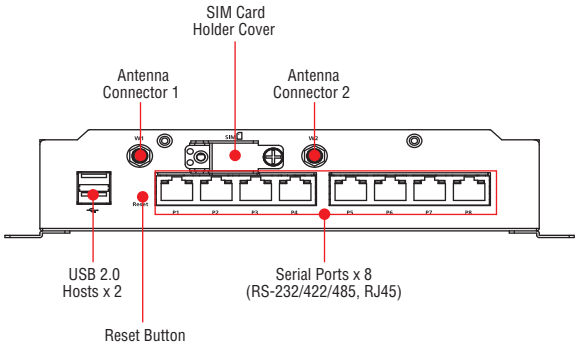
Overview

The UC-8410A Series embedded computers support a rich collection of communication interfaces, including 8 RS-232/422/485 serial ports, 3 Ethernet ports, 1 PCIe mini slot for a wireless module, 4 digital input channels, 4 digital output channels, 1 mSATA slot, and 2 USB 2.0 hosts.

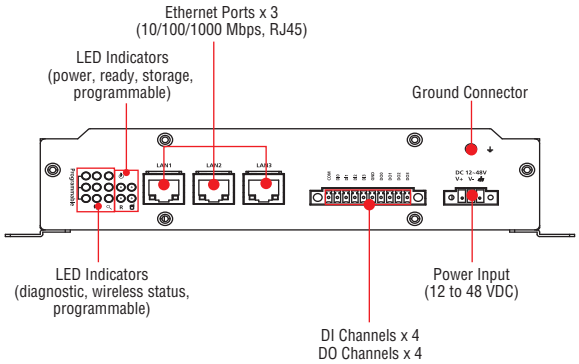
The UC-8410A computer uses the Freescale Cortex-A7 dual-core 1 GHz RISC CPU. This powerful computing engine supports several useful communications functions, without generating too much heat. The built-in 1 GB SD card and 512 MB DDR3 SDRAM give you enough memory to run your application software, and the mSATA slot provides the flexibility of adding additional data storage. The UC-8410A comes with a variety of communication interaces, including serial ports, Ethernet ports, wireless communication slot, and digital input/output channels, making them ideal as communication platforms for industrial applications that require network and device communications.

The UC-8410A Series comes with Linux Debian 8 pre-installed to provide an open software operating system for software program development. This makes the UC-8410A computer an optimal solution for use with industrial applications, but at minimal cost and effort. In addition to the standard model, a -40 to 75°C wide temperature model is also available for harsh industrial environments.

Appearance



Front View



Rear View

Hardware Specifications

Computer
CPU: ARMv7 Cortex-A7 dual-core 1 GHz
USB: USB 2.0 hosts x 2, Type A connector
DRAM: 512 MB DDR3 SDRAM onboard (up to 1 GB, by CV request)
OS (pre-installed): Debian ARM 8

Storage
Main Storage: 1 GB SD card for OS
Storage Expansion: mSATA slot

Ethernet Interface
LAN: Auto-sensing 10/100/1000 Mbps ports (RJ45) x 3
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface
Serial Standards: RS-232/422/485 software-selectable ports (8-pin RJ45) x 8
Console Port: RS-232 (TxD, RxD, GND), 4-pin header output (115200, n, 8, 1)

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 115.2 kbps (supports nonstandard baudrates; see user's manual for details)

Serial Signals
RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Digital Input
Input Channels: DI x 4
Input Voltage: 0 to 30 VDC
Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open
Digital Input Levels for Wet Contacts:
• Logic level 0: +10 to +30 V (COM to DI)
• Logic level 1: +3 V max.
Connector Type: 10-pin screw terminal block (4 points, COM, GND)
Isolation: 3 kV optical isolation

Digital Output
Output Channels: 4, sink type
Output Current: Max. 200 mA per channel
On-State Voltage: 24 VDC nominal, open-drain to 30 V
Connector Type: 10-pin screw terminal block (4 points, GND)
Isolation: 3 kV optical isolation

LEDs
System: Power, Ready, Storage, Diagnostic, Wireless signal strength
LAN: 100M/Link/Act x 3, 1000M/Link/Act x 3 (on connector)
Serial: TxD x 8, RxD x 8 (on connector)
Reset Button: Supports "Reset to Factory Default and System diagnostics"

Physical Characteristics
Housing: SECC sheet metal (1 mm)
Weight: 1 kg (2.21 lb)
Dimensions: 200 x 120 x 48.6 mm (7.87 x 4.72 x 1.91 in)
Mounting: DIN-rail, wall

Environmental Limits
Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature:
Standard Models: -20 to 75°C (-4 to 167°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: 2 Grms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis
Anti-Shock: 20 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements
Input Voltage: 12 to 48 VDC (3-pin terminal block)
Input Current:
• 1570 mA @ 12 VDC
• 420 mA @ 24 VDC
Power Consumption: 18 W

Standards and Certifications
Safety: UL 60950-1, CCC (GB9254, GB17625.1)
EMC: EN 55022 Class A, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class B

Reliability
Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty
Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adapter and cables.

Software Specifications

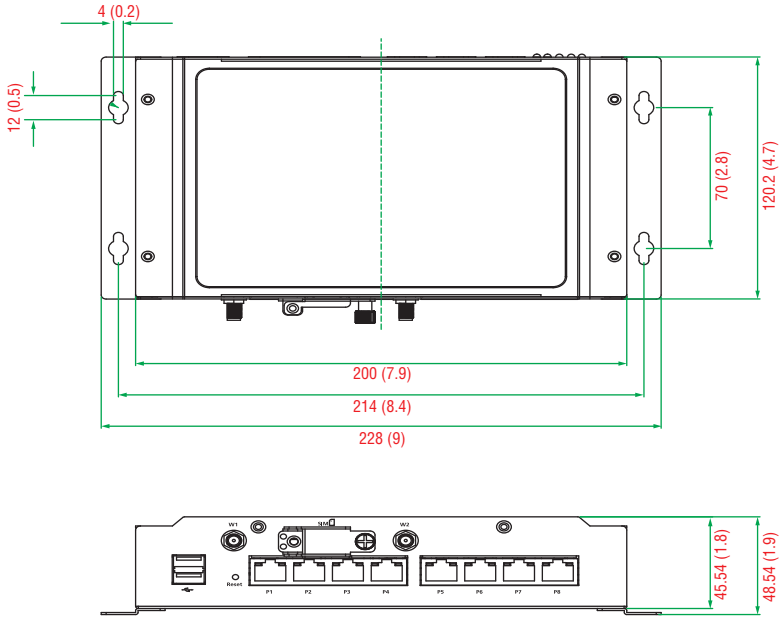
Linux

OS: Debian ARM 8
Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML
Terminal Server (SSH): SSH allows remote logins to a secure encrypted console from any connected network
Kernel:
GNU/Linux 3.12
System Shell: DASH, BASH
Text Editor: vim, nano
File System: Ext2, Ext3, Ext4
Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv2, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SSH, PPP, SFTP, RSYNC, SSL
Programming Language Support: PHP, Perl, Python
Internet Security: OpenVPN, iptables
Cryptographic Hardware Accelerators: AES, SHA, OpenSSL
Self Diagnosis: Check status of system and hardware component via software method

Linux Board Support Packages (BSP): GCC C/C++ cross development tool chain
Bootloader/ Kernel/ filesystem
Cellular Networking: Allows Unix machines to connect to the Internpppd to connect to the Internet.
Connect talcomm MSM Interface): Glib-based library for talking to WWAN modems and devices that speak the Qualcomm MSM Interface (QMI) protocol.
Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Linux standard provided)
Application Development Software:
• Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
• GNU C/C++ cross-compiler
• GNU C library
• GDB source-level debugging server
Software Protection: Encryption tool for user executable files (based on patented Moxa technology)

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

UC-8410A-LX: Cortext-A7 1 GHz dual-core RISC-based computer, 1 GB SD card, 512 MB DDR3L, serial ports x 8, DIs x 4, DOs x 4, LANs x 3, wireless enabled, mSATA slots x 1, USB, Debian ARM8, -10 to 60°C operating temperature
UC-8410A-T-LX: Cortex-A7 1 GHz dual-core RISC-based computer, 1 GB SD card, 512 MB DDR3L, serial ports x 8, DIs x 4, DOs x 4, LANs x 3, wireless enabled, mSATA slots x 1, USB, Debian ARM8, -40 to 75°C operating temperature

Package Checklist

- UC-8410A embedded computer
- Wall-mounting kit
- DIN-rail mounting kit
- Power jack
- 3-pin terminal block for power
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Embedded CPU Modules

Product Selection Guide

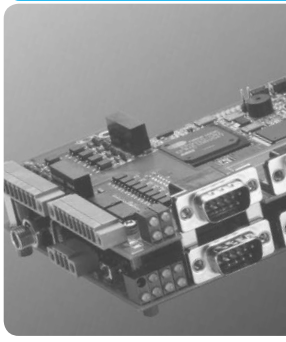
Embedded CPU Modules. 28-2

Embedded CPU Modules

EM-2260 Series: RISC embedded core modules with 4 serial port DI/DO, dual LANs, VGA, CompactFlash, USB 28-3

EM-1220 Series: RISC ready-to-run embedded core modules with 2 serial ports, dual LANs, SD. 28-6

EM-1240 Series: RISC ready-to-run embedded core modules with 4 serial ports, dual LANs, SD. 28-9



Embedded CPU Modules

	EM-2260-CE	EM-2260-LX	EM-1220-LX	EM-1220-T-LX	EM-1240-LX	EM-1240-T-LX
Computer						
CPU Speed	200 MHz	200 MHz	192 MHz	192 MHz	192 MHz	192 MHz
OS (pre-installed)	WinCE 6.0	Linux	Embedded µClinux	Embedded µClinux	Embedded µClinux	Embedded µClinux
DRAM	128 MB	128 MB	16 MB	16 MB	16 MB	16 MB
Flash	32 MB	32 MB	8 MB	8 MB	8 MB	8 MB
Digital I/O	8 DIs, 8 DOs	8 DIs, 8 DOs	10 GPIOs	10 GPIOs	10 GPIOs	10 GPIOs
Storage						
SD Slot	–	–	✓	✓	✓	✓
EIDE Interface	✓	✓	–	–	–	–
Display						
Graphics Controller	✓	✓	–	–	–	–
LAN Interface						
10/100 Mbps Ethernet Ports	2	2	2	2	2	2
Magnetic Isolation Protection	1.5 kV	1.5 kV	1.5 kV	1.5 kV	1.5 kV	1.5 kV
Serial Interface						
RS-232/422/485 Ports	4	4	2	2	4	4
ESD Protection	15 kV	15 kV	15 kV	15 kV	15 kV	15 kV
Console Port	✓	✓	✓	✓	✓	✓
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark					
Flow Control	RTS/CTS, XON/XOFF, ADDC®					
Baudrate	50 bps to 921.6 Kbps (nonstandard baudrates supported; see user's manual for details)					
Physical Characteristics						
Weight	70 g (0.16 lb)		40 g (0.09 lb)		50 g (0.11 lb)	
Dimensions	106 x 87 mm (4.17 x 3.43 in)		80 x 50 mm (3.15 x 1.97 in)		90 x 80 mm (3.54 x 3.15 in)	
Module Interface	–	–	Two 2 x 28 pin-headers (1.27 x 1.27 mm pitch)			
Environmental Limits						
Operating Temperature	-10 to 60°C (14 to 140°F)	-10 to 60°C (14 to 140°F)	-10 to 60°C (14 to 140°F)	-40 to 75°C (-40 to 167°F)	-10 to 60°C (14 to 140°F)	-40 to 75°C (-40 to 167°F)
Storage Temperature	-20 to 80°C (-4 to 176°F)	-20 to 80°C (-4 to 176°F)	-20 to 80°C (-4 to 176°F)	-40 to 85°C (-40 to 185°F)	-20 to 80°C (-4 to 176°F)	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Regulatory Approvals						
EMC	EN 55022 Class A, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A		CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)			
Green Product	RoHS, CRoHS, WEEE					
Reliability						
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓
Warranty	5 years (see www.moxa.com/warranty)					
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EM-2260 Series

RISC embedded core modules with 4 serial ports, 8 DIs, 8 DOs, dual LANs, VGA, CompactFlash, USB

- Cirrus Logic EP9315 ARM9 CPU, 200 MHz
- 128 MB RAM onboard, 32 MB flash disk
- Graphical interface for external VGA output connection
- 2 kV optically isolated RS-232/422/485 serial ports
- Dual 10/100 Mbps Ethernet ports for network redundancy
- 8 DI and 8 DO channels
- Supports CompactFlash and USB 2.0 hosts
- Ready-to-run WinCE 6.0 platform
- Full-function development kit for quick evaluation and application development

Overview

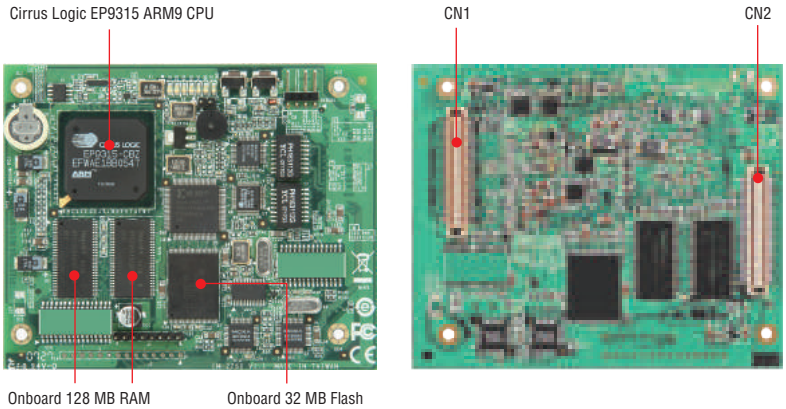
The EM-2260 embedded module features 4 RS-232/422/485 serial ports, dual Ethernet ports, and an EIDE interface for designing an external storage connection, such as a CompactFlash socket or USB port signals. The module has a compact design that is easily integrated with a variety of industrial applications, including gas stations, vending machines, and ticketing machines, and offers a powerful serial communication capability for better system integration. Programmers will find the pre-installed, ready-to-run Windows CE 6.0 platform and full-function development kit a great benefit when developing software and building reliable communication bases for industrial automation applications.

The EM-2260 embedded module uses the Cirrus Logic EP9315 ARM9, 32-bit, 200 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but will not generate a lot of heat. The built-in 32 MB NOR Flash ROM and 128 MB SDRAM give you enough memory to run your application software directly on the EM-2260. With its built-in VGA output interface, the EM-2260 is suitable for use with SCADA systems in industrial applications, such as manufacturing automation, production line process monitoring, and mining automation, that require VGA and HMI features.

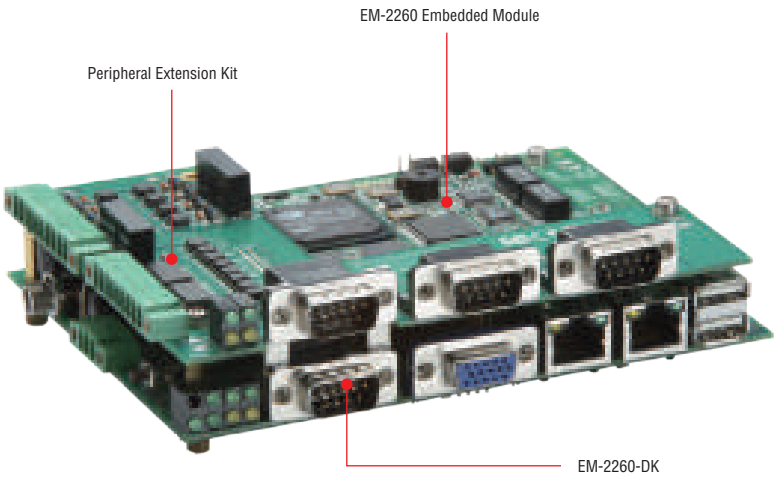
The EM-2260 Development Kit provides users with a handy tool for first time evaluation to test the functionality of the embedded core module. It has several peripherals built-in, including RS-232/422/485 ports and digital input and output, making it suitable for developing a variety of industrial applications.

Appearance

EM-2260 Embedded Module



Development Kit



Hardware Specifications

Computer
CPU: Cirrus Logic EP9315 ARM9 CPU, 200 MHz
DRAM: SDRAM, 128 MB
Flash: NOR Flash, 32 MB
OS (pre-installed): Linux or Windows CE 6.0

Storage
Storage Expansion: EIDE interface for connecting up to 2 external devices

Display
Graphics Controller: EP9315 internal graphics accelerator engine with TTL graphical signal support
Display Memory: Dynamic video memory (shares system memory)
Resolution: 1024 x 768, 8 bits

Ethernet Interface
LAN: Auto-sensing 10/100 Mbps ports (RJ45) x 2
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface
Serial Standards: RS-232/422/485 ports x 4, software-selectable
Console Port: RS-232 (TxD, RxD, GND), 4-pin pin header output

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 kbps (supports nonstandard baudrates; see user's manual for details)

Serial Signals
TTL: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Digital Input
Input Channels: DI x 8
Input Voltage: 3.3 V, CMOS level

Digital Output
Output Channels: DO x 8
Digital Output Levels: 3.3 V, CMOS level

Switches and Buttons
Reset Button: Supports "Reset to Factory Default"

Physical Characteristics
Weight: 70 g (0.16 lb)
Dimensions: 106 x 87 mm (4.17 x 3.43 in)

Environmental Limits
Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -20 to 80°C (-4 to 176°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements
Input Voltage: 12 VDC
Input Current: 480 mA @ 12 VDC
Power Consumption: 5.8 W

Standards and Certifications
EMC: EN 55022 Class A, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A
Green Product: RoHS, CRoHS, WEEE

Reliability
Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)
Time: 131,832 hrs
Standard: Telcordia (Bellcore) Standard

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Software Specifications

Linux

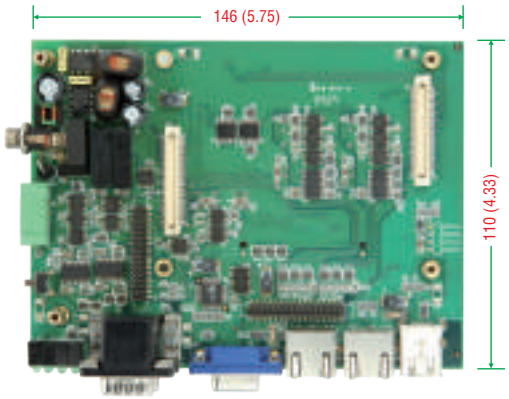
OS: Linux 2.6.23
Web Server (Apache): Allows you to create and manage web sites
Terminal Server (SSH): Provides secure encrypted communications between two untrusted hosts over an unsecure network
File System: JFFS2, NFS, Ext2, Ext3
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, IPTables Firewall
Dial-up Networking: PPP Daemon (pppd) for Linux that uses the PPP protocol and allows Unix machines to connect to the Internet as PPP servers or clients, through dialup. The PPP Daemon works with chat, dip, and diald programs among others, and supports the IP, TCP, UDP, and IPX for Linux (Novell) protocols.
Watchdog: Features a hardware function to trigger system reset based on a user-specified time interval (Moxa API provided)
Application Development Software:
• Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
• GNU C/C++ cross-compiler
• GNU C library
• GDB source-level debugging server
Software Protection: Encryption tool for user executable files (based on patented Moxa technology)

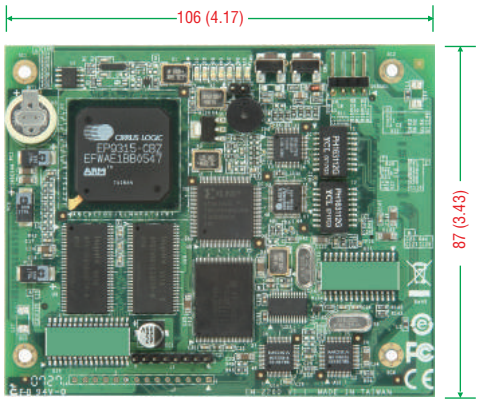
Windows Embedded CE 6.0

OS: Windows Embedded CE 6.0
File System: FAT (for onboard flash)
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP
Web Server (WinCE IIS): Supports ASP, ISAPI Secure Socket Layer (SSL 2/3) and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions
Dial-up Networking: Supports RAS client API and PPP, Extensible Authentication Protocol (EAP), and RAS scripting
File Server: Enables remote clients to access files and other resources over the network
Watchdog: Features a hardware function to trigger system reset based on a user-specified time interval. (Moxa API provided)
Application Development Software:
• Moxa WinCE 6.0 SDK
• Moxa API Library
• C Libraries and Run-times
• Component Services (COM and DCOM)
• Microsoft® .NET Compact Framework 2.0
• XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
• SOAP Toolkit Client
• Winsock 2.2

Dimensions

Unit: mm (inch)





Ordering Information

Available Models

EM-2260-CE: RISC-based embedded core module with 4 serial ports, 8 DI and 8 DO channels, dual LANs, VGA, CompactFlash, USB, WinCE 6.0 OS
EM-2260-LX: RISC-based embedded core module with 4 serial ports, 8 DI and 8 DO channels, dual LANs, VGA, CompactFlash, USB, Linux OS

Development Kits (can be purchased separately)

EM-2260-CE Development Kit: Includes the EM-2260-CE module and EM-2260-DK carrier board for testing and application development
EM-2260-LX Development Kit: Includes the EM-2260-LX module and EM-2260-DK carrier board for testing and application development

Package Checklist (modules)

- EM-2260-CE or EM-2260-LX module

Package Checklist (development kits)

- EM-2260 module
- EM-2260-DK, the carrier board for the EM-2260 module
- Universal power adapter set
- Ethernet cable: RJ45-to-RJ45 cross-over cable, 100 cm
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

EM-1220 Series

RISC ready-to-run embedded core modules with 2 serial ports, dual LANs, SD

- MOXA ART ARM9 32-bit 192 MHz processor
- 16 MB RAM, 8 MB flash disk onboard
- 2 software-selectable RS-232/422/485 serial ports
- Dual 10/100 Mbps Ethernet ports for network redundancy
- SD signals supported for external SD socket connection
- Built-in RTC, buzzer
- 10 GPIOs reserved for system integration
- Ready-to-run µClinux Kernel 2.6 platform
- Full-function development kit for quick evaluation and application development
- -40 to 75°C wide temperature models available

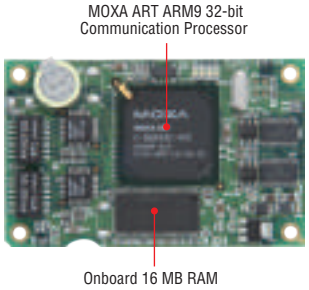
Overview

The EM-1220 embedded module features 2 RS-232/422/485 serial ports, dual Ethernet ports, and an SD socket for external storage expansion. The module has a compact design that can be easily integrated with industrial applications such as gas stations, vending machines, and ticketing machines, and offers a powerful serial communication capability for better system integration. Programmers will find that the pre-installed, ready-to-run µClinux platform and the full-function development kit make it easy to develop software and build a reliable communication base for industrial automation applications. In addition, a wide temperature model is also available to provide a reliable solution for harsh environments.

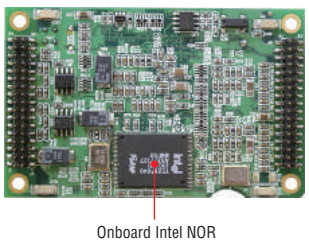
Appearance

EM-1220 Embedded Module

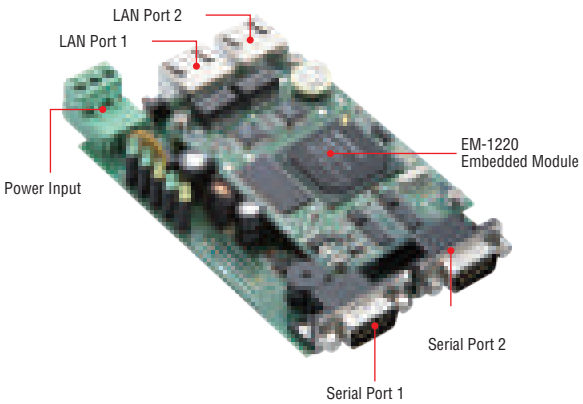
Top View



Bottom View



Development Kit



Hardware Specifications

Computer
CPU: MOXA ART ARM9 32-bit, 192 MHz
DRAM: SDRAM, 16 MB
Flash: NOR Flash, 8 MB
OS (pre-installed): Linux

Storage
Storage Expansion: SD sockets x 1

Ethernet Interface
LAN: Auto-sensing 10/100 Mbps ports (RJ45) x 2
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface
Serial Standards: RS-232/422/485 x 2, software-selectable
ESD Protection: 15 kV for all signals
Console Port: TTL signal, 4-pin pin header output

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 kbps (supports nonstandard baudrates; see user's manual for details)

Serial Signals
RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

LEDs
System: Ready
LAN: 10M/Link x 2, 100M/Link x 2
Serial: TxD x 2, RxD x 2

Physical Characteristics
Weight:
• EM-1220 Module: 40 g (0.09 lb)
• EM-1220 Development Kit: 120 g (0.27 lb)
Dimensions:
• EM-1220 Module: 80 x 50 mm (3.15 x 1.97 in)
• EM-1220 Development Kit: 117 x 70 mm (4.61 x 2.76 in)
Module Interface: Two 2-by-17 pin-headers (2.5 x 2.5 mm pitch)

Environmental Limits
Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements
Input Voltage: 3.3 VDC
Input Current: 625 mA @ 3.3 VDC
Power Consumption: 2.1 W

Standards and Certifications
EMC: EN 55022 Class A, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A
Green Product: RoHS, CRoHS, WEEE

Reliability
Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)
Time: 405,735 hrs
Standard: Telcordia (Bellcore) Standard

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty
Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adapter and cables.

Software Specifications

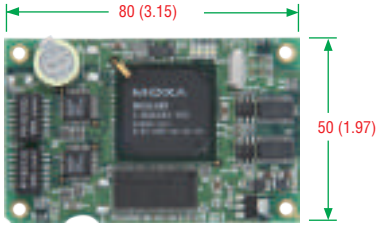
µClinux
OS: µClinux 2.6.19
File System: JFFS2
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, TFTP, PPP, PPPoE
Web Server (Boa): Allows you to create and manage web sites
Terminal Server (Telnet): Provides telnet communications between two hosts over the network

Dial-up Networking: PPP Daemon (pppd) for Linux that uses the PPP protocol and allows Unix machines to connect to the Internet as PPP servers or clients, through dialup. The PPP Daemon works with chat, dip, and diald programs among others, and supports the IP, TCP, UDP, and IPX for Linux (Novell) protocols.
Application Development Software:
• Moxa API Library (Watchdog timer, Moxa serial I/O control)
• arm-elf-gcc: C/C++ cross-compiler
• µClibc: POSIX standard C library

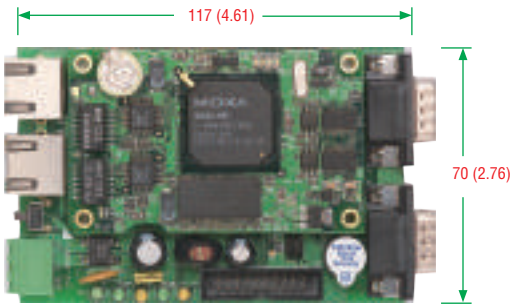
Dimensions

Unit: mm (inch)

EM-1220



EM-1220-DK



Ordering Information

Available Modules

EM-1220-LX: RISC-based embedded core module with 2 serial ports, dual LANs, SD, µClinux, -10 to 60°C operating temperature
EM-1220-T-LX: RISC-based embedded core module with 2 serial ports, dual LANs, SD, µClinux, -40 to 75°C operating temperature

Development Kits (can be purchased separately)

EM-1220 Development Kit: Includes the EM-1220-DK snap-on testing board with built-in RJ45 LAN ports and DB9 male serial ports

Package Checklist (modules)

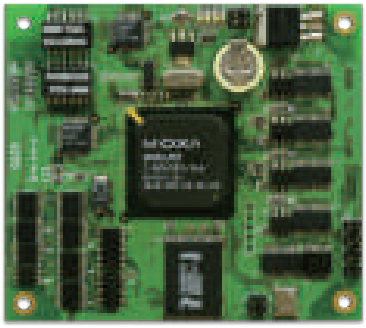
- EM-1220 module

Package Checklist (development kits)

- EM-1220 module
- EM-1220-DK, the carrier board for the EM-1220 module
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- Universal power adapter (including terminal block to power jack converter)
- Ethernet cable: RJ45-to-RJ45 cross-over cable, 100 cm
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

EM-1240 Series

RISC ready-to-run embedded core modules with 4 serial ports, dual LANs, SD



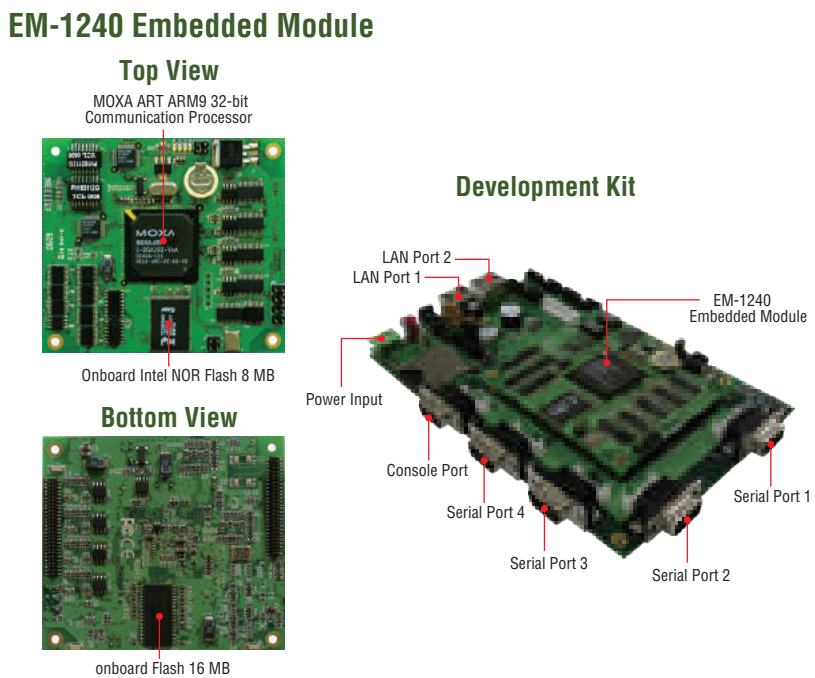
- MOXA ART ARM9 32-bit 192 MHz processor
- 16 MB RAM, 8 MB flash disk onboard
- 4 software-selectable RS-232/422/485 serial ports
- Dual 10/100 Mbps Ethernet ports for network redundancy
- SD signals supported for external SD socket connection
- Built-in RTC, buzzer
- 10 GPIOs reserved for system integration
- Ready-to-run µClinux Kernel 2.6 platform
- Full-function development kit for quick evaluation and application development
- -40 to 75°C wide temperature models available

Overview

The EM-1240 embedded module features 4 RS-232/422/485 serial ports, dual Ethernet ports, and an SD socket for external storage expansion. The modules have a compact design that can be easily integrated with industrial applications such as gas stations, vending machines, and ticketing machines, and offer a powerful serial communication capability for better system integration. Programmers will find that the pre-installed, ready-to-run µClinux platform and the full-function development kit make it easy to develop software and build a reliable communication base for industrial automation applications. In addition, a wide temperature model is also available to provide a reliable solution for harsh environments.

Appearance

EM-1240 Embedded Module



Hardware Specifications

Computer
CPU: MOXA ART ARM9 32-bit, 192 MHz
DRAM: SDRAM, 16 MB
Flash: NOR Flash, 8 MB
OS (pre-installed): Linux

Storage
Storage Expansion: SD sockets x 1

Ethernet Interface
LAN: Auto-sensing 10/100 Mbps ports (RJ45) x 2
Magnetic Isolation Protection: 1.5 kV, built-in

Serial Interface
Serial Standards: RS-232/422/485 x 4, software-selectable
ESD Protection: 15 kV for all signals
Console Port: RS-232 (all signals), RJ45 connector

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 kbps (supports nonstandard baudrates; see user's manual for details)

Serial Signals
RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

LEDs
System: Ready
LAN: 10M/Link x 2, 100M/Link x 2
Serial: TxD x 2, RxD x 2

Physical Characteristics
Weight:
• EM-1240 Module: 50 g (0.11 lb)
• EM-1240 Development Kit: 200 g (0.44 lb)
Dimensions:
• EM-1240 Module: 90 x 80 mm (3.54 x 3.15 in)
• EM-1240 Development Kit: 177 x 115 mm (6.97 x 4.53 in)
Module Interface: Two 2 x 28 pin-headers (1.27 x 1.27 mm pitch)

Environmental Limits
Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements
Input Voltage: 5 VDC
Input Current: 500 mA @ 5 VDC
Power Consumption: 2.5 W

Standards and Certifications
EMC: EN 55022 Class A, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A

Reliability
Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)
Time: 385,419 hrs
Standard: Telcordia (Bellcore) Standard

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty
Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adapter and cables.

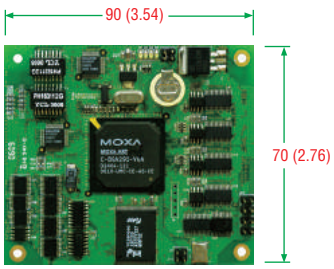
Software Specifications

µClinux
OS: µClinux 2.6.19
File System: JFFS2
Internet Protocol Suite: ARP, ICMP, IPV4, TCP, UDP, FTP, Telnet, SNMP V1, HTTP, CHAP, PAP, DHCP, NTP, NFS V2, SMTP, Telnet, PPP, PPPoE
Web Server (Boa): Allows you to create and manage web sites
Terminal Server (Telnet): Provides telnet communications between two hosts over the network
Dial-up Networking: PPP Daemon (pppd) for Linux that uses the PPP protocol and allows Unix machines to connect to the Internet as PPP servers or clients, through dialup. The PPP Daemon works with chat, dip, and diald programs among others, and supports the IP, TCP, UDP, and IPX for Linux (Novell) protocols.
Application Development Software:
• Moxa API Library (Watchdog timer, Moxa serial I/O control)
• arm-elf-gcc: C/C++ cross-compiler
• µClibc: POSIX standard C library

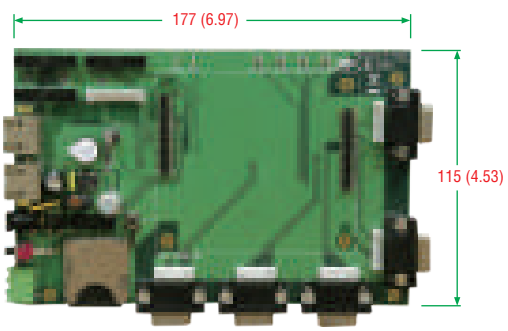
Dimensions

Unit: mm (inch)

EM-1240



EM-1240-DK



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Development Kits (can be purchased separately)

EM-1240 Development Kit: Includes the EM-1240-DK snap-on testing board with built-in RJ45 LAN ports and DB9 male serial ports

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- EM-1240 module

Package Checklist (development kits)

- EM-1240 module
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- Universal power adapter (including terminal block to power jack converter)
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- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Accessories

Serial Connection Options

Serial Board Connection Box/Cable Usage Chart A-2
8-port RS-232 Connection Boxes A-3
8-port RS-232 Connection Cables. A-3
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4-port Connection Cables A-4
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Power Accessories

Power Adapters and Power Cords A-6
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Fiber Accessories

Fiber Optic Adapters A-12

Caps, Connectors, Mounting Kits

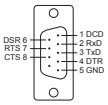
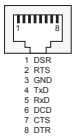
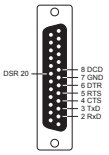
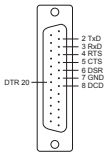
Caps. A-13
Connectors A-13
Mounting Kits A-14

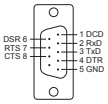
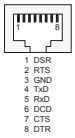
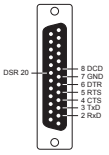
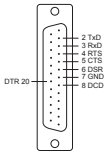
Serial Connection Options

Serial Board Connection Box/Cable Usage Chart

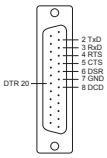
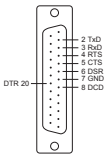
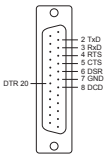
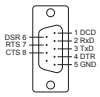
Serial Board Model Name	Connection Boxes						Connection Cables													
	8-port						8-port						4-port						2-port	
	OPT8-M9	OPT8-RJ45	OPT8A/B/S	OPT8-M9+	OPT8A+/B+/S+	OPT8-RJ45+	CBL-M68M25x8-100 (OPT8C+)	CBL-M68M9x8-100 (OPT8D+)	CBL-M62M25x8-100 (OPT8C)	CBL-M62M9x8-100 (OPT8D)	CBL-M78M25x8-100	CBL-M78M9x8-100	CBL-M44M9x4-50	CBL-M44M9x4-50(POS)	CBL-M44M25x4-50	CBL-M37M9x4-30 (OPT4C)	CBL-M37M9x4-30 (OPT4D)	CBL-F40M25x4-50	CBL-M25M9x2-50	CBL-F20M25x2-50
C218Turbo Series	✓	✓	✓	–	–	–	–	–	✓	✓	–	–	–	–	–	–	–	–	–	–
C104H Series	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	–	–	–
CI-134 Series	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	–	–	–
CP-118U	✓	✓	✓	–	–	–	–	–	✓	✓	–	–	–	–	–	–	–	–	–	–
CP-138U	✓	✓	✓	–	–	–	–	–	✓	✓	–	–	–	–	–	–	–	–	–	–
CP-168U	✓	✓	✓	–	–	–	–	–	✓	✓	–	–	–	–	–	–	–	–	–	–
C168H Series	✓	✓	✓	–	–	–	–	–	✓	✓	–	–	–	–	–	–	–	–	–	–
CP-104UL	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	✓	–	–	–	–	–
CP-134U Series	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	✓	–	–	–	–	–
CP-114UL	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	✓	–	–	–	–	–
CP-114UL-I	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	✓	–	–	–	–	–
CP-104EL-A	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	✓	–	–	–	–	–
CP-114EL	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	✓	–	–	–	–	–
CP-114EL-I	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	✓	–	–	–	–	–
CP-112UL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–
CP-112UL-I	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–
CP-132UL Series	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–
CP-102UL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–
CP-102EL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–
CP-132EL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–
CP-132EL-I	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–
CP-118EL-A	–	–	–	✓	✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–
CP-168EL-A	–	–	–	✓	✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–
CP-118U-I	–	–	–	–	–	–	–	–	–	–	✓	✓	–	–	–	–	–	–	–	–
CP-138U-I	–	–	–	–	–	–	–	–	–	–	✓	✓	–	–	–	–	–	–	–	–
POS-104UL	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	–	–	–	–	–
CA-108	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	–
CB-108	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	–
CA-114	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	–
CB-114	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	–
CA-134I	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	–
CB-134I	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	–
CA-104	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	–
CA-132	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓
CA-132I	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓

8-port RS-232 Connection Boxes

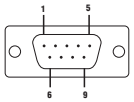
Model Name	OPT8-M9	OPT8-RJ45	OPT8A/S	OPT8B
Accessories Image				
Pin Assignment				
Board-Side Connector	DB62 male x 1			
Device-Side Connector	DB9 male x 8	8-pin RJ45 x 8	DB25 female x 8	DB25 male x 8
LEDs	TxD, RxD indicators for each device-side port	–	TxD, RxD indicators for each device-side port	
Baudrate	–	–	50 bps to 921.6 kbps	
Dimensions	90 x 111 x 27.5 mm (3.5 x 4.3 x 1 in)	152.8 x 32.8 x 32 mm (6 x 1.29 x 1.25 in)	247 x 108 x 35 mm (9.7 x 4.3 x 1.4 in)	
Protection	–	–	25 kV ESD, 2 KV EFT surge protection (OPT8S only)	–
Connnection Cable	DB62 male to DB62 female 150 cm connection cable for connecting to the serial board	–	DB62 male to DB62 male 150 cm connection cable for connecting to the serial board	
Related Products	See page A-2 for details			

Model Name	OPT8-M9+	OPT8-RJ45+	OPT8A+/S+	OPT8B+
Accessories Image				
Pin Assignment				
Board-Side Connector	VHDCI 68 x 1			
Device-Side Connector	DB9 male x 8	8-pin RJ45 x 8	DB25 female x 8	DB25 male x 8
LEDs	TxD, RxD indicators for each device-side port	–	TxD, RxD indicators for each device-side port	
Baudrate	–	–	50 bps to 921.6 kbps	
Dimensions	90 x 111 x 27.5 mm (3.5 x 4.3 x 1 in)	152.8 x 32.8 x 32 mm (6 x 1.29 x 1.25 in)	247 x 108 x 35 mm (9.7 x 4.3 x 1.4 in)	
Protection	–	–	25 kV ESD, 2 kV EFT surge protection (OPT8S only)	–
Connnection Cable	DB68 male to DB62 female 150 cm connection cable for connecting to the serial board	–	DB68 male to DB62 male 150 cm connection cable for the connecting to the serial board	
Related Products	See page A-2 for details			

8-port RS-232 Connection Cables

Model Name	CBL-M62M25x8-100 (OPT8C)	CBL-M62M9x8-100 (OPT8D)	CBL-M68M25x8-100 (OPT8C+)	CBL-M68M9x8-100 (OPT8D+)	CBL-M78M25x8-100	CBL-M78M9x8-100
Accessories Image						
Pin Assignment						
Board-Side Connector	DB62 male x 1		VHDCI 68 x 1		DB78 male x 1	
Device-Side Connector	DB25 male x 8	DB9 male x 8	DB25 male x 8	DB9 male x 8	DB25 male x 8	DB9 male x 8
Cable Length	100 cm (39.37 in)					
Related Products	See page A-2 for details					

2-port Connection Cables

Model Name	CBL-M25M9x2-50
Accessories Image	
Pin Assignment	
Description	DB25 male to DB9 male x 2
Cable Length	50 cm (19.69 in)
Related Products	See page A-2 for details

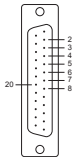
PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

4-port Connection Cables

Model Name	CBL-M44M9x4-50	CBL-M44M25x4-50
Accessories Image		
Description	DB44 male to DB9 male x4	DB44 male to DB25 male x4
Cable Length	50 cm (19.69 in)	
Related Products	See page A-2 for details	

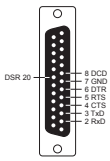
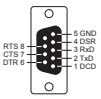
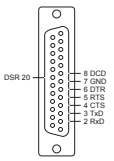
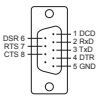
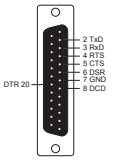
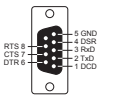
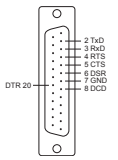
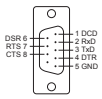
Pin Assignment

PIN	RS-232	RS-422	RS-485-4w	RS-485-2w
1	DCD	TxD-(A)	TxD-(A)	–
2	RxD	TxD+(B)	TxD+(B)	–
3	TxD	RxD+(B)	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	RxD-(A)	Data-(A)
5	GND	GND	GND	GND
6	DSR	–	–	–
7	RTS	–	–	–
8	CTS	–	–	–
9	–	–	–	–

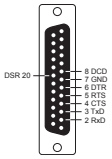
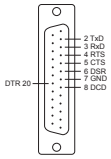
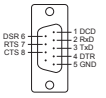
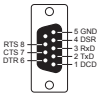


PIN	RS-232	RS-422	RS-485-4w	RS-485-2w
2	TxD	RxD+(B)	RxD+(B)	Data+(B)
3	RxD	TxD+(B)	TxD+(B)	–
4	RTS	–	–	–
5	CTS	–	–	–
6	DSR	–	–	–
7	GND	GND	GND	GND
8	DCD	TxD-(A)	TxD-(A)	–
20	DTR	RxD-(A)	RxD-(A)	Data-(A)
22	–	–	–	–

8-pin RJ45 to DB9/DB25 Connection Cables

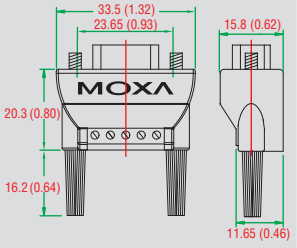
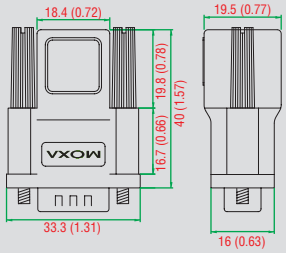
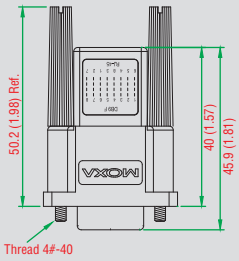
Model Name	CBL-RJ45F25-150	CBL-RJ45F9-150	CBL-RJ45M25-150	CBL-RJ45M9-150	CBL-RJ45SF25-150	CBL-RJ45SF9-150	CBL-RJ45SM25-150	CBL-RJ45SM9-150
Accessories Image								
Pin Assignment								
Cable Type	-	-	-	-	Shielded			
Board-Side Connector	8-pin RJ45 x 1							
Device-Side Connector	DB25 female x 1	DB9 female x 1	DB25 male x 1	DB9 male x 1	DB25 female x 1	DB9 female x 1	DB25 male x 1	DB9 male x 1
Cable Length	150 cm (59.06 in)							
Related Products	CP-104JU, OPT8-RJ45, NPort 5210, NPort 5600, NPort 6600, CN2510/2600							

10-pin RJ45 to DB9/DB25 Connection Cables

Model Name	CN20030	CN20040	CN20060	CN20070
Accessories Image				
Pin Assignment				
Board-Side Connector	10-pin RJ45 x 1			
Device-Side Connector	DB25 female x 1	DB25 male x 1	DB9 male x 1	DB9 female x 1
Cable Length	150 cm (59.06 in)			
Related Products	C320Turbo Series, A52, A53			

Wiring Kits

Model Name	TB-M9	TB-F9	TB-M25	TB-F25
Accessories Image				
Type	DB9 male DIN-rail wiring terminal	DB9 female DIN-rail wiring terminal	DM25 male DIN-rail wiring terminal	DB25 female DIN-rail wiring terminal
Connector	DB9 male	DB9 female	DB25 male	DB25 female
Rating	300 V, 20 A (IEC250V 10A)			
Operating Temperature	-40 to 105°C (-40 to 221°F)			
Suitable Wiring	24-12 AWG (IEC 0.5-2.5 mm²)			
Dimensions	77.5 x 45 x 51 mm (3.05 x 1.77 x 2.01 in)		77.5 x 90 x 51 mm (3.05 x 3.54 x 2.01 in)	

Model Name	Mini DB9F-to-TB	ADP-RJ458P-DB9M	ADP-RJ458P-DB9F	A-ADP-RJ458P-DB9F-ABC01
Accessories Image				
Pin Assignment	DB9-F / TB 1 / 2 2 / 1 3 / 3 4 / 4 5 / 5	DB9-M / RJ45 1 / 6 2 / 5 3 / 4 4 / 8 5 / 3 6 / 1 7 / 2 8 / 7	DB9-F / RJ45 1 / 6 2 / 4 3 / 5 4 / 1 5 / 3 6 / 8 7 / 7 8 / 2	DB9 / RJ45 1 / 6 2 / 5 3 / 4 4 / 8 5 / 7 6 / 1 7 / 2 8 / 7
Description	DB9 female to terminal block adapter for RS- 422/485 applications	RJ45-toDB9 male adapter	RJ45-toDB9 female adapter	RJ45-toDB9 female adapter
Operating Temperature	0 to 70°C (32 to 158°F)	-15 to 70°C (5 to 158°F)	-15 to 70°C (5 to 158°F)	0 to 70°C (32 to 158°F)
Dimensions				

Power Accessories

AC Power Supplies

Locking barrel plugs, 12 VDC 0.5 A, 100-240 VAC (Switch-Mode)

Model Name	PWR-12050-WPUSJP-S1	PWR-12050-WPEU-S1	PWR-12050-WPUK-S1	PWR-12050-WPAU-S1	PWR-12050-WPCN-S1
Input Rating					
I/P	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz
Input Plug					
Plug Type	US/JP	EU	UK	AU	CN
Output Rating					
O/P	0.5 A @ 12 VDC	0.5 A @ 12 VDC	0.5 A @ 12 VDC	0.5 A @ 12 VDC	0.5 A @ 12 VDC
Output Plug					
Connector Type	S-Type 5.5/2.1/7.5	S-Type 5.5/2.1/7.5	S-Type 5.5/2.1/7.5	S-Type 5.5/2.1/7.5	S-Type 5.5/2.1/7.5
Outer Diameter	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)
Inner Diameter	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)
Physical Characteristics					
Dimensions (L x W x H)	64 x 40.5 x 47.5 mm (2.52 x 1.59 x 1.87 in)	64 x 40.5 x 68.7 mm (2.52 x 1.59 x 2.71 in)	64 x 40.5 x 56.2 mm (2.52 x 1.59 x 2.21 in)	64 x 40.5 x 58.5 mm (2.52 x 1.59 x 2.30 in)	64 x 40.5 x 46.5 mm (2.52 x 1.59 x 1.83 in)
Packaged Dimensions (L x W x H)	83 x 50 x 70 mm (3.27 x 1.97 x 2.76 in)	83 x 50 x 70 mm (3.27 x 1.97 x 2.76 in)	83 x 50 x 70 mm (3.27 x 1.97 x 2.76 in)	83 x 50 x 70 mm (3.27 x 1.97 x 2.76 in)	83 x 50 x 70 mm (3.27 x 1.97 x 2.76 in)
Weight	70 g (0.15 lb)	70 g (0.15 lb)	70 g (0.15 lb)	70 g (0.15 lb)	70 g (0.15 lb)
Cord Length	1530±100 mm (60.24±3.94 in)	1530±100 mm (60.24±3.94 in)	1530±100 mm (60.24±3.94 in)	1530±100 mm (60.24±3.94 in)	1530±100 mm (60.24±3.94 in)
Environmental Limits					
Operating Temperature	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)
Storage Temperature	-10 to 70°C (14 to 158°F)	-10 to 70°C (14 to 158°F)	-10 to 70°C (14 to 158°F)	-10 to 70°C (14 to 158°F)	-10 to 70°C (14 to 158°F)
Regulatory Approvals					
Safety	CE/FCC/UL/GS/PSE/RCM/CCC	CE/FCC/UL/GS/PSE/RCM/CCC	CE/FCC/UL/GS/PSE/RCM/CCC	CE/FCC/UL/GS/PSE/RCM/CCC	CE/FCC/UL/GS/PSE/RCM/CCC
Related Products					
Related Products	NPort 5110A, NPort 5130A, NPort 5150A, NPort 5210A, NPort 5230A, NPort 5250A, NPort Z2150/Z3150, NPort W2150A/W2250A, NPort P5110A				

DC Power Cord

Locking barrel plug to bare wires

CBL-PJ21NOPEN-BK-30

Cable Length: 300±20 mm (11.81±0.79 in)

AC Power Supplies

Locking barrel plugs, 12 VDC, 3 A 100-240 VAC (Switch-Mode)

Model Name	PWR-12300-WPUSJP-S1	PWR-12300-WPEU-S1	PWR-12300-WPUK-S1	PWR-12300-WPAU-S1	PWR-12300-WPCN-S1
Input Rating					
I/P	100-240 VAC 50-60 Hz	100-240 VAC 50-60 Hz	100-240 VAC 50-60 Hz	100-240 VAC 50-60 Hz	100-240 VAC 50-60 Hz
Input Plug					
Plug Type	US/JP	EU	UK	AU	CN
Output Rating					
O/P	3 A @ 12 VDC	3 A @ 12 VDC	3 A @ 12 VDC	3 A @ 12 VDC	3 A @ 12 VDC
Output Plug					
Connector Type	S-Type 5.5/2.1/7.5	S-Type 5.5/2.1/7.5	S-Type 5.5/2.1/7.5	S-Type 5.5/2.1/7.5	S-Type 5.5/2.1/7.5
Outer Diameter	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)
Inner Diameter	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)
Physical Characteristics					
Dimensions (L x W x H)	74 x 43.5 x 52.3 mm (2.91 x 1.71 x 2.06 in)	74 x 43.5 x 73.5 mm (2.91 x 1.71 x 2.89 in)	74 x 43.5 x 61 mm (2.91 x 1.71 x 2.40 in)	74 x 43.5 x 63.3 mm (2.91 x 1.71 x 2.49 in)	74 x 43.5 x 51.3 mm (2.91 x 1.71 x 2.02 in)
Packaged Dimensions (L x W x H)	100 x 60 x 90 mm (3.94 x 2.36 x 3.54 in)	100 x 60 x 90 mm (3.94 x 2.36 x 3.54 in)	100 x 60 x 90 mm (3.94 x 2.36 x 3.54 in)	100 x 60 x 90 mm (3.94 x 2.36 x 3.54 in)	100 x 60 x 90 mm (3.94 x 2.36 x 3.54 in)
Weight	163 g (0.36 lb)	163 g (0.36 lb)	163 g (0.36 lb)	163 g (0.36 lb)	163 g (0.36 lb)
Cord Length	1530±200 mm (60.24±7.87 in)	1530±200 mm (60.24±7.87 in)	1530±200 mm (60.24±7.87 in)	1530±200 mm (60.24±7.87 in)	1530±200 mm (60.24±7.87 in)
Environmental Limits					
Operating Temperature	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)
Storage Temperature	-20 to 70°C (-4 to 158°F)	-20 to 70°C (-4 to 158°F)	-20 to 70°C (-4 to 158°F)	-20 to 70°C (-4 to 158°F)	-20 to 70°C (-4 to 158°F)
Regulatory Approvals					
Safety	FCC/CE/UL/GS/CCC/RCM/PSE	FCC/CE/UL/GS/CCC/RCM/PSE	FCC/CE/UL/GS/CCC/RCM/PSE	FCC/CE/UL/GS/CCC/RCM/PSE	FCC/CE/UL/GS/CCC/RCM/PSE
Related Products					
Related Products	UPort 204, UPort 207, UPort 404, UPort 407				

DC Power Cord

Locking barrel plug to bare wires

CBL-PJ21NOPEN-BK-30

Cable Length: 300±20 mm (11.81±0.79 in)

AC Power Supplies

Non-locking barrel plugs, 12 VDC 0.5 A, 100-240 VAC (Switch-Mode)

Model Name	PWR-12050-WPUSJP-S2	PWR-12050-WPEU-S2	PWR-12050-WPUK-S2	PWR-12050-WPAU-S2	PWR-12050-WPCN-S2
Input Rating					
I/P	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz
Input Plug					
Plug Type	US/JP	EU	UK	AU	CN
Output Rating					
O/P	0.5 A @ 12 VDC	0.5 A @ 12 VDC	0.5 A @ 12 VDC	0.5 A @ 12 VDC	0.5 A @ 12 VDC
Output Plug					
Connector Type	L-Type 5.5/2.1/9.0	L-Type 5.5/2.1/9.0	L-Type 5.5/2.1/9.0	L-Type 5.5/2.1/9.0	L-Type 5.5/2.1/9.0
Outer Diameter	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)
Inner Diameter	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)
Physical Chracteristics					
Dimensions (L x W x H)	64 x 40.5 x 30 mm (2.52 x 1.59 x 1.18 in)	64 x 40.5 x 68.7 mm (2.52 x 1.59 x 2.71 in)	64 x 40.5 x 56.2 mm (2.52 x 1.59 x 2.21 in)	64 x 40.5 x 58.5 mm (2.52 x 1.59 x 2.30 in)	64 x 40.5 x 46.5 mm (2.52 x 1.59 x 1.83 in)
Packaged Dimensions (L x W x H)	83 x 50 x 70 mm (3.27 x 1.97 x 2.76 in)	83 x 50 x 70 mm (3.27 x 1.97 x 2.76 in)	83 x 50 x 70 mm (3.27 x 1.97 x 2.76 in)	83 x 50 x 70 mm (3.27 x 1.97 x 2.76 in)	83 x 50 x 70 mm (3.27 x 1.97 x 2.76 in)
Weight	70 g (0.15 lb)	70 g (0.15 lb)	70 g (0.15 lb)	70 g (0.15 lb)	70 g (0.15 lb)
Cord Length	1830±100 mm (72.05±3.94 in)	1830±100 mm (72.05±3.94 in)	1830±100 mm (72.05±3.94 in)	1830±100 mm (72.05±3.94 in)	1830±100 mm (72.05±3.94 in)
Environmental Limits					
Operating Temperature	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)
Storage Temperature	-10 to 70°C (14 to 158°F)	-10 to 70°C (14 to 158°F)	-10 to 70°C (14 to 158°F)	-10 to 70°C (14 to 158°F)	-10 to 70°C (14 to 158°F)
Regulatory Approvals					
Safety	CE/FCC/UL/RMC/PSE/CCC	CE/FCC/UL/RMC/PSE/CCC	CE/FCC/UL/RMC/PSE/CCC	CE/FCC/UL/RMC/PSE/CCC	CE/FCC/UL/RMC/PSE/CCC
Regulatory Products					
Related Products	NPort 5110, NPort 5130, NPort 5150, NPort 5210, NPort 5230, NPort 5232, NPort 5232I, MGate MB3180, MGate MB3280, DE-211, DE-311, A52, A53, MiiNePort E1-ST				

DC Power Cord

Non-locking barrel plug to bare wires

CBL-PJTB-10

Cable Length: 100±20 mm (3.94±0.79 in)

AC Power Supplies

Non-locking barrel plugs, 12 VDC 1.25/1.5 A, 100-240 VAC

Model Name	PWR-12125-USJP-S1	PWR-12150-EU-S2	PWR-12150-UK-S2	PWR-12150-AU-S2	PWR-12150-CN-S1
Input Rating					
I/P	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz
Input Plug					
Plug Type	US/JP	EU	UK	AU	CN
Output Rating					
O/P	1.25 A @ 12 VDC	1.5 A @ 12 VDC	1.5 A @ 12 VDC	1.5 A @ 12 VDC	1.5 A @ 12 VDC
Output Plug					
Connector Type	L-Type 5.5/2.1/9.5	L-Type 5.5/2.1/9.0	S-Type 5.5/2.1/9.0	L-Type 5.5/2.1/9.0	L-Type 5.5/2.1/9.0
Outer Diameter	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)
Inner Diameter	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)
Physical Characteristics					
Dimensions (L x W x H)	74 x 43.5 x 52.5 mm (2.91 x 1.71 x 2.07 in)	70 x 45 x 66.5 mm (2.76 x 1.77 x 2.62 in)	70 x 48 x 60 mm (2.76 x 1.89 x 2.36 in)	70 x 55 x 56 mm (2.76 x 2.17 x 2.21 in)	70 x 45 x 54 mm (2.76 x 1.77 x 2.13 in)
Packaged Dimensions (L x W x H)	100 x 60 x 90 mm (3.94 x 2.36 x 3.54 in)	100 x 60 x 90 mm (3.94 x 2.36 x 3.54 in)	100 x 60 x 90 mm (3.94 x 2.36 x 3.54 in)	100 x 60 x 90 mm (3.94 x 2.36 x 3.54 in)	100 x 60 x 90 mm (3.94 x 2.36 x 3.54 in)
Weight	108 g (0.24 lb)	200 g (0.44 lb)	200 g (0.44 lb)	200 g (0.44 lb)	200 g (0.44 lb)
Cord Length	1530±100 mm (60.24±3.84 in)	1800±200 mm (70.87±7.87 in)	1800±200 mm (70.87±7.87 in)	1800±200 mm (70.87±7.87 in)	1800±200 mm (70.87±7.87 in)
Environmental Limits					
Operating Temperature	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)
Storage Temperature	-20 to 70°C (-4 to 158°F)	-20 to 70°C (-4 to 158°F)	-20 to 70°C (-4 to 158°F)	-20 to 70°C (-4 to 158°F)	-20 to 70°C (-4 to 158°F)
Regulatory Approvals					
Safety	CE/FCC/UL/RMC/PSE/GS	CE/GS	CE	RMC	CCC
Related Products					
Related Products	NPort 5410, NPort 5430, NPort 5430I, NPort 5450, NPort 5450I, MGate MB3480				

DC Power Cord

Non-locking barrel plug to bare wires

CBL-PJTB-10

Cable Length: 100±20 mm (3.94±0.79 in)

AC Power Supplies

Desktop type power adapters

Model Name	PWR-12200-DT-S1	PWR-12125-DT-S2
Input Rating		
I/P	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz
Input Plug		
Plug Type	Desktop	Desktop
Output Rating		
O/P	2 A @ 12 VDC	1.25 A @ 12 VDC
Output Plug		
Connector Type	S-Type 5.5/2.1/7.5	S-Type 5.5/2.1/7.5
Outer Diameter	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)
Inner Diameter	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)
Physical Characteristics		
Dimensions (L x W x H)	110.8 x 51.8 x 32 mm (4.36 x 2.04 x 1.26 in)	75 x 47.5 x 27.3 mm (2.95 x 1.87 x 1.07 in)
Packaged Dimensions (L x W x H)	135 x 75 x 35 mm (5.31 x 2.95 x 1.38 in)	100 x 70 x 51.5 mm (3.94 x 2.76 x 2.03 in)
Weight	200 g (0.44 lb)	200 g (0.44 lb)
Cord Length	1800±200 mm (70.87±7.87 in)	1530±100 mm (60.24±3.84 in)
Environmental Limits		
Operating Temperature	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)
Storage Temperature	-20 to 70°C (-4 to 158°F)	-10 to 70°C (14 to 158°F)
Regulatory Approvals		
Safety	Efficiency Level 5: CE/FCC/UL/PSE/RCM/CCC Efficiency Level 6: CE/FCC/UL/PSE	CE/FCC/UL/PSE/GS
Related Products		
Related Products	NPort 5610-8-DT, NPort 5610-8-DT-J, NPort 5650-8-DT, NPort 5650-8-DT-J, NPort 5650I-8-DT, NPort 5610-8-DTL, NPort 5650-8-DTL, NPort 5650I-DTL	NPort 6150, NPort 6250-M-SC, NPort 6250, NPort 6250-S-SC, NPort 6450, UPort 1250I, UPort 1450, UPort 1450I, UPort 1610-8, UPort 1650-8

Note: PWR-12200-DT-S1and PWR-12125-DT-S2 not included with power cord

Model Name	PWC-C13US-3B-183	PWC-C-13EU-3B-183 (CEE 7/7 to IEC C13)	PWC-C13UK-3B-183	PWC-C13JP-3B-183	PWC-C13AU-3B-183	PWC-C13CN-3B-183
Region	US	EU	UK	JP	AU	CN
Voltage	125 V	250 V	250 V	125 V	250 V	250 V
Thickness	6.3±0.2 mm (0.25±0.01 in)	6.7±0.2 mm (0.26±0.01 in)	6.7±0.2 mm (0.26±0.01 in)	7.0±0.2 mm (0.28±0.01 in)	6.7±0.2 mm (0.26±0.01 in)	6.7±0.2 mm (0.26±0.01 in)
Max. Current	10 A	10 A	10 A	7 A	10 A	10 A
Length	1830±30 mm (72.05±1.18 in)	1830±30 mm (72.05±1.18 in)	1830±30 mm (72.05±1.18 in)	1830±30 mm (72.05±1.18 in)	1830±30 mm (72.05±1.18 in)	1830±30 mm (72.05±1.18 in)
Related Products	CN2500 Series, NPort 6600 Series, NPort 5600 Series, PWR-12200-DT-S1					

Model Name	PWC-C7US-2B-183	PWC-C7EU-2B-183	PWC-C7UK-2B-183	PWC-C7JP-2B-183	PWC-C7AU-2B-183	PWC-C7CN-2B-183
Region	US	EU	UK	JP	AU	CN
Length	1830±200 mm (72.05±7.87 in)	1830±200 mm (72.05±7.87 in)	1830±200 mm (72.05±7.87 in)	1830±200 mm (72.05±7.87 in)	1830±200 mm (72.05±7.87 in)	1830±200 mm (72.05±7.87 in)
Related Products	PWR-12125-DT-S2	PWR-12125-DT-S2	PWR-12125-DT-S2	PWR-12125-DT-S2	PWR-12125-DT-S2	PWR-12125-DT-S2

Locking barrel plug to bare wires

CBL-PJ21NOPEN-BK-30

Cable Length: 300±20 mm (11.81±0.79 in)

Wide Temperature AC Power Supplies

Locking barrel plug, 12VDC 1.5A, 100-240VAC (Switch-Mode)

Model Name	PWR-12150-USJP-SA-T	PWR-12150-EU-SA-T	PWR-12150-UK-SA-T	PWR-12150-AU-SA-T	PWR-12150-CN-SA-T
Accessories Image					
Input Rating					
I/P	100 to 240 VAC, 50 to 60 Hz	100 to 240 VAC, 50 to 60 Hz	100 to 240 VAC, 50 to 60 Hz	100 to 240 VAC, 50 to 60 Hz	100 to 240 VAC, 50 to 60 Hz
Input Plug					
Plug Type	US/JP	EU	UK	AU	CN
Output Rating					
O/P	1.5A @ 12VDC	1.5A @ 12VDC	1.5A @ 12VDC	1.5A @ 12VDC	1.5A @ 12VDC
Protection Requirements					
Protection	Over current protection/ Over voltage protecction				
Output Plug					
Connector Type	L-Type 5.5/2.1/7.5	L-Type 5.5/2.1/7.5	L-Type 5.5/2.1/7.5	L-Type 5.5/2.1/7.5	L-Type 5.5/2.1/7.5
Outer Diameter	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)
Inner Diameter	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)
Physical Characteristics					
Dimensions (L x W x H)	32 x 70.3 x 88 mm (1.26 x 2.77 x 3.46 in)	32 x 85.3 x 88 mm (1.26 x 3.36 x 3.46 in)	50 x 91 x 82.5 mm (1.97 x 3.58 x 2.25 in)	41 x 73.9 x 89.5 mm (1.61 x 2.91 x 3.52 in)	32 x 60 x 88 mm (1.26 x 2.36 x 3.46 in)
Weight	200 g (0.44 lb)	200 g (0.44 lb)	200 g (0.44 lb)	200 g (0.44 lb)	200 g (0.44 lb)
Cord Length	1500±200 mm (59.06±7.87 in)	1500±200 mm (59.06±7.87 in)	1500±200 mm (59.06±7.87 in)	1500±200 mm (59.06±7.87 in)	1500±200 mm (59.06±7.87 in)
Environmental Limits					
Operating Temperature	-40 to 75°C (-40 to 167°F)	-40 to 75°C (-40 to 167°F)	-40 to 75°C (-40 to 167°F)	-40 to 75°C (-40 to 167°F)	-40 to 75°C (-40 to 167°F)
Regulatory Approvals					
Safty	FCC/UL/PSE	TUV/CE/GS	CE	RCM	CCC
Related Products					
Related Products	NPort 5110-T, NPort 5450-T,NPort 5450I-T, NPort 5110A-T, NPort 5610-8-DTL-T, NPort 5650-8-DTL-T, NPort 5650I-8-DTL-T, NPort 5130A-T, NPort 5150A-T, NPort 5210A-T, NPort 5230A-T, NPort 5250A-T, NPort 6100-T, NPort 6200-T, NPort 6400-T				

Power Supplies

24/48 VDC power supplies for installation on a DIN rail

	24 VDC DIN-Rail Power Supplies					48 VDC DIN-Rail Power Supplies			
Model Name	DR-4524	DR-75-24	DR-120-24	MDR-40-24	MDR-60-24	DR-75-48	DR-120-48	DRP-240-48	SDR-480P-48
Accessories Image									
Physical Characteristics and Temperature Limits									
Dimensions	78 x 67 x 93 mm (3.07 x 2.64 x 3.66 in)	55.5 x 100 x 125.2 mm (2.19 x 3.94 x 4.93 in)	65.5 x 100 x 125.2 mm (2.58 x 3.94 x 4.93 in)	40 x 90 x 100 mm (1.57 x 3.54 x 3.94 in)	40 x 90 x 100 mm (1.57 x 3.54 x 3.94 in)	55.5 x 100 x 125.2 mm (2.19 x 3.94 x 4.93 in)	65.5 x 100 x 125.2 mm (2.58 x 3.94 x 4.93 in)	125.5 x 125.5 x 100 mm (4.94 x 4.94 x 3.94 in)	85.5 x 125.2 x 128.5 mm (3.37 x 4.93 x 5.06 in)
Weight	400 g (0.88 lb)	550 g (1.21 lb)	650 g (1.43 lb)	260 g (0.57 lb)	280 g (0.62 lb)	550 g (1.21 lb)	650 g (1.43 lb)	1.2 kg (2.65 lb)	1.6 kg (3.53 lb)
Operating Temperature	-10 to 50°C (14 to 122°F)	-10 to 60°C (14 to 140°F)		-20 to 70°C (-4 to 158°F)		-10 to 60°C (14 to 140°F)		-10 to 70°C (14 to 158°F)	-25 to 70°C (-13 to 158°F)
Relative Humidity	20 to 90% RH	20 to 90% RH		20 to 90% RH		20 to 90% RH			10 to 95% RH
Power Requirements									
Wattage	45 W	75 W	120 W	40 W	60 W	75 W	120 W	240 W	480 W (current sharing up to 3840 W)
Input Voltage	85-264 VAC (47-63 Hz), or 120-370 VDC		88-132 VAC, or 176-264 VAC (47-63 Hz) by switch, or 248-370 VDC	85-264 VAC (47-63 Hz) or 120-370 VDC		85-264 VAC (27-63 Hz) or 120-370 VDC	88-132 VAC, or 176-264 VAC (47-63 Hz) by switch, or 248-370 VDC	85-264 VAC (47-63 Hz) or 120-370 VDC	90 to 264 VAC or 127 to 370 VDC
Output Power	48 W (24 VDC @ 0-2 A)	76.8 W (24 VDC @ 0-3.2 A)	120 W (24 VDC @ 0-5 A)	40 W (24 VDC @ 0-1.7 A)	60 W (24 VDC @ 0-2.5 A)	76.8 W (48 VDC @ 0-1.6 A)	120 W (48 VDC @ 0-2.5 A)	240 W (48 VDC @ 0-5 A)	480 W (48 VDC @ 0-10 A)
Over-voltage Protection	27.6 to 32.4 V	29 to 33 V		31.2 to 36 V		58 to 65 V		54 to 60 V	56-65 V
Overload Protection	105-150%								110-150%
Type	Constant Current Limiting								
Reset	Auto Recovery								
Inrush Current	30 A and 115 V, or 60 A and 230 V								40 A/115 VAC or 80 A/230 VAC
Reliability									
Safety Standards	EN 60950-1, UL 508 approved								
EMC Standards	EN 55022 Class B, EN 61000-4-2/3/4/5/6/8/11, ENV 50204, EN 61000-3-2, EN 50082-2								
Warranty	3 years (see www.moxa.com/warranty)								

Fiber Accessories

Fiber Optic Adapters

SC male to ST female duplex adapters

These SC male to ST female duplex adapters are provided as an optional accessory to give users of Moxa industrial Ethernet switches more fiber optic connection options. Simply plug the adapters directly into the SC connector of any Moxa industrial Ethernet switch to convert the original SC connector into an ST connector. This allows you to use an ST connector with any MOXA industrial Ethernet switch, but without the need for an extra patchcord.

ADP-SCm-STf-S

SC male to ST female duplex adapter for single-mode fiber

Single-mode: 9/125 µm
Ferrules and Sleeves: Zirconia Ceramic
Body Color: Blue
Insertion Loss: 0.5/1.1 (TYP/MAX)
SC-side Connector: SC male
ST-side Connector: ST female

ADP-SCm-STf-M

SC male to ST female duplex adapter for multi-mode fiber

Multi-mode: 62.5/125 µm
Ferrules and Sleeves: Zirconia Ceramic
Body Color: Gray
Insertion Loss: 0.1/0.3 (TYP/MAX)
SC-side Connector: SC male
ST-side Connector: ST female

Caps

Model Name	A-CAP-M12M-M	A-CAP-M12F-M	A-CAP-N-M	A-CAP-M30M-MIP67	A-CAP-WPRJ45-MC
Accessories Image					
Description	Metal cap to cover M12-male connector	Metal cap to cover M12-female connector	Metal cap to cover N-type connector	Metal cap to cover M30 connector	Metal cap with chain for RJ45 connector
Related Products	Power cap for the AWK-4121 AWK-4131-M12 AWK-6222 AWK-6232-M12 DI/O cap for the AWK-4131-M12 AWK-6232-M12 PM-7200-4M12 TN Series	DI/O cap for the AWK-4121 AWK-6222 LAN cap for the AWK-3121-M12-RTG AWK-3131-M12-RCC AWK-5232-M12-RCC AWK-4131-M12 AWK-6232-M12 TN Series	Antenna cap for the AWK-4121 AWK-4131-M12 AWK-6222 AWK-6232-M12	SFP cap for the AWK-4131-M12	Console & LAN caps for the AWK-4121 AWK-6222 Console cap for the AWK-4131-M12 AWK-6232-M12

Connectors

Model Name	CBL-M12(FF5P)/ OPEN-100 IP67	CBL-M12D(MM4P)/ RJ45-100 IP67	CBL-M23(FF6P)/ OPEN-BK-100 IP67	M12A-5P-IP68	M12A-8PMM-IP68	CBL-M12DFF4PRJ45-BK-10-IP67	CBL-M12MM8PRJ45-BK-100-IP67	M12A-8PFF-IP67
Accessories Image								
Description	1-meter M12-to-5-pin power cable with IP67-rated 5-pin female A-coded M12 connector	1-meter M12-to-RJ45 Cat-5C UTP Ethernet cable with IP67-rated 4-pin male D-coded M12 connector	1-meter M23-to-6-pin power cable with IP-67-rated female 6-pin M23 connector	Field-installation A-coded M12 screw-in 5-pin connector, female connector female pins	Field-installation A-coded M12 screw-in 8-pin connector, male connector male PIN	M12-to-RJ45 Cat-5E UTP Ethernet cable with IP67-rated female 4-pin D-coded M12 connector	M12-to-RJ45 Cat-5E UTP Ethernet cable with IP67-rated male 8-pin A-coded M12 connector	Field-installation A-coded M12 screw-in 8-pin connector, female connector female PIN
Cable Length	1 m (39.37 in)	–	–	–	–	10 m (393.70 in)	1 m (39.37 in)	–
Related Products	AWK-4121 AWK-4131-M12 AWK-6222 AWK-6232-M12	TN Series ioPAC 8000 Series	TN Series TAP-6226-TC	Power connector for the AWK-4121 AWK-4131-M12 AWK-6222 AWK-6232-M12	DI/O connector for the AWK-4121 AWK-6222 LAN connector for the AWK-4131-M12 AWK-6232-M12	AWK-4121 AWK-6222	AWK-4131-M12 AWK-6232-M12	DI/DO connector for the AWK-4131-M12 AWK-6232-M12

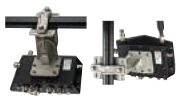
	Field-Installation Connectors	
Model Name	A-PLG-WPM30IP67-01	A-PLG-WPRJ
Accessories Image		
Description	Field-Installation for M30 plug	Field-installation RJ-type plug
Related Products	SFP LAN connector for the AWK-4131-M12	LAN connector for the AWK-4121 AWK-6222

Mounting Kits

	Wall-Mounting Kits							
Model Name	WK-30	WK-32	WK-35-01	WK-35-02	WK-36-02	WK-44-01	WK-45-01	WK-46
Accessories Image								
Dimensions	40 x 30 x 1 mm (1.57 x 1.18 x 0.04 in)	30.3 x 140 x 12.3 mm (1.19 x 5.51 x 0.48 in)	35 x 44 x 2.5 mm (1.38 x 1.73 x 0.10 in)	35 x 24 x 1.2 mm (1.38 x 0.94 x 0.05 in)	36 x 67 x 2 mm (1.42 x 2.64 x 0.08 in)	44 x 57.5 x 1.6 mm (1.73 x 2.26 x 0.06 in)	45 x 57 x 2.5 mm (1.77 x 2.24 x 0.10 in)	51.6 x 66.8 x 1 mm (2.03 x 2.63 x 0.04 in)
Related Products	EDS-205A Series EDS-G205 Series EDS-G205A-4PoE Series ICF-1170I Series	EDS-828 Series EDS-728 Series	NPort 6450, UPort 1410, UPort 1450, UPort 1450I	NPort 6150/6250 Series UPort 404 UPort 407	NPort IA5150A Series NPort IA5250A Series MGate 4101-MB-PBS MGate 4101I-MB-PBS	NPort 6600-8 Series NPort 6600-16 Series NPort 6600-32 Series UPort 1600-16 Series	NPort 5600-8 Series NPort 5600-16 Series NPort 5650-8-HV-T NPort 5650-16-HV-T CN2600-8 Series CN2600-16 Series CN2600-8-2AC Series CN2600-16-2AC Series	EDS-208A Series EDS-300 Series EDS-400A Series EDS-500A Series EDS-G308 Series EDS-G509 Series EDS-P206A-4PoE Series EDS-P308 Series EDS-P510 Series OBU-102 Series IMC-101G/101 Series PT-500 Series VPort 354 Series VPort 364A Series VPort 461A Series NPort S8455I-MM-SC NPort S8455I-MM-SC-T NPort S8455I-SS-SC NPort S8455I-SS-SC-T NPort S8458-4S-SC-T

	Wall-Mounting Kits				
Model Name	WK-51-01	WK-55	WK-75	WK-90	WK-195
Accessories Image					
Dimensions	55 x 67 x 1 mm (2.17 x 2.64 x 0.04 in)	55 x 34.5 x 2.5 mm (2.17 x 1.36 x 0.10 in)	75 x 90 x 2.5 mm (2.95 x 3.54 x 0.10 in)	99 x 62 x 2.5 mm (3.90 x 2.44 x 0.10 in)	195 x 17.5 x 52.5 mm (7.68 x 0.69 x 2.07 in)
Related Products	AWK-1000 Series AWK-3000 Series AWK-5222 Series AWK-1000A Series AWK-3000A Series OnCell 5104-HSPA OnCell G3470A-LTE WDR-3124A WAC-1001 EDR-G902 Series EDR-G903 Series EDS-P506A-4PoE Series EDS-316 Series IMC-101/IMC-P101 Series PTC-101 Series NPort IA5450A Series ioPAC 5500 Series	AWK-4121 AWK-4131-M12 AWK-6222 AWK-6232-M12	EDS-600 Series ioPAC 8000 Series	ioLogik E1500 Series	PT-7710 Series

Mounting Kits

	DIN-Rail Mounting Kits					Pole-Mounting Kit
Model Name	DK-DC50131	DK-TN-5308	DK-M12-305	DK-25-01	DK-35A	PK-DC2DOF
Accessories Image						
Dimensions	50 x 131 x 1 mm (1.97 x 5.16 x 0.05 in)	66 x 174 x 12.8 mm (2.60 x 6.85 x 0.50 in)	60 x 125 x 12.8 mm (2.36 x 4.92 x 0.50 in)	25 x 48.3 mm (0.98 x 1.90 in)	42.5 x 10 x 19.34 mm (1.67 x 0.39 x 0.76 in)	–
Related Products	TN-5500 Series AWK-4121 AWK-4131-M12 AWK-6222 AWK-6232-M12 ioPAC 5500 Series ioPAC 8000 Series ioLogik E1500 Series MxNVR-MO4 Series	TN-5308 Series	TN-5305 Series	UPort 404 UPort 407	MGate™ 3x80 Series NPort Express DE-211 NPort Express DE-311 NPort 5100 Series NPort 5100A Series NPort 5200 Series NPort 5200A Series NPort 5400 Series NPort 6150/6250/6450 NPort W2x50A UPort 1150I UPort 404/407 UPort 1250/1250I TCF-142 Series TCC-100/100I TCC-120/120I	AWK-4121 AWK-4131-M12 AWK-6222 AWK-6232-M12

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> **The latest product information can be found here: www.moxa.com/product**

Simplicity

Robustness

User-Centric Experience

Moxa Green Core

Delivering a Unified Brand Presence

Moxa's brand new "Green Core" product identity incorporates a special shade of green to deliver a unified brand presence. The Green Core product identity emphasizes the three design concepts of simplicity, robustness, and user-centric experience, and was carefully planned to complement our brand promise of "Reliable Networks, Sincere Service."

New Moxa products already adhere to the Green Core product identity, and existing products will be converted to the Green Core design starting in May 2014. All Moxa products will be Green Core by the end of 2016. For more information about Moxa Green Core, please visit **www.moxa.com/greencore** to understand our brand promise, essence, and story.

Your Trusted Partner in Automation

Moxa is a leading provider of edge connectivity, industrial computing, and network infrastructure solutions for enabling connectivity for the Industrial Internet of Things. With over 25 years of industry experience, Moxa has connected more than 40 million devices worldwide and has a distribution and service network that reaches customers in more than 70 countries. Moxa delivers lasting business value by empowering industry with reliable networks and sincere service for industrial communications infrastructures.

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