DELTA

http://www.delta.com.tw/products/plc.asp

Operation Interface Panels Series
TP04G-AS2
Instruction Sheet

Serial Number Explanation

TP04GAS 2 T 4 30 0002
→ Production serial number
→ Production weeks
→ Production year (2004)
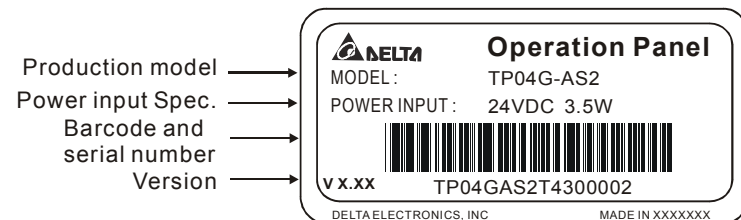T: Taoyuan → Production factory
→ Version
→ Production model

1 — WARNING

⚠ Always read this instruction before using the TP04G.

⚠ DANGER! DC input power must be disconnected before any maintenance. Do not connect or disconnect wires and connectors while power is applied to the circuit. Maintenance must be performed by qualified technicians.

⚠ The display panel of the TP04G is waterproof. But please avoid grease, corrosive liquids and sharp objects from coming into contact with the TP04G.

⚠ DANGER! The TP04G requires 24VDC input power. The 24VDC input power should not be connected to the RS-485 communication port. The unit may be destroyed beyond repair if the input power is incorrectly applied. Please confirm the input power wiring is correct before applying power.

⚠ DANGER! An electrical charge will remain on the DC-link capacitors for 1 minute after power has been removed. This residual power may be hazardous and the TP04G should not be worked on until this charge has dissipated. To avoid personal injury, do not conduct any wiring or investigation on the TP04G until 1 minute after power has been removed.

⚠ CAUTION! Always ground the TP04G using the grounding terminal. This will not only act as a safety, but also help filter electrical noise. The grounding method must comply with the laws of the country where the unit is to be installed.

⚠ CAUTION! If you turn the fixed support which packaged with TP04G too tight, TP04G may be damaged.

⚠ Battery replacement: please use UL component type: CR2030 lithium battery which battery life is 1200 hours after power loss. (NOTE: RTC should be reset after changing battery).
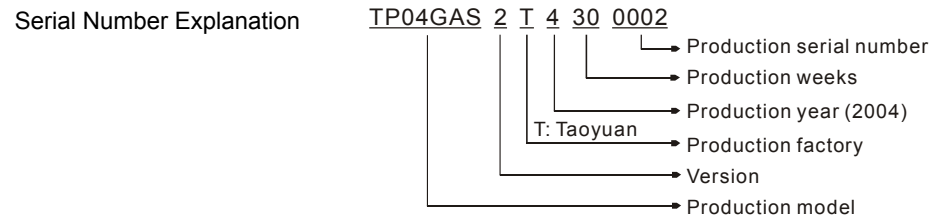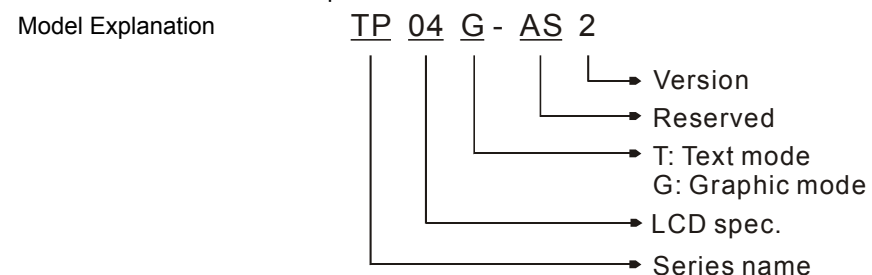
2 — INTRODUCTION

2.1 Model Explanation

- Thank you for choosing DELTA's OIP Series. The features of TP04G-AS2 are: resolution is 128*64, display 8*4 Chinese characters max. and Multilanguage support.
- Built-in two communication ports (RS-232 and RS-485/RS-422, can be used simultaneously)
- Built-in RTC and communication/alarm indication LED.
- Possess expansion slot for program copy card to copy settings and programs rapidly and save download time.
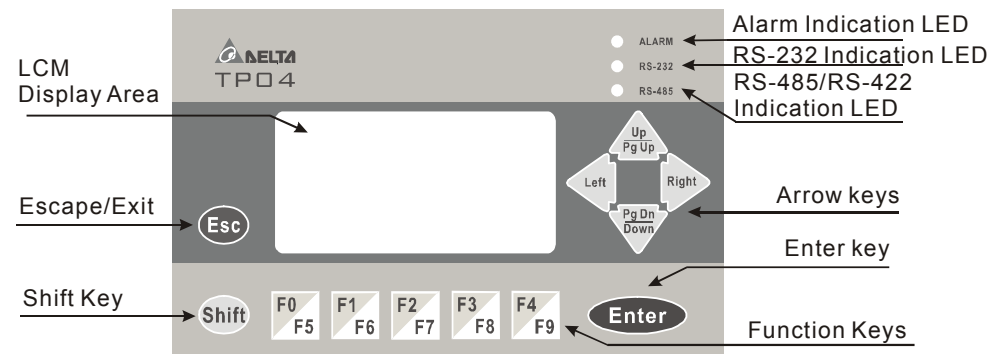- Built-in variety objects to meet your requirement.
- ◼ Nameplate

Operation Panel
MODEL : TP04G-AS2
POWER INPUT : 24VDC 3.5W

v x.xx   TP04GAS2T4300002

DELTA ELECTRONICS, INC   MADE IN XXXXXXX

Production model
Power input Spec.
Barcode and serial number
Version

Note: The words of "MADE IN XXXXX" will be different due to the manufacturing location.

◼ Model and Serial Number Explanation

Model Explanation   TP 04 G - AS 2

→ Version
→ Reserved
→ T: Text mode
   G: Graphic mode
→ LCD spec.
→ Series name

2.2 Outline

LCM Display Area
TP04
Escape/Exit (Esc)
Shift Key → Shift
F0/F5 F1/F6 F2/F7 F3/F8 F4/F9
Up/Pg Up, Left, Right, Pg Dn/Down
Enter

Alarm Indication LED
RS-232 Indication LED
RS-485/RS-422 Indication LED
Arrow keys
Enter key
Function Keys

2.3 Panel Function Explanation

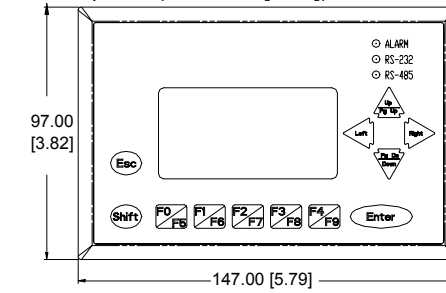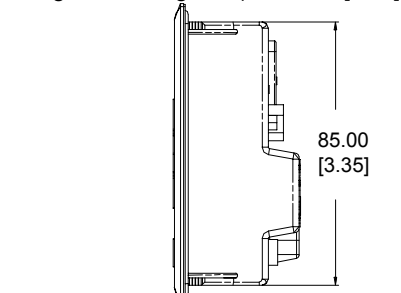| PANEL COMPONENT	EXPLANATION
Alarm Indication LED (RED)	Status 1: When power is on, the LED will flash slowly. Status 2: When there is an abnormal situation, the LED will flash quickly along with an alarm sound.
RS-232 Indication LED (Yellow)	It will be flashing when transmitting program and communicating by using RS-232.
RS-485/RS-422 Indication LED (Green)	It will be flashing when communicating by using RS-485/RS-422.
LCM display Area	Liquid Crystal Module display area used to display current program state.
Escape/Exit	Used to cancel an incorrect input, or to Exit a programming step.
Arrow Keys	**UP/Pg Up:** Used to increase the value or move up one page. **Pg Dn/DOWN:** Used to decrease the value or move down one page. **Left:** Left direction key. (move curser to left) **Right:** Right direction key. (move cursor to right)
Shift Key	Used to select keys F5, F6, F7, F8, F9.
Enter key	Used to input a value or accept a programming command.
Function Keys	**F0/F5:** They are used to be constant 0 (F0) and 5 (Shift+F0) when they are in system menu and user can define the functions separately when they are in user page. **F1/F6:** They are used to be constant 1 (F1) and 6 (Shift+F1) when they are in system menu and user can define the functions separately when they are in user page. **F2/F7:** They are used to be constant 2 (F2) and 7 (Shift+F2) when they are in system menu and user can define the functions separately when they are in user page. **F3/F8:** They are used to be constant 3 (F3) and 8 (Shift+F3) when they are in system menu and user can define the functions separately when they are in user page. **F4/F9:** They are used to be constant 4 (F4) and 9 (Shift+F4) when they are in system menu and user can define the functions separately when they are in user page.

2.4 Back Panel

RS-232/RS-422
Battery switch for RS-485/422
+24V 0V
RS-485
Expansion slot
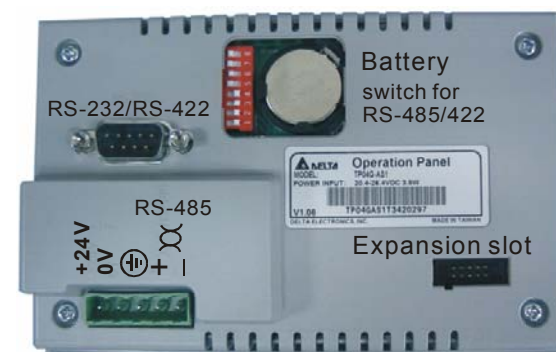
5-PIN terminals:
Wire gauge: 12-24 AWG
Torque: 4.5 lb.-inch.

2.5 Dimension

Front panel (unit: mm [inch])

97.00 [3.82]
147.00 [5.79]

Right side diagram (unit: mm [inch])

85.00 [3.35]

Back panel

RS-232   BATTERY
24V 0V RS-485
EXTENSION PORT
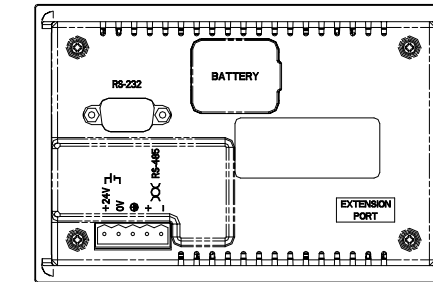
Mounting dimension (unit: mm [inch])

85 [3.35]
135~136.5[5.31~5.37]
Thickness Range 0.5~9mm
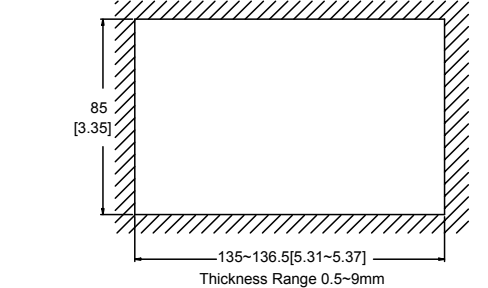
Vertical view (Unit: mm)


3.5
30.5
35.5
135
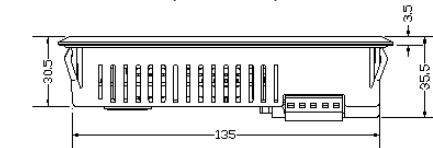
2.6 Installation

Mounting TP04G into the opening is done by carefully fitting the unit into the opening and pressing firmly on all four corners. (NOTE: the flat surface should be a Type 4 "Indoor Use Only" enclosure or equivalent.) You could fix it by using the fixed support packaged with TP04G. You should infix the fixed support in the back cover and turn the screw in to fix.

⚠ If fixed support is not installed well, the waterproof function will not be guaranteed. If you turn the screw exceeds torque: 4-5(kg-cm), TP04G may be damaged.

Please leave sufficient space (more than 50mm) around the unit for heat dissipation.

Thickness: 0.5~9.0mm

50mm   50mm
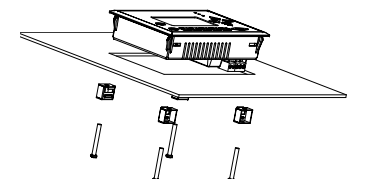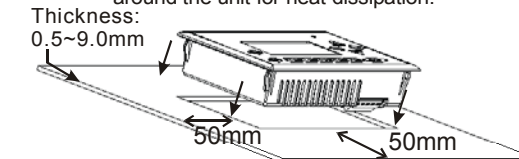
3 — SPECIFICATION

3.1 Electrical Specification

ITEM	TP04G-AS2
Function Key/Digital Key	F0~F4, ESC, SHIFT, ENTER and ARROW keys
External Input Power	24V (60mA Max.) (-15%-20%)
Memory Capacity	256K Byte
CPU	Hitachi HD64F3064F
RAM of System	32K Byte
Communication Interface	COM1: RS232; COM2: RS422/RS485
Waterproof Class of Front Panel	IP65/NEMA4/UL Type 4 (indoor use)
Operation Environment	0~50℃, relative humidity 20-90% RH (non-condensing)
Storage Temperature for Hardware	-20~60℃
Vibration	1.0G, 10-150Hz, X, Y, Z three directions and 10 sweep cycles per axis
Shock	15G, 11ms, from X, Y, Z three directions and three times for each direction
Radiated Emission	CISPR22, Class A
Electrostatic Discharge Immunity	EN61000-4-2/1995
Radiated Immunity	EN61000-4-31995
Electrical Fast Transient	EN61000-4-4/1995
Weight/Dimension	0.24kg/147×97×35.5mm (Width × Height × Deep)
Cooling Method	Natural Air Cooling
Pollution degree	2
Altitude	2000 m or lower

3.2 Function Specification

ITEM		TP04G-AS2
Display Screen	Screen	STN-LCD
	Color	Monochromatic
	Backlight	The back-light automatic turn off time is 1~99 minutes (0 = do not turn off) (back-light life is about 50 thousand hours at 25℃)
	Resolution	128X64 Points
	Display Range	67mm (W) X 32mm (H); 3.00" (diagonal preferred)
	Contrast Adjustment	10-step contrast adjustment
	Font	ASCII: characters (including European Fonts) Taiwan: (BIG 5 code) traditional Chinese character font China: (GB2324-80 code) simplified Chinese character font
	Maximum words x rows, for each font size	5X 8: 25 words X 8 rows 8X8: 16 words X 8 rows 8X12: 16 words X 5 rows 8X16: 16 words X 4 rows
	Font Size	ASCII: 5X8, 8X8, 8X12, 8X16
	Alarm Indication LED (RED)	1. Power on indication (Flash three times) 2. Flash for communication error or other alarm 3. Special Indication by user programming
	RS-232 Indication LED (Yellow)	It will be flashing when transmitting program and communicating by using RS-232.
	RS-485/RS-422 Indication LED (green)	It will be flashing when communicating by using RS-485/RS-422.
External Interface	Program Memory	256KB flash memory
	Serial Communication Port RS-232 (COM1)	Unsynchronized transmission method: RS-232 Data length: 7 or 8bits, Stop bits: 1or 2 bits Parity: None/Odd/Even, Transmission speed: 9600bps~115200bps RS-232: 9 PIN D-SUB male
	Expansion Communication Port RS-422/RS-485 (COM2)	Unsynchronized transmission method: RS-485/RS-422 Data length: 7 or 8 bits, Stop bits: 1 or 2 bits Parity: None/Odd/Even Transmission speed: 9600bps~115200bps RS-422: 9 PIN D-SUB male RS-485: 5-Pin removal terminal
	Expansion Slot	1. Update program version 2.The slot for program copy card
	Battery Cover	DC 3V battery for HMI
	5-Pin Removal Terminal	There are DC 24V input and RS-485 input

4 PROGRAM COPY CARD

The function of program copy card that TP04G provides to copy user program, system function and passwords is different from the copy program. It is used to copy the whole HMI environment settings and application programs to another HMI rapidly. It can save much time and manpower. The operation is in the following.

Definition: Program Copy Card →PCC, TP Series →TP

Step	TP→PCC	PCC→TP
1	Turn the switch on the PCC to TP→PCC	Turn the switch on the PCC to PCC→TP
2	Insert the PCC into the expansion slot of TP	Insert the PCC into the expansion slot of TP
3	Input the power to TP	Input the power to TP
4	It will display "remove PCC" on the screen and power on again	It will display "remove PCC" on the screen and power on again

HMI display message

Copy HMI program to PCC (TP→PCC)	Copy PCC program to HMI (PCC→TP)
If the model type of TP does not correspond with the model type of program of PCC, TP will display "TP series and PCC is different. Press Enter to Confirm TP series→PCC. Press Esc to Exit".	If there is no program in PCC, TP will display "The PCC is Empty. PCC→TP series is illegal".
TP will display "TP →PCC series Please wait!" during transmission.	TP will display "TP →PCC series Please wait!" during transmission.
TP will display "Please Remove the PCC and Reboot" when completing transmitting.	TP will display "Please Remove the PCC and Reboot" when completing transmitting.

5 PASSWORD FUNCTION

1. If the password is forgotten, the password may be cleared using the following code: 8888. This universal code will clear the password and all internal programs of TP04. The TP04 will be re-set to the factory settings.

2. Users may use 0~9 and A~Z as characters for the password. Users must use the function keys F0~F4 to input the password characters.

F0/F5: scrolls in a loop as follows 0 → 5 → A → B → C → D → E → F → 0

F1/F6: scrolls in a loop as follows 1 → 6 → G → H → I → J → K → 1

F2/F7: scrolls in a loop as follows 2 → 7 → L → M → N → O → P → 2

F3/F8: scrolls in a loop as follows 3 → 8 → Q → R → S → T → U → V → 3

F4/F9: scrolls in a loop as follows 4 → 9 → W → X → Y → Z → 4

6 HARDWARE OPERATION

After power is supplied to TP04G, the alarm indication LED will flash three times and startup display on the LCM display area will show "No User Data in Memory, Press ESC 5 seconds, Return to System".

The steps to Startup the TP04G:
1. Connect power line,
2. Apply 24V DC power,
3. Enter into the startup display,
4. Enter the user-designed program,
5. Press Esc key and hold on for 5 seconds to return to system menu.
There are five selections in the system menu and are described below.

| SELECTIONS	EXPLANATION
Download Program	Use the connection cable (DVPACAB530) to connect the serial communication port RS-232 of TP04 to a PC. Then use the TPEdit software to download an application program to the TP04.
Upload Program	Use the connection cable (DVPACAB530) to connect the serial communication port RS-232 of TP04 to a PC. Then use the TPEdit software to upload an application program from the TP04.
Copy Program	Transfer a program between two TP04 units. 1: transmit programs 2: receive programs When transmitting programs and data between two TP04 units. Set one TP04 to "Receive Program" mode and the other TP04 to "Transmit Program" mode. Please use twisted pair wires to connect the two units via the RS-485 ports.
TP04 Settings	There are 8 items that used to modify TP04 system settings: 1. Communication protocol: Setting the address of TP04, the control port of PLC, and the communication string for either RS-232 or RS-485. 2. Contrast: Adjust the contrast of LCM display screen. 3. Back-light: adjust the automatic turn off time of LCM. Setting range is 00~99 seconds. If set to 00, the LCM Back-light will not turn off. 4. Date and Time: It is used to set the TP04 built-in RTC including year, month, day, hour, minute, second and week. Also the internal battery capacity display is shown here. 5. Buzzer: Used to set the buzzer sound, normal mode or quiet mode. 6. Language Setting: Used to set the displayed language. English, Traditional Chinese, simplified Chinese or user defined language. 7. Password setting: Used to set, enable, and disable the password function. If the password function is enabled, it will require the user to input a password before entering any system menu. The factory password is 1234. 8. Startup display: Used to select the TP04 startup display. User can select "user defined" to use the file that designed by TPEdit and download to TP04.
PLC Connection	There are three methods to connect to PLC: 1. Using serial communication port (COM1) RS-232 of TP04: set 8-pin DIP switch to RS-485 mode and connect the cable (DVPACAB215 or DVPACAB230) to program communication I/O RS-232C of PLC. 2. Using expansion communication port (COM2): set 8-pin DIP switch to RS-485 mode and connect 5-pin removal terminal of expansion communication port to RS-485 of PLC with twisted pair. 3. Using expansion communication port (COM2): set 8-pin DIP switch to RS-422 mode and connect four pins (6, 7, 8, 9) of 9 PIN D-SUB male to RS-422 of PLC with 4-wire cable.
Execution	Execute the internal program that download from TPEdit or transmitted from other TP04 units. When entering execution program, you can return to system menu by pressing Escape/Exit (Esc) key for 5 seconds.

7 COMMUNICATION CONNECTION

■ **TP04G may connect to a PC by using connection cable DVPACAB530**
PC or TP02/04G

ON PC (RS-232)　　　ON TP04G

9 PIN D-SUB　　　9 PIN D-SUB
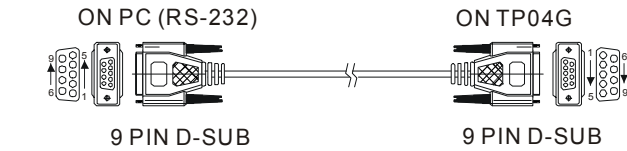
PC COM Port 9 PIN D-SUB female		TP02/04G COM Port 9 PIN D-SUB female	
Rx	2	3	Tx
Tx	3	2	Rx
GND	5	5	GND

■ **TP04G may connect to a DVP-PLC by using connection cable DVPACAB215/ DVPACAB230**
PC or TP02/04G

25 PIN D-SUB
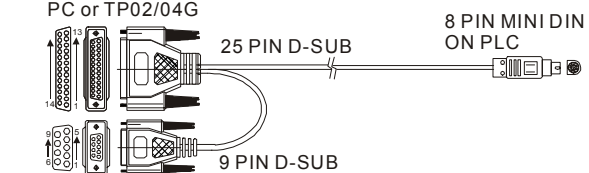
8 PIN MINI DIN ON PLC

9 PIN D-SUB

PC/HMI COM Port 25 PIN D-SUB female		PLC COM1 Port 8 PIN MINI DIN	
Tx	2	4	Rx
Rx	3	5	Tx
GND	7	8	GND
6 8 20	4	1,2	5V

PC/HMI COM Port 9 PIN D-SUB female		PLC COM1 Port 8 PIN MINI DIN	
Rx	2	4	Rx
Tx	3	5	Tx
GND	5	8	GND
1 4 6	7 8	1,2	5V

■ The Pin definition of 9 PIN D-SUB
1. RS-232

TP04G-AS2 COM Port RS-232 9 PIN D-SUB male	
3	Tx
2	Rx
5	GND

2. RS-422

TP04G-AS2 COM Port RS-422 9 PIN D-SUB male	
6	Rx +
7	Rx -
8	Tx +
9	Tx -

■ Switch between RS-422 / RS-485 (by using 8-PIN DIP switch)

8-PIN DIP switch	RS-485	RS-422
SW1~SW4	On	Off
SW5~SW8	Off	On