

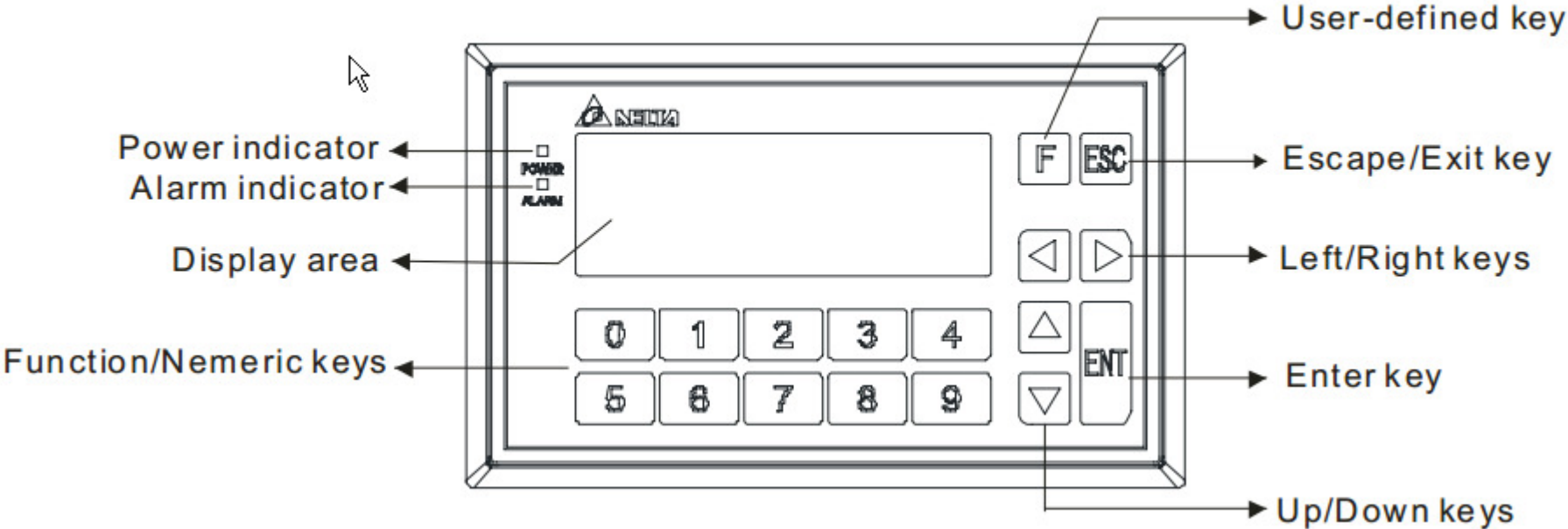
TP04P Operating Direction

2013/09/10



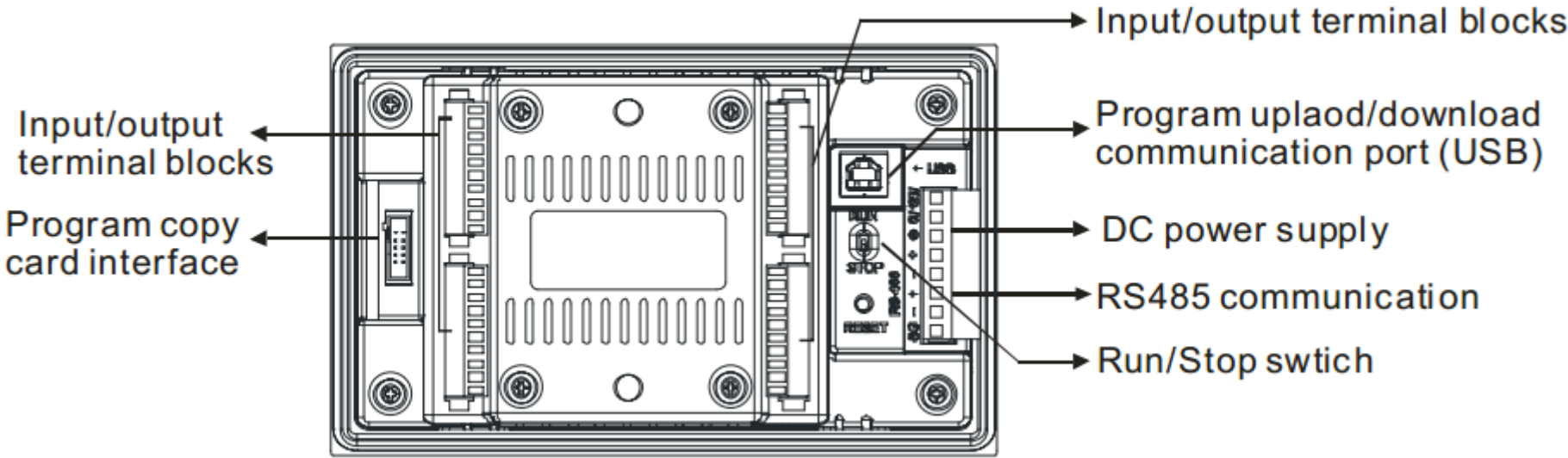
Product Outline and Dimensions

- **Front Panel**



Product Outline and Dimensions

- **Back Panel**



TP Type

| Model Name | Support Point | | | | |
|------------------|-------------------|--------------------|-------------------|--------------------|---------------------------|
| | Digital Input (X) | Digital Output (Y) | Analog Input (AD) | Analog Output (DA) | Temperature input (PT100) |
| TP04P-32TP1R | 16 | 16 | N/A | N/A | N/A |
| TP04P-16TP1R | 8 | 8 | N/A | N/A | N/A |
| TP04P-22XA1R(※1) | 8 | 8 | 4 | 2 | N/A |
| TP04P-21EX1R(※1) | 8 | 8 | 2 (※2) | 1 (※2) | 2 (※2) |

※1: Predict to mass produce in 2013/12/M

※2: Only support for current mode

※3: Only support for PT100 Mode

The range of temperature: -20°C ~ 200°C

Function Specifications

| TP04P Series | |
|---------------------------|---|
| I/O | •8DI+8DO+2AI+1AO+2PT |
| Screen type/Display color | STN-LCD/Monochromatic 4 lines |
| Driver | Delta automation products |
| Alarm LED indicator (Red) | Power indication (Blinking for three times)/Communication error alarm/User program indication |
| Function/Numeric keys | 0~9, ESC, F, Enter and Up/Down/Left/Right keys |
| Program Copy Card | Support (Save TP and PLC Program) |
| Calendar | Support (Battery Type:CR2032) |
| Port | COM1:USB COM2:RS485 (for PLC) COM3:RS485 (for TP) |

Electrical Specifications

| TP04P Series | |
|----------------------------|--|
| Power supply voltage | 24VDC±10% , 0.5A |
| Fuse capacity | 1.85A/30Vdc (Polyswitch) |
| Power protection | With counter-connection protection on the polarity of DC input power |
| Operating temperature | 0~50°C |
| Storage temperature | -20~+60 °C |
| Vibration/Shock resistance | International standards IEC61131-2, IEC 68-2-6 (TEST Fc)/ IEC61131-2 & IEC 68-2-27 (TEST Ea) |
| Dimensions | 163.6X108.6X37 (Width(W) × Height(H) × Deep(D)) |
| Mounting Dimensions | 163X96 (mm) |

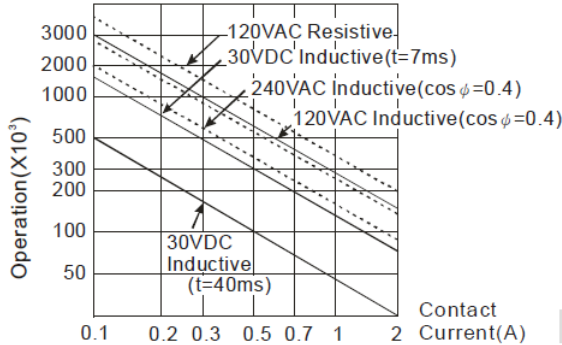
Electrical Specifications

| Input point electrical specifications, single common terminal | |
|---|----------------------------------|
| Input number | X0~X7, (X10~X17) |
| Input type | DC (Sinking or sourcing) |
| Input voltage ($\pm 10\%$) | 24VDC, 5mA |
| Input impedance | 4.7k Ω |
| Maximum frequency | 60Hz |
| Action level | OFF→ON : 15VDC ON→OFF : 5VDC |
| Response time | OFF→ON : <10ms ON→OFF : <15ms |
| filtering time | NO |

Electrical Specifications

| Output point electrical specifications, Relay | |
|--|---|
| Output number | Y0~Y7, (Y10~Y17) |
| Maximum Switching frequency | 1Hz |
| Voltage specifications | 250VAC, <30VDC |
| Current specifications | Resistive : 1.5A /1 point (5A/COM) Inductive : please refer Life curves Lamp : 20WDC/100WAC |
| Maximum frequency | 10kHz |
| Response time | 10ms |

Life curves



[Figure 2]



Electrical Specifications

| Analog input/output Specifications | | |
|------------------------------------|--|--------------------|
| Common Specifications | | |
| Digital data format | 2's complement of 12 bits | |
| Response time | 10ms x channel | |
| Overall accuracy | ±1% when in full scale within the range of 25 °C | |
| Isolation | No Isolation | |
| | Current Input | Current Output |
| channel | 4 Channels | 2 Channels |
| Range of Input/Output | -20~20mA | 0~20mA |
| Range of digital conversion | -2000~2000 | 0~4000 |
| Resolution | 12bits(1LSB=5 μ A) | 12bits(1LSB=5 μ A) |
| Range of absolute input | ±32mA | - |
| Input Impedance | 250 Ω | - |
| Tolerance load impedance | - | 0~500 Ω |



The area of memory

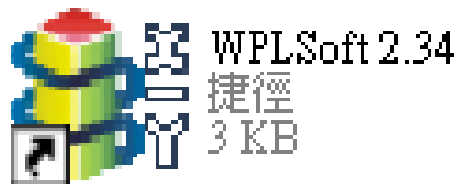
| Item | | Range | |
|------------------|---------------------------------|--|--------------------------------|
| Program capacity | | 7920 steps | |
| Program language | | Instruction + Ladder + SFC | |
| Relay (bit) | X: External input relay | Please refer the corresponded machine spec | |
| | Y: External output relay | Please refer the corresponded machine spec | |
| | M: Auxiliary relay | General purpose | M0~M511; M768~M999;M2000~M2047 |
| | | Latched | M512~M767;M2048~M4095 |
| | | Special purpose | M1000~M1999 |
| | T: Timer | 100ms | T0~T126;T128~T183;T250~T255 |
| | | 10ms | T200~T239;T240~T245 |
| | | 1ms | T127;T246~T249 |
| | C: Counter | 16bits counting up | C0~C111;C129~C299; |
| | | 32bits counting up/down | C200~C223;C224~C232 |
| | S: Step | Initial step | S0~S9 |
| | | Zero return | S10~S19 |
| | | Latched | S20~S127 |
| General purpose | | S128~S911 | |

The area of memory

| Item | | Range | |
|-------------------------|--|---|-------------------------------|
| Register (word data) | T: Timer | T0~T255 | |
| | C: Counter | C0~C199; C200~C254 | |
| | D: Data register | General purpose | D0~D407;D600~D999;D3920~D4999 |
| | | Latched | D408~D599;D2000~D3919 |
| | | Special purpose | D1000~D1999 |
| Index indication | | E0~E7; F0~F7 | |
| Pointer | N: For master control nested loop | N0~N7 | |
| | P: For CJ, CALL instructions | P0~P255 | |
| | I: Interruption | | |
| Constant | Decimal form | K-32768~K32767; K-2147483648~K2147483647 | |
| | Hexadecimal form | H0000~HFFFF; H00000000~HFFFFFFFF | |
| PORT | COM1 | USB , TP/PLC programming | |
| | COM2 | RS485(PLC Mode) | |
| | COM3 | RS485(TP Mode) | |
| Calendar | | Year, Month, Day, Week, Hour, Min, Sec | |

Software Interface

- To do PLC Programming or monitoring for TP04P, please use WPLSoft(V2.34 include or above).



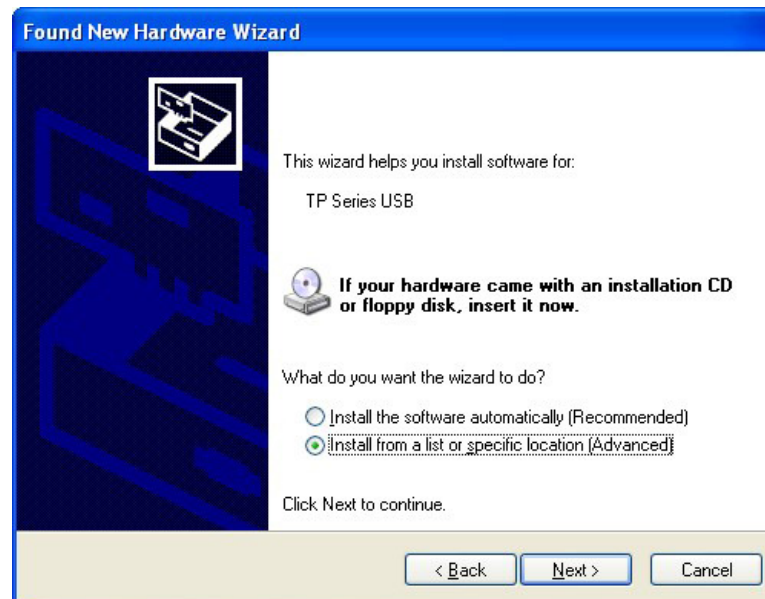
- To do TP programming for TP04P, please use TPEditor (V1.60 include or above).



Driver Installation

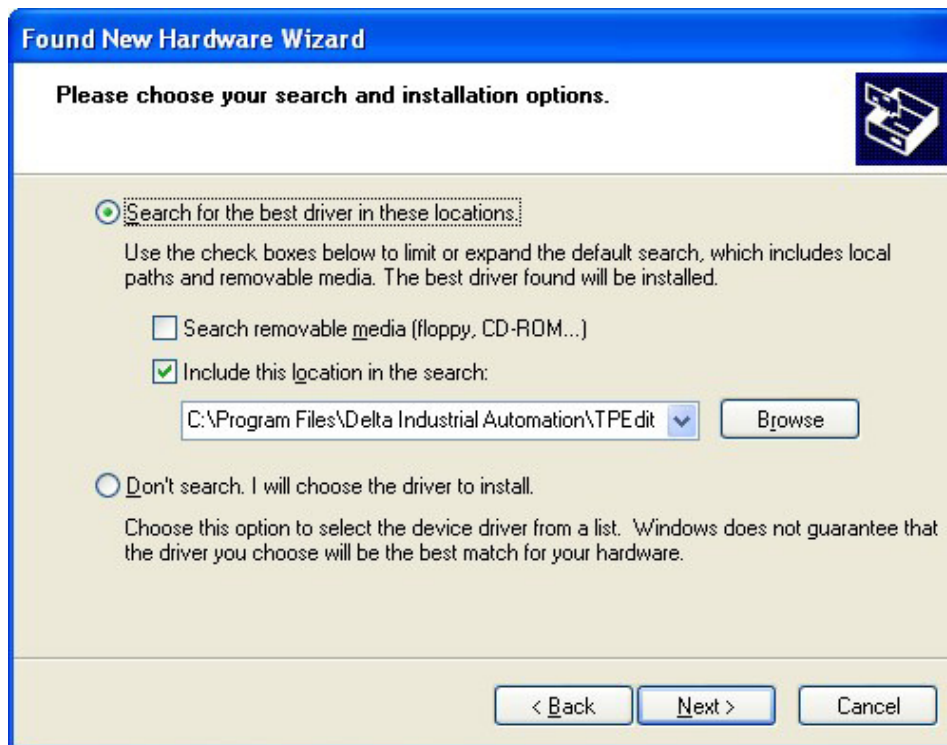
When users use TP04G-BL-CU for the first time, they have to install an USB driver according to the steps listed below :

1. Download the latest version of TPEditor form the Delta website, and install the software.
2. After the USB cable is connected to an USB interface on a computer, TP04G-BL-CU will automatically display a communication transmission screen, and the **Found New Hardware Wizard** window will be displayed on the computer screen. The users have to select the **Install from a list or specific location (Advanced)** option button, and click **Next**.



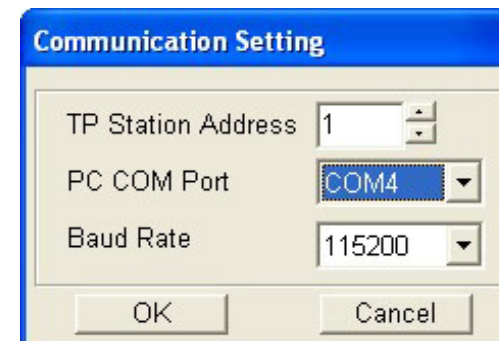
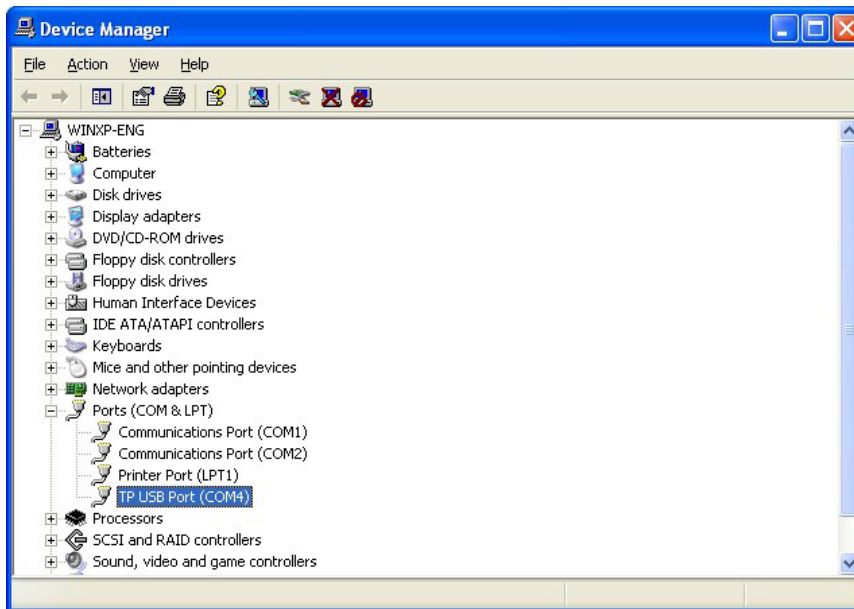
Driver Installation

- 3. The users have to select the **Include this location in the search** checkbox After they select the **USB** folder in the folder where TPEditor is saved (the default path is C:\Program Files\Delta Industrial Automation\TPEditor X.X\USB), they can click **Next**.



Driver Installation

4. After TPEditor is installed, TP *1 and the corresponding port number will appear under the Ports (COM & LPT) section in the Device Manger window. Besides, the same port number will appear in the PC COM Port drop-down list box in the Communication Setting window in TPEditor.
 - *1: If TPEditor version 1.40.1 or below is installed, **TP04G-BK-CU** will appear under the **Ports (COM & LPT)** section in the **Device Manager** window. If TPEditor version 1.60 or above is installed, **TP** will appear under the **Ports (COM & LPT)** section in the **Device Manager** window.



Driver Installation

- 5. TP04G-BL-CU can communicate with the computer through this communication port. Besides, the users can upload/download a program by means of TPEditor.

TP04P Communication Setting

| Port | Interface | Mode |
|------|-----------|---|
| COM1 | USB | Software Mode: Program Download or Upload to PLC by Software. |
| COM2 | RS485 | PLC Mode(Support PLC Link) |
| COM3 | RS485 | TP Mode |

※ First time to use COM1, please refer the [Driver Installation](#).

COM2 Specifications

COM2 supports the communication between TP04P and PLC. To modify the communication format, following setting in the table must be added to the PLC Program first. When a PLC is from stop to run, the M1120 is be detected in the first scan time. While M1120 is on, the setting of COM2 is modified according to the value of D1120.

| | |
|-------|-------------------------------------|
| D1120 | The setting of communication format |
| M1120 | Communication setting remains |
| D1121 | The station address setting of COM2 |
| M1143 | The setting of RTU/ASCII Mode |
| D1129 | The setting of communication delay |

Attention :

- Please don't use any communication instruction in the program when COM2 is used for slave station.
- After modifying a communication format, let PLC RUN→STOP and the communication format will not change.
- While the power of PLC is turned off and then turn on, the communication format will return to factory setting.

D1120 Specifications :

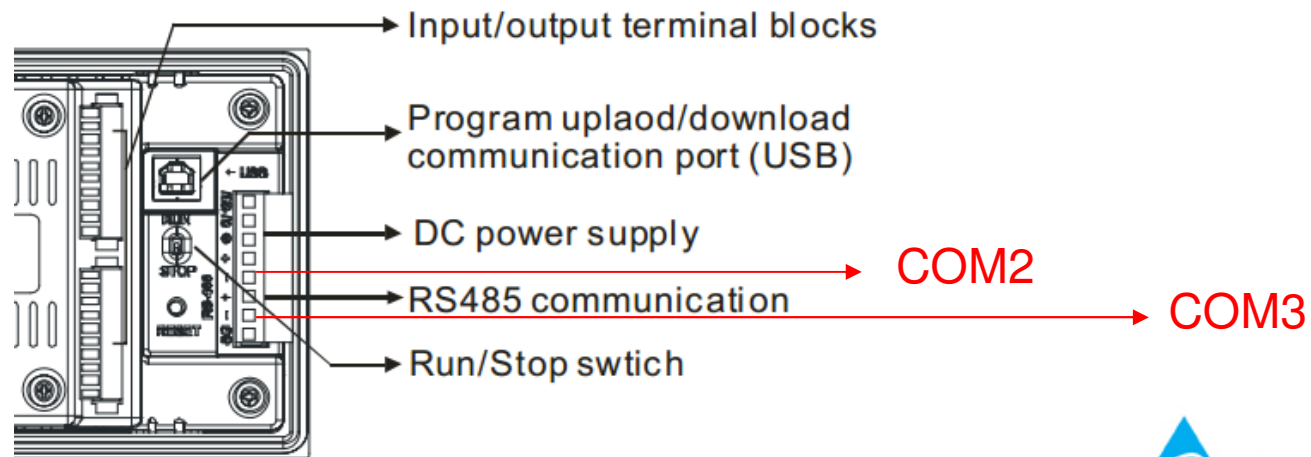
| | Content | | 0 | | 1 |
|---------|------------------------|------|--------------|---------|---------------|
| b0 | Data length | | b0=0 : 7 | | b0=1 : 8 |
| b2, b1 | Parity bit | | b2, b1=00 | : | None |
| | | | b2, b1=01 | : | Odd |
| | | | b2, b1=11 | : | Even |
| b3 | stop bits | | b3=0 : 1 bit | | b3=1 : 2 bit |
| b7~b4 | b7~b4=0001 | (H1) | : | 110 | bps |
| | b7~b4=0010 | (H2) | : | 150 | bps |
| | b7~b4=0011 | (H3) | : | 300 | bps |
| | b7~b4=0100 | (H4) | : | 600 | bps |
| | b7~b4=0101 | (H5) | : | 1,200 | bps |
| | b7~b4=0110 | (H6) | : | 2,400 | bps |
| | b7~b4=0111 | (H7) | : | 4,800 | bps |
| | b7~b4=1000 | (H8) | : | 9,600 | bps |
| | b7~b4=1001 | (H9) | : | 19,200 | bps |
| | b7~b4=1010 | (HA) | : | 38,400 | bps |
| | b7~b4=1011 | (HB) | : | 57,600 | bps |
| | b7~b4=1100 | (HC) | : | 115,200 | bps |
| b8 | Select start bit | | b8=0 : None | | b8=1 : D1124 |
| b9 | Select the 1st end bit | | b9=0 : None | | b9=1 : D1125 |
| b10 | Select the 2st end bit | | b10=0 : None | | b10=1 : D1126 |
| b15~b11 | Not defined | | | | |

The example of COM2 Communication (Master Mode)

When TP04P is PLC mode, please use COM2 of TP04P for connection.

For example, TP04P connect to DVP28SV PLC. TP04P(PLC Mode) is a master and DVP28SV is a slave. The following demo code shows how TP04P controls the Y0 of DVP28SV PLC .

Step1:Connect TP04P(COM2) with DVP28SV PLC (RS-485)



The example of COM2 Communication (Master Mode)

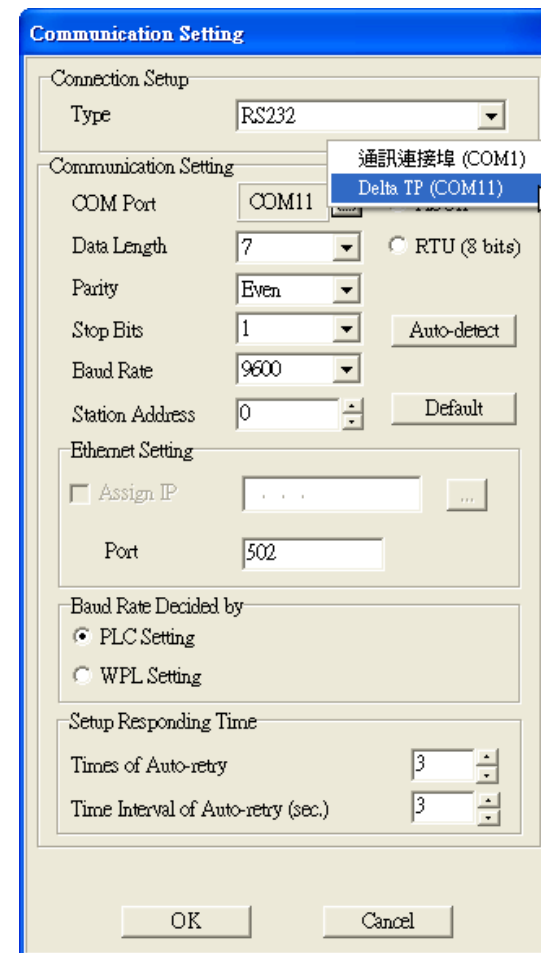
Step2:Connect TP04P with PC by USB cable.

Step3:Communication setting (right picture)

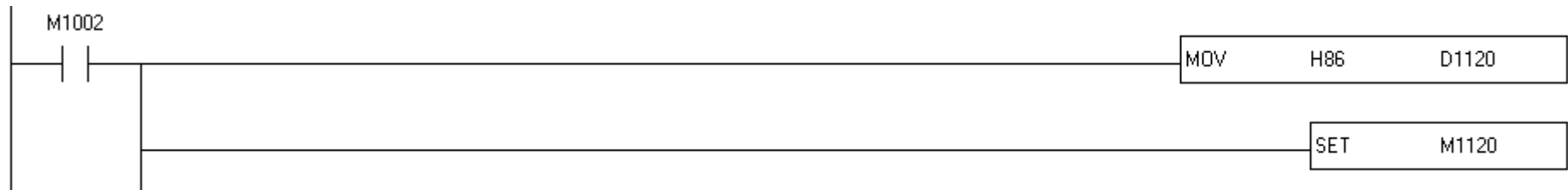
Please select “Delta TP” for COM port.

Step4:Edit the program by WPL or ISP
software.

(WPL is applied for this example.)



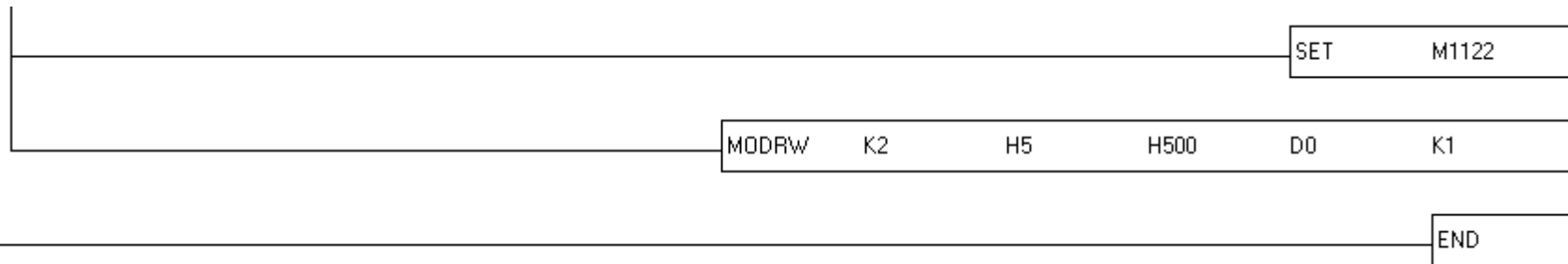
The example of COM2 Communication (Master Mode)



Please refer [COM2 Specifications](#) and D1120 Specifications in this PowerPoint.

1. H86 in D1120 indicates the format:
9600 bps,7 data bits, even parity ,1 stop bit.
2. “Set M1120” indicates that the format of communication is determined, so PLC from run to stop the format will not change.

The example of COM2 Communication (Master Mode)



3. “Set M1122” indicates that master starts to send message to the slave.
4. MODRW is a Modbus instruction of PLC. Please refer the DVP Operation Menu (could download from the web of Delta). A PLC to be a master , the Modbus instruction must be used.
However, a PLC to be a slave , the Modbus instruction is not be allowed in the program.
5. H500 is a communication address of Y0.

Step5: Download the program to TP04P and execute it.
Then the Y0 of DVP28SV is be turned on.

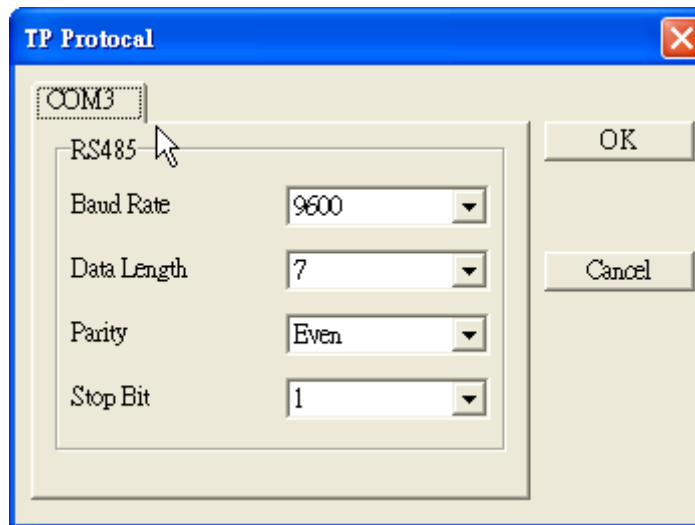
COM2 Communication

(Slave Mode)

1. TP04P(PLC Mode) to be a slave, please check that there is no Modbus instruction in the program.
2. TP04P combines the PLC and TP. In this case, TP04P TP part is a Master, and TP04P PLC part is a slave.
3. TP04P (PLC Mode) is also can be a slave controlled by the other PLC . While this application is not common.
4. Please use COM2 to connect with the other devices.

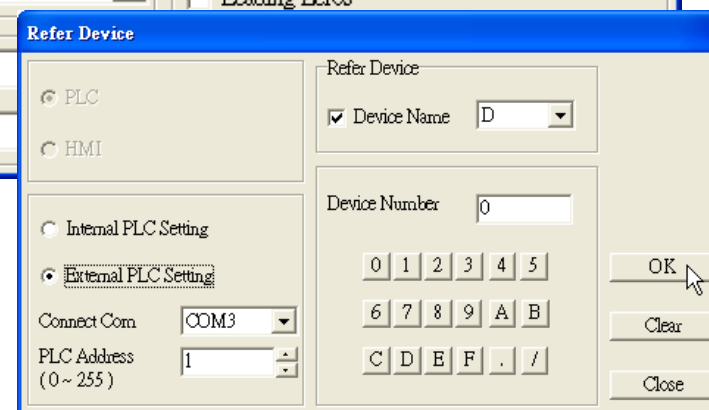
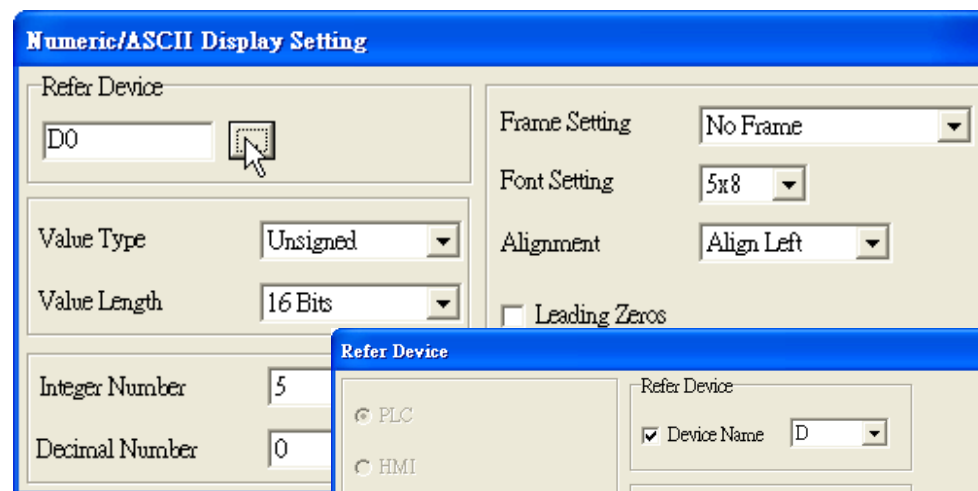
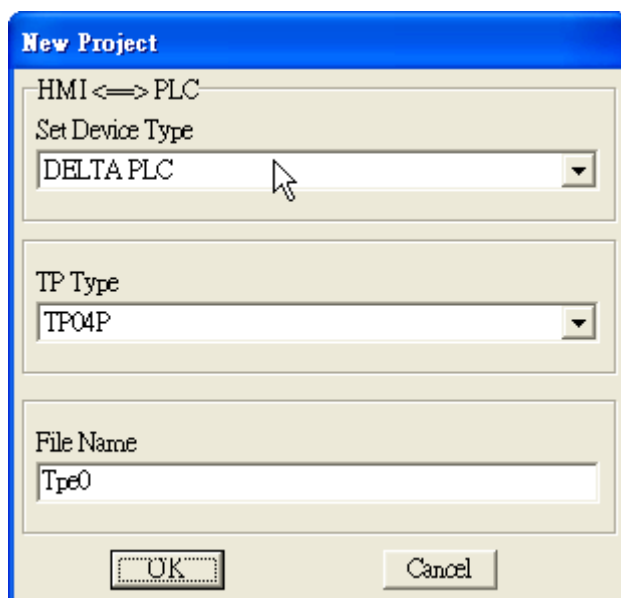
The example of COM3 Communication (Master Mode)

- In a Master mode, COM3 supports 255 devices connection at most.
- The communication format of COM3 can be modified by “TP protocol setting” in the tools item of TPEditor.



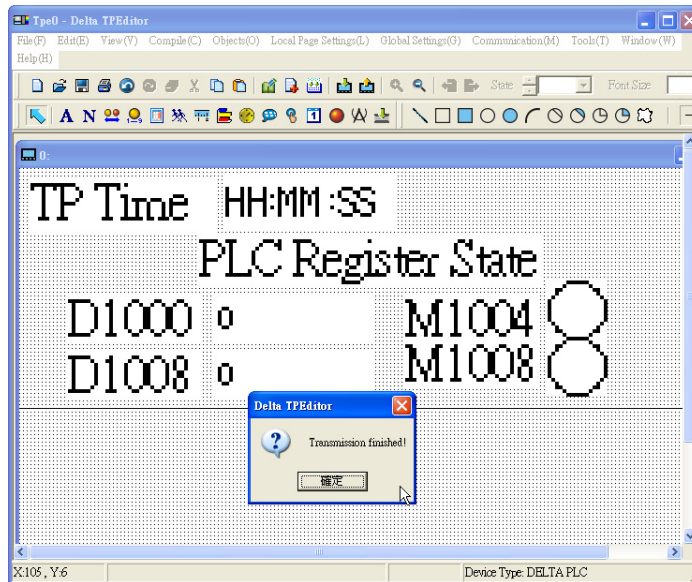
The example of COM3 Communication (Master Mode)

- Use a COM3(Master)and DVP PLC (Slave) connection to read the internal register state of PLC.
1. Choose the Device (DELTA PLC) 2.To edit objects , please choose “External PLC Setting” and remember to set the PLC Address in the Refer Device page .



The example of COM3 Communication (Master Mode)

3. After Editing, click the “Build All” button, and then click the “Write to TP” button.



4. Connect TP04P COM3 and RS485 Port of DVP PLC, then the two devices is connected successfully.

To learn more about Delta,
please visit www.deltaww.com

