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# DOP/TP

## DELTA Human Machine Interface



www.delta.com.tw/industrialautomation


# Human Machine Interface

*DUPI/TP*

**Various dimensions, display size and performance for a wide range of industrial applications**

Performance

**TP Series**




TP08  
Monochrome STN  
Display max. 8 lines text

TP05  
Monochrome STN  
Display max. 5 lines text

TP04  
Monochrome STN  
Display max. 4 lines text

TP02  
Monochrome STN  
Display max. 2 lines text


**3.8"Series**



AS38  
8 Shades of Blue STN  
USB HOST

AS57  
8 Shades of Blue STN  
USB HOST

**5.7"Series**



AE57  
8 Shades of Blue STN  
Extension Interface SM Card

16 Shades of Gray FSTN  
Extension Interface SM Card


256 Colors STN  
Extension Interface SM Card

A57  
8 Shades of Blue STN  
SM Card

16 Shades of Gray FSTN  
SM Card

256 Colors STN  
SM Card


**8"Series**



AE80  
65536 Colors TFT  
USB HOST  
Extension Interface SM Card


A80  
65536 Colors TFT  
USB HOST

**9.4"Series**



AE94  
8 Shades of Blue STN  
USB HOST  
Extension Interface

**10.4"Series**



AE10  
65536 Colors TFT  
USB HOST  
Extension Interface SM Card

A10  
256 Colors TFT  
SM Card

Dimensions

Series	TP02	TP04	TP05	TP08	AS	
Display Size	72*22mm	3"(67*32mm)	3.8"(83*41mm)	3.8"(83*41mm)	3.8	5.7
Resolution	160*32	128*64	160*80	240*128	320*240	320*240
Display Color	Monochrome	Monochrome	Monochrome	Monochrome	8 Shades of Blue	8 Shades of Blue
Flash Memory	256K		512K	512K	1M	1M
SRAM	N/A			128K	128K	128K
Function Key	16	12	24	24	4+SYS	4+SYS
USB HOST	N/A	N/A	N/A	N/A	YES	YES
SM Card	N/A	N/A	N/A	N/A	N/A	N/A
Extension Module	N/A	N/A	N/A	N/A	N/A	N/A
Serial Communication	COM * 2	COM * 2	COM * 2	COM * 2	COM * 3	COM * 3
Editing Software	TPEditor				Screen Editor	

	A			AE			
	5.7	8	10.4	5.7	8	9.4	10.4
	320*240	640*480	640*480	320*240	640*480	640*480	640*480
8 Shades of Blue 16 Shades of Gray 256 Colors*	65536 Colors	256 Colors	8 Shades of Blue 16 Shades of Gray 256 Colors*	65536 Colors	8 Shades of Blue	65536 Colors	65536 Colors
	3M	7M	7M	3M	7M	7M	7M
	256K	512K	256K	512K	512K	512K	512K
	4+SYS	6+SYS	7+SYS	4+SYS	6+SYS	11+SYS	7+SYS
	N/A	YES	N/A	N/A	YES	YES	YES
	YES	N/A	YES	YES	YES	N/A	YES
	N/A	N/A	N/A	YES	YES	YES	YES
	COM * 2	COM * 3	COM * 2	COM * 3	COM * 3	COM * 3	COM * 3
	Screen Editor			Screen Editor			

\* The maximum visual performance of the 256 colors models is 256 colors. However, in order to make the created elements to be displayed with more brilliant colors, the ScrEdit software (Screen Editor, the program editor of Delta HMI product) only provides 144 colors for user settings.

## Features of HMI

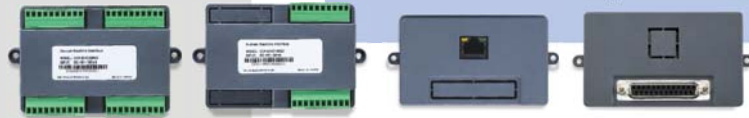
### Extension Module

Offer various kinds of optional extension modules to extend the HMI functionality.

Extension Printer Module: Used to connect to printer

Extension DIO Module: Match the need for display, control and operation all-in-one application

Extension Ethernet Module: Peripheral equipment can be connected by Ethernet Module. The ability to long-distance data transmission enables fast and effective monitoring and controlling.



### Display

Full-color Display:

Offer many different displays for the user to produce colorful, bright and high-resolution images. Max. 65536 colors TFT LCD display is provided. Clear and realistic images and graphs can be easily created.

### Transferring Data

Rapid USB Download: Efficiently reduce download time by using USB high-speed transmission interface.

USB flash drive for Copying Screen Data: USB flash drive is used to copy the HMI screen data. It also provides password protection and can limit the frequency of copying the screen data. Using USB flash drive can protect screen data effectively and achieve easier maintenance of remote equipment.

### Printer

HMI can be connected to different kinds of inkjet printers and dot matrix printers by using USB Host or Extension Printer Module.



### Communication

Serial Communication Interface: Support up to three COM ports for serial communication. It can connect to multiple controllers in serial simultaneously. Besides Delta industrial automation products, Delta HMI product can also support more than twenty well-known brands of controllers and continue to increase.

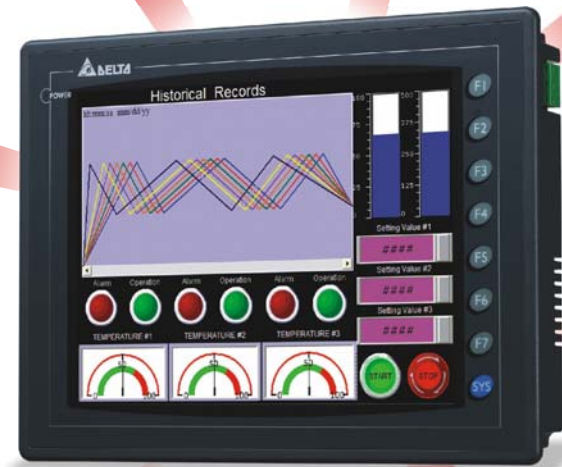


### Fast Operation

PLC program can be upgraded and maintained via HMI. It provides fast operation with less wiring and less connections.

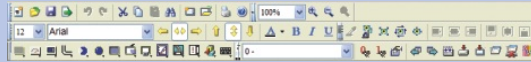
### Saving Data

Screen data, history records and recipes can be easily saved through SM card or USB flash drive.



## HMI Software Editor - Screen Editor

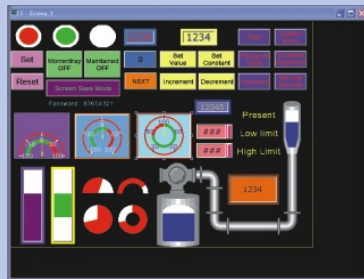
Easy-to-understand Toolbar:  
Easily execute any editing operation by using the icons on Toolbar.



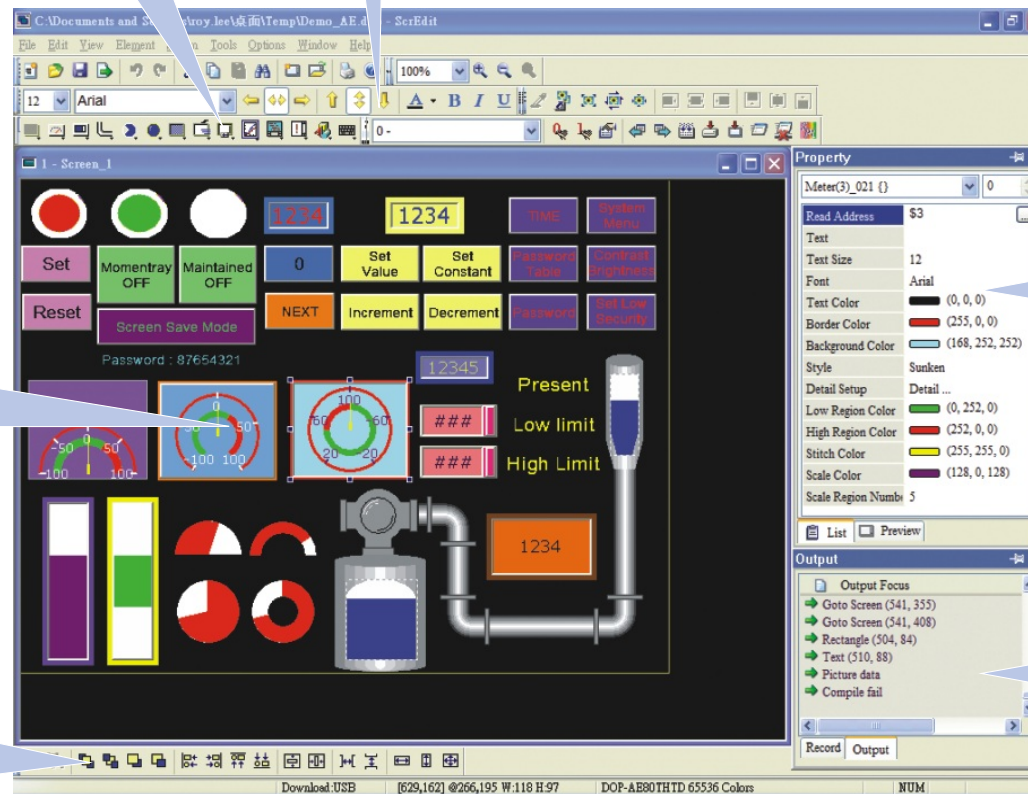
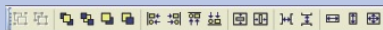
Element Toolbar:  
Various elements satisfy the needs of all applications.



Work Place (Drawing Area):  
The user can create and edit all elements here.  
The work place will change to different size automatically depending on selected HMI model.



Layout Toolbar:  
It helps the user to align, position the element and also allows the user to make the element be the same size.

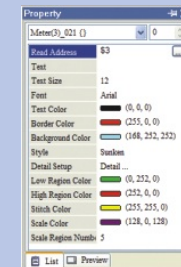


### Recommend System Requirements of Screen Editor:

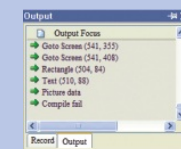
Item	System Requirement
CPU	Pentium III 500MH or higher
Memory	256 MB or more of available space is needed.
Hard Disk	400 MB or more of available space is needed.
Display	Display resolution of 800 x 600 or more is recommended.
Printer	Printer that is compatible with Windows 2000/WindowsXP
OS	Windows 2000/WindowsXP

The user can download the Screen Editor, the program editor of Delta HMI product and the user manual via the following link: <http://www.delta.com.tw/industrialautomation/>.

Property Table:  
It provides element property settings for each element.



Output Window:  
All editing actions and output messages will be shown here when compile is finished.

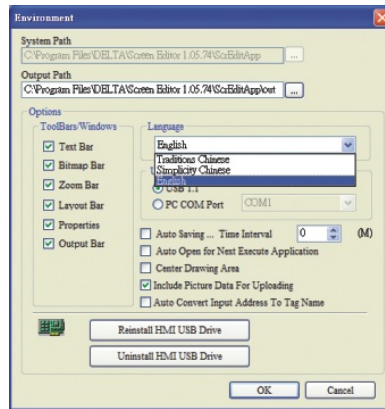




## Software Features

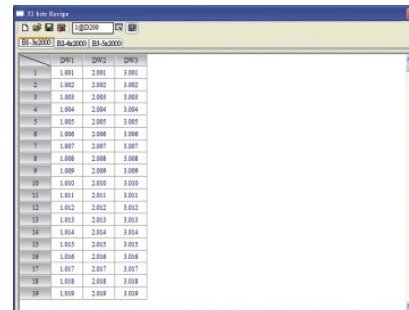
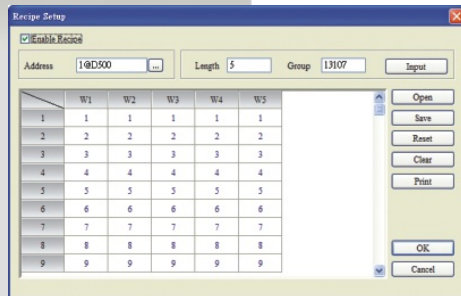
### Multi-Language Interface

3 viewable languages are provided: Traditional Chinese, Simplified Chinese and English. More languages support, such as Korean, Turkish, etc. will be available soon.



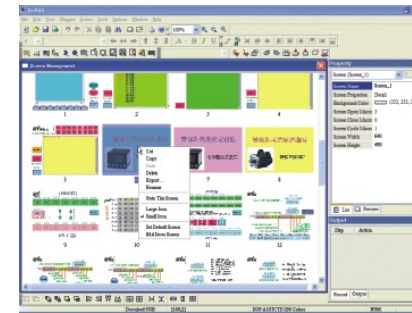
### Flexible Recipe Function. 32-bit recipe is supported.

Simple recipe editing function can save parameter values to HMI and command the controller to change the parameters. This is convenient for different production process change. Support 32-bit floating point format for high-precision production process. The recipes can be saved to SM Card or USB flash drive. Besides, CSV file data is allowed and can also be edited.



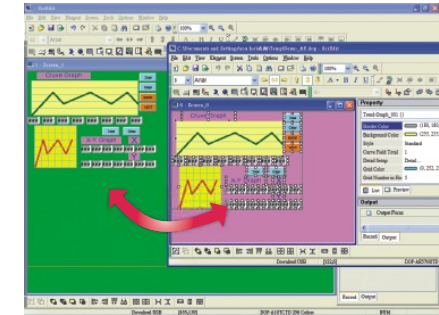
### Convenient Screen Management

Use HMI screen management function can easily manage the designed screen.



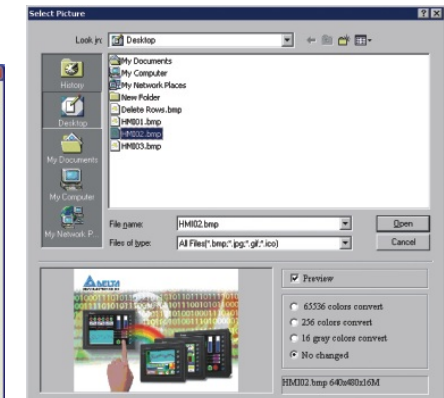
### Multi-Screen Editing

Screen Editor allows the user to edit several projects at the same time. The user can work on different screens and copy the images or data from one project to another.



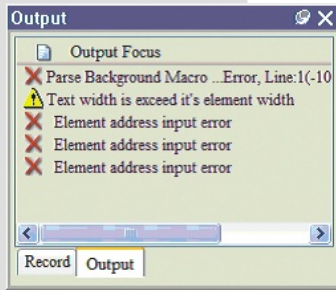
### Picture Bank

The user can use this option to import various pictures (\*.bmp, \*.gif, \*.jpg, \*.ico) to enrich the screen selection and make the Picture Bank more plentiful. The picture can be converted to different color according to different types of models.



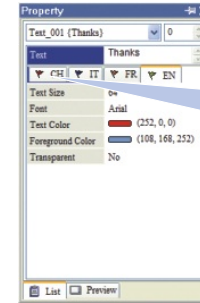
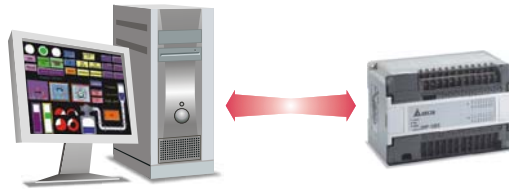
## Software Features

### Easy Debugging

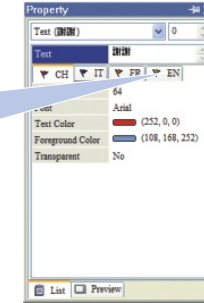


Once an error occurs when compile is finished, the error message will display in Output Window. Then, the user can know where the error occurs and proceed debugging immediately

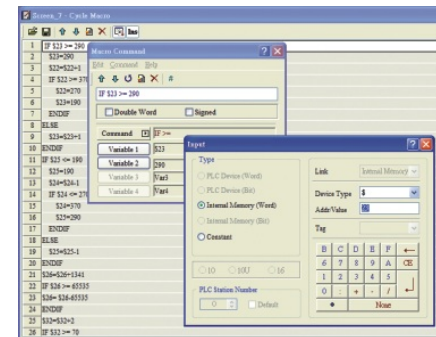
The user also can perform debugging without HMI. To save the design time, the on-line / off-line simulation function can be easily executed by using just PC software.



Chose different tab to switch to different language.



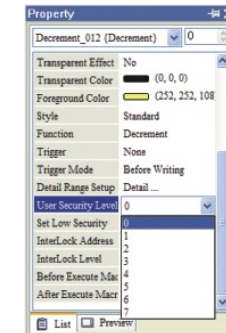
### Macro Editing Function



Powerful macro commands provide four fundamental operations of arithmetic, condition judgments, data move and the operation of floating points. Using macro editing function can reduce the PLC program editing efficiently. Easy-to-learn interface provides good flexibility in use and lets the user have more selection for program editing. Communication macro commands are also provided and the user can transmit and receive data through COM port to control the special equipment.

### User Security Level

Provide 8 security levels with password protection for the authorization control for different elements.



### Multilingual Display

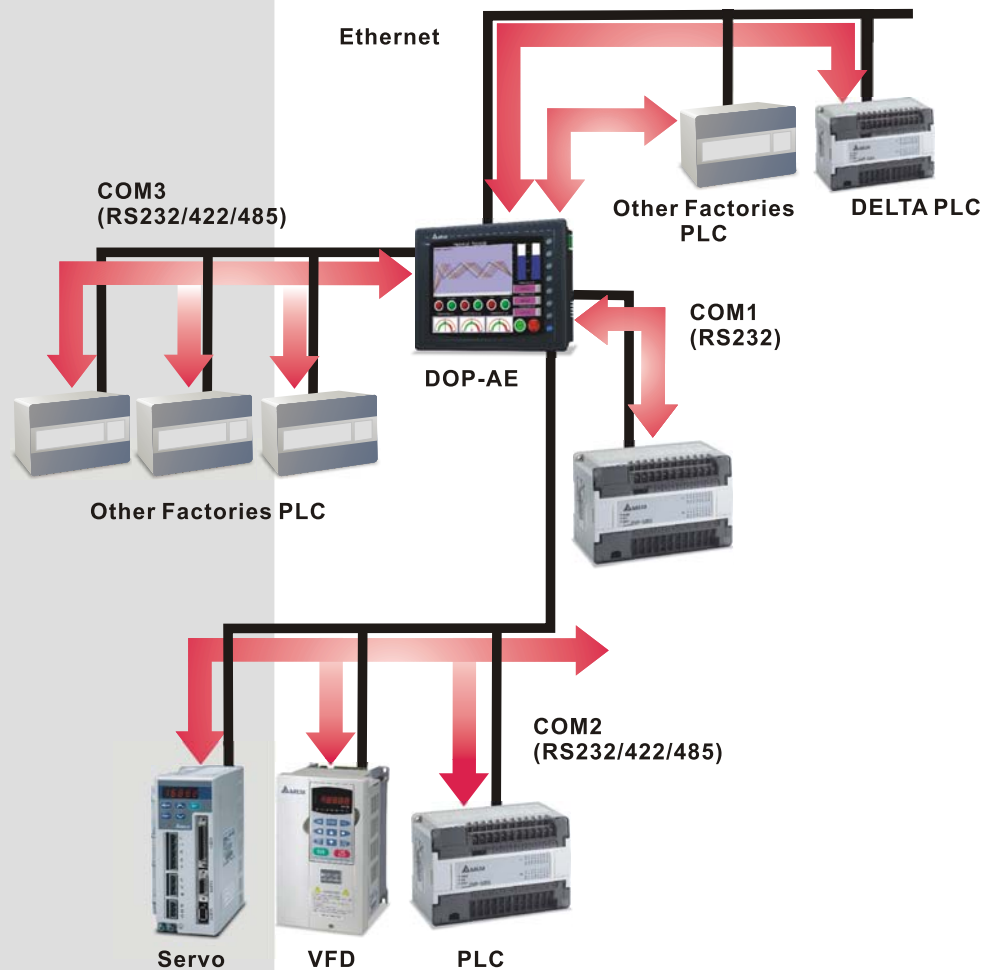


Max. 8 user-defined languages can be displayed on HMI screen by simple software editing. It is easy for the user to switch the desired language and let your equipment keep track with the international standard.

## Other Features

### Four kinds of controllers can be connected simultaneously (DOP-AE series only)

DOP-AE series supports up to 3 COM ports for serial communication. In addition to COM ports, if the user also connects an extension Ethernet module, then the DOP-AE series can connect to four kinds of external controllers at the same time. An ultimate central control system for factory control is completed.



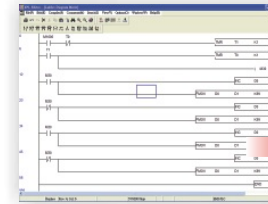
### Optional Extension Module

AE series HMI product can connect to various kinds of optional extension modules to extend the HMI functionality through the extension interface located on the rear cover.



**Extension DIO Module:**  
Extension DIO Module working with the built-in SPL editing interface of Screen Editor can complete HMI to be an all-in-one, cost-effective controller with excellent control performance for display, control, and operation.

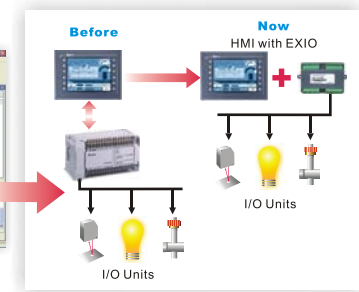
SPL editing PLC program



Screen Editor Editing Screen



Easily achieve all-in-one requirement for display, control, and operation



### Extension Printer Module:

When a USB Host is connected to a USB flash drive, the user can use this module and connect to a printer.



### Extension Ethernet Module:

Using the Extension Ethernet Module can connect peripheral equipment and create a network of HMI and peripheral equipment. The transmission distance will no longer be limited. It supports Modbus communication on TCP/IP and will increase other compatible communication protocols for Ethernet soon.





## TP Feature

## TPeditor

### Backlight ON/OFF Control via Software

Backlight ON/OFF control via software  
Auto Screen change function:  
The ON/OFF status of backlight and auto screen function can be controlled via parameter settings of TPEditor Software.

5 Lines Display for TP05  
160 x 80 pixels

8 Lines Display for TP08  
240 x 128 pixels



Function Keys (User-defined):  
F1-F5 New functions are: Recipe Write/Read,  
Screen Scroll function

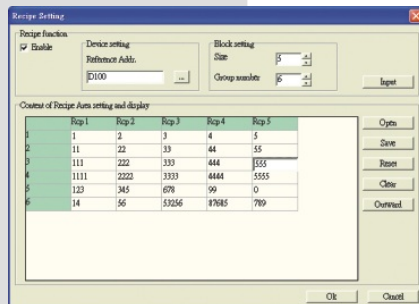
Extension Port for Program Copy Card  
(TP-PCC01):  
TP series provides optional Program Copy Card (TP-PCC01) to copy user program. The user can easily read and write data and program from TP series without using TP Editor Software rapidly.



RS-232/422/485  
Two serial COM ports for flexible and wide applications

### Product Performance

**Feature 1.** Screen Scroll Function  
This function can divide screen into 2 parts and the user can use function key to scroll the screen



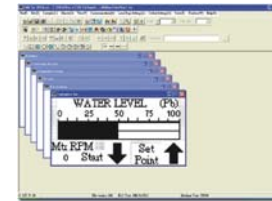
**Feature 2.** Recipe function / User interface  
Provide the same recipe function as HMI to enhance application performance of TP series.

**Feature 3.** Large Displaying Screen  
Offer the best viewing experience and operation environment. Max. 8 lines of text can be displayed.

**Feature 4.** New Macro Command  
Support new macro commands in common use, such as process control, arithmetic operation, bit settings and data move, etc. macro commands.

### Software Editor--TPEditor

TPEditor provides Windows fonts for editing and page program self-debug. It has numerous functions, including button, numeric input / display, meter, lamp, messages display with both text and graphs and it supports multiple brands' controllers.



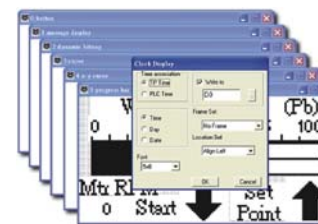
### Page Change Control

Page can be set as invisible. The user can change page by different conditional controls.



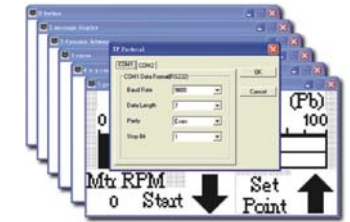
### Real Time Clock

It's built-in real time clock (Not for TP02G). It can transfer time data to the PLC that doesn't have real time clock function to have time control function.



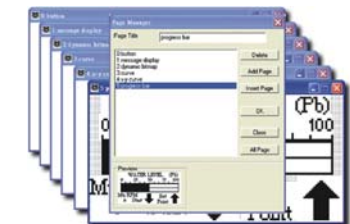
### Communication

COM1 and COM2 can be used for the same communication protocol with different format controllers to construct single or multiple-drop link.



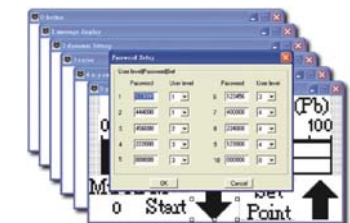
### Page Management

It is convenient for the user to preview page quickly and execute add, delete and insert functions for page.



### User Security Level

It provides 5 security levels with password protection and 10 sets of user passwords for flexible handling.





## TPEditor

## HMI Specifications

### Property Table Setting

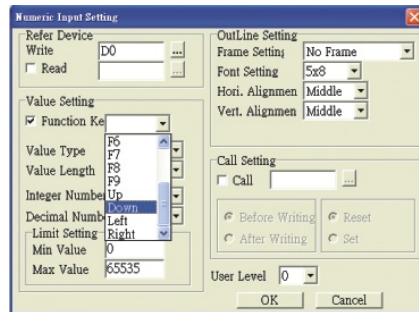
For better and faster settings, a detachable property table is provided for the user to view and edit in TP more efficiently. The user can choose traditional method of editing the programs and objects or use property table to work in TP.

Property	
<input checked="" type="checkbox"/> Basic Info	{Left,Top,Width,Height}
Write Device Address	D0
HMI Port	COM1
Unit Address	1
Read Setting	No
Call Setting	No
Function Key Setting	No
User Level	0
Frame Setting	No Frame
Font Setting	5x8
Hori. Alignment	Middle
Vert. Alignment	Middle
Value Type	Unsigned
Value Length	16 Bits
Integer Number	5
Decimal Number	0
Max. Value	65535
Min. Value	0

### Operator Keys

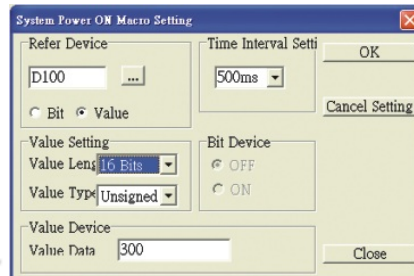
Numeric & Other Function Keys (User-defined)  
 Numeric Keys: 0-9, decimal point, +/-  
 Movement Keys : Up and Down  
 Other Function Keys: Backspace, Shift, Clear (CLR), Enter (ENT) Including F1-F5, total 23 convenient user-defined function keys provided for operation.

System-defined Keys: ESC. It is not user-defined function key.



### System Power On Macro

TPEditor has simple Macro command editing function. When TP series power on, after a predefined time interval, Macro command will be executed automatically. This is very convenient for initial state setup.



MODEL		AS38BSTD(-W)	AS57BSTD	A(E)57BSTD(-W)	A(E)57GSTD(-W)	A(E)57CSTD(-W)
LCD MODULE	Display Type	3.8" STN LCD (8 Shades of Blue)	5.7" STN LCD (8 Shades of Blue)	5.7" STN LCD (8 Shades of Blue)	5.7" FSTN LCD (16 Shades of Gray)	5.7" STN LCD (256 colors) <sup>(Note 2)</sup>
	Resolution	320 x 240 pixels	320 x 240 pixels	320 x 240 pixels	320 x 240 pixels	320 x 240 pixels
	Back Light	LED Back Light (about 10 thousand hours at 25°C)	CCFL Back Light (about 50 thousand hours at 25°C)			
	Display Size	3.8 (76.8 x 57.6mm)				
Operation System		Windows Base Real Time OS				
MCU		32-bit RISC Micro-controller / 206.4MHz				
NOR Flash ROM		NOR Flash ROM 2 Mbytes (System: 1MB / User: 1MB)	NOR Flash ROM 2 Mbytes (System: 1MB / User: 1MB)	NOR Flash ROM 4 Mbytes (System: 1MB / User: 3MB)		
SDRAM		4 Mbytes	16 Mbytes	16 Mbytes		
EXT. Memory	Backup Memory (Bytes)	128K	128K	A : 256K AE : 512K	A : 256K AE : 512K	A : 256K AE : 512K
	SM Card			✓	✓	✓
Extension Interface	USB Host (Ver 1.1)	✓	✓			
	USB for Download [USB Client]	1 USB Client Ver 1.1				
	USB for Data Storage / Printer [USB Host]	✓	✓			
Serial COM Port	COM1	RS-232	RS-232	RS-232	RS-232	RS-232
	COM2	RS-422/485	RS-422/485	RS-422/485	RS-422/485	RS-422/485
	COM3	RS-232	RS-422/485	RS-232/422/485(AE)	RS-232/422/485(AE)	RS-232/422/485(AE)
Function Key		User defined key x 4 + System key (SYS) x 1				
Operation Voltage		DC +24V (-10% ~ +15%) (Please use isolated power supply) <sup>(Note 3)</sup>				
Backup Battery		3V lithium battery CR2032 x 1 / battery life: 5 years				
Buzzer		85dB				
Perpetual Calendar (RTC)		Built-in				
Cooling Method		Cooling Method				
Safety Approval (Waterproof for front panel)		IP65 / NEMA4 / CE, UL <sup>(Note 1)</sup>				
Operating Temp.		0°C to 50°C				
Storage Temp.		-20°C to +60°C				
Ambient Humidity		10% ~ 90% RH [0~40°C] ; 10% ~ 55% RH [41~50°C]				
Vibration Resistance		IEC61131-2 compliant When vibration is NOT continuous: 5Hz-9Hz 3.5mm, 9Hz-150Hz 1G When vibration is continuous: 5Hz-9Hz 1.75mm, 9Hz-150Hz 0.5G X, Y, Z directions for 10 times				
Dimensions (W) x (H) x (D) mm		140.8 x 104.8 x 44.8			184.1 x 144.1 x 47	
Panel Cutout (W) x (H) mm		118.8 x 92.8			172.4 x 132.4	
Weight		Approx. 310g			Approx. 760g	

1) Only DOP-AE94BSTD is not UL recognized. The application is in progress.  
 2) The maximum visual performance of the 256 colors models is 256 colors. However, in order to make the created elements to be displayed with more brilliant colors, the ScrEdit software (Screen Editor, the program editor of Delta HMI product) only provides 144 colors for user settings.  
 3) The user please use isolated power supply except DOP-AE80THTD, DOP-AE94BSTD, DOP-AE101THTD these models.  
 4) The user can download the Screen Editor, the program editor of Delta HMI product and the user manual via the following link: <http://www.delta.com.tw/industrialautomation/>.

# Human Machine Interface

## HMI Specifications

## TP Specifications



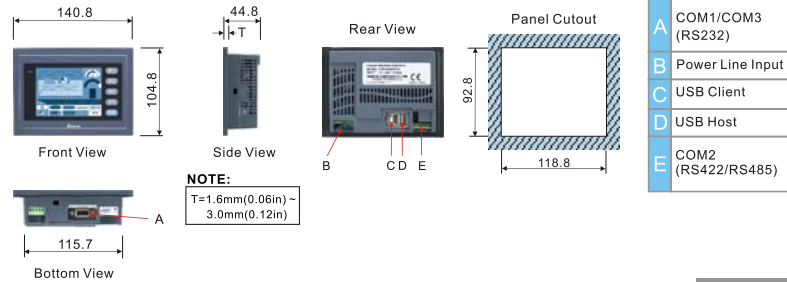
MODEL		A80THTD1 / AE80THTD	AE94BSTD	A10TCTD / AE10THTD					
LCD MODULE	Display Type	8" TFT LCD (65536 colors)	9.4" STN LCD(8 Shades of Blue)	10.4" TFT LCD (A: 256 colors <sup>(Note 2)</sup> /AE: 65536 colors)					
	Resolution	640 x 480 pixels	640 x 480 pixels	640 x 480 pixels					
	Back Light	CCFL Back Light (about 50 thousand hours at 25°C)	CCFL Back Light (about 30 thousand hours at 25°C)	CCFL Back Light (about 30 thousand hours at 25°C)					
	Display Size	8 (162.2 x 121.7mm)	9.4 (192.0 x 144.0mm)	10.4 (211.2 x 158.4mm)					
Operation System					Windows Base Real Time OS				
MCU					32-bit RISC Micro-controller / 206.4MHz				
NOR Flash ROM					NOR Flash ROM 8 Mbytes (System: 1MB / User: 7MB)				
SDRAM					32 Mbytes				
Backup Memory (Bytes)					512K				
EXT. Memory	SM Card	✓ (AE)		✓					
	USB Host (Ver 1.1)	✓	✓	✓ (AE)					
Extension Interface					✓ (AE)				
USB for Download [USB Client]					1 USB Client Ver 1.1				
USB for Data Storage / Printer [USB Host]					✓				
Serial COM Port	COM1	RS-232	RS-232	RS-232					
	COM2	RS-232/422/485	RS-232/422/485	RS-232/422/485					
	COM3	RS-232/422/485	RS-232/422/485	RS-232/422/485					
Function Key					User defined key x 6 + System key (SYS) x 1				
Operation Voltage					DC +24V (-10% ~ +15%) (Please use isolated power supply) <sup>(Note 3)</sup>				
Backup Battery					3V lithium battery CR2032 x 1 / battery life: 5 years				
Buzzer					85dB				
Perpetual Calendar (RTC)					Built-in				
Cooling Method					Cooling Method				
Safety Approval (Waterproof for front panel)					IP65 / NEMA4 / CE, UL <sup>(Note 1)</sup>				
Operating Temp.					0°C to 50°C				
Storage Temp.					-20°C to +60°C				
Ambient Humidity					10% ~ 90% RH [0~40°C] , 10% ~ 55% RH [41~50°C]				
Vibration Resistance					IEC61131-2 compliant When vibration is NOT continuous: 5Hz-9Hz 3.5mm, 9Hz-150Hz 1G When vibration is continuous: 5Hz-9Hz 1.75mm, 9Hz-150Hz 0.5G X, Y, Z directions for 10 times				
Dimensions (W) x (H) x (D) mm					243.1 x 178.1 x 52.4				
Panel Cutout (W) x (H) mm					231.4 x 166.4				
Weight					Approx. 1140g				

MODEL		TP02G-AS1	TP04G-AS2	TP05G-BS2	TP08G-BS2
LCD MODULE	Display Type	STN LCD			
	Display Color	Monochrome			
	Resolution	160 x 32	128 x 64	160 x 80	240 x 128
	Back Light	about 50 thousand hours at 25°C			
	Display Size	72 x 22mm	3"(67*32mm)	3.8" (83 *41mm)	
MCU		Hitachi 3064		STR710RZ	
Flash Memory		256K Byte		512K Byte	
Program Download Port		COM1(RS232)			
Serial COM Port	COM1	RS232	RS232/422		
	COM2	RS485			
Extension Interface		Program Copy Card			
Perpetual Calendar (RTC)		N/A	Built-in		
Function Key	System Key	6	7	12	
	Function Key	10	5	12	
Operation Voltage		DC +24V (-10% ~+20%)			
Backup Battery		3V lithium battery CR2032 x 1 / battery life: 5 years			
Buzzer		85dB			
Cooling Method		Natural air circulation			
Operating Temp.		0°C to 50°C			
Storage Temp.		-20°C to +60°C			
Ambient Humidity		10% ~ 90% RH [0~40°C]			
Vibration Resistance		IEC61131-2 compliant When vibration is NOT continuous: 5Hz-9Hz 3.5mm, 9Hz-150Hz 1G When vibration is continuous: 5Hz-9Hz 1.75mm, 9Hz-150Hz 0.5G X, Y, Z directions for 10 times			
Dimensions (W) x (H) x (D) mm		147 x 97 x 35.5		210 x 122 x 45	
Panel Cutout (W) x (H) mm		136 x 85		196 x 108	
Weight		240g		430g	
Safety Approval (Waterproof for front panel)		IP65/NEMA4 & CE, UL			

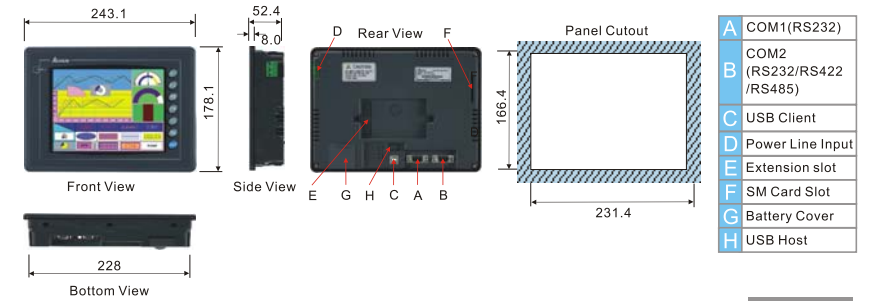
1) Only DOP-AE94BSTD is not UL recognized. The application is in progress.  
 2) The maximum visual performance of the 256 colors models is 256 colors. However, in order to make the created elements to be displayed with more brilliant colors, the Screen Editor (Screen Editor, the program editor of Delta HMI product) only provides 144 colors for user settings.  
 3) The user please use isolated power supply except DOP-AE80THTD, DOP-AE94BSTD, DOP-AE10THTD these models.  
 4) The user can download the Screen Editor, the program editor of Delta HMI product and the user manual via the following link: <http://www.delta.com.tw/industrialautomation/>.

## Dimensions

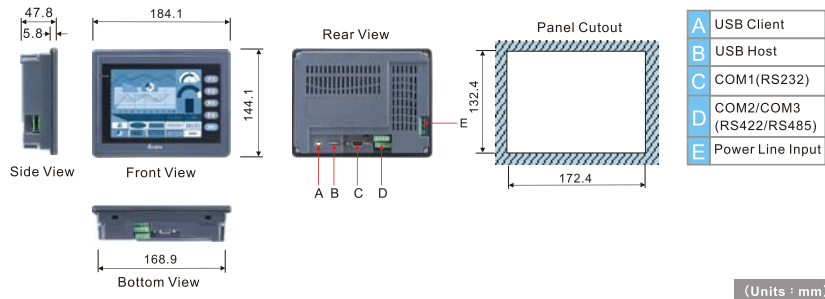
**DOP-AS38BSTD(-W)**



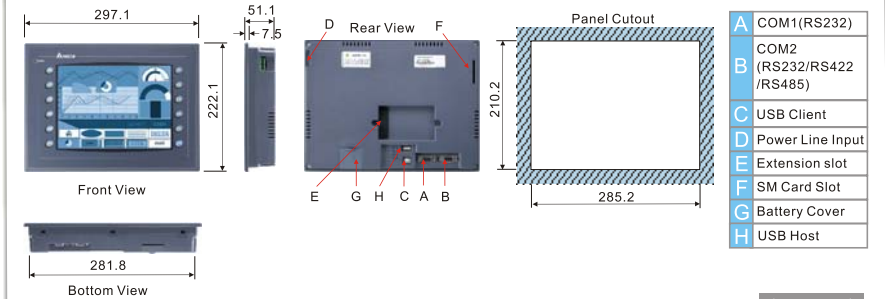
**DOP-AE80THTD/DOP-A80THTD1**



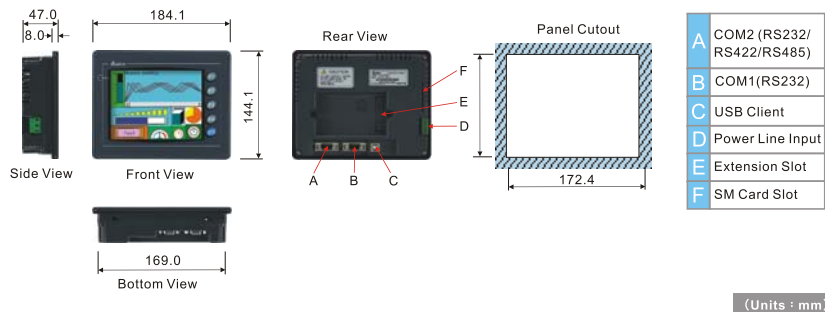
**DOP-AS57BSTD**



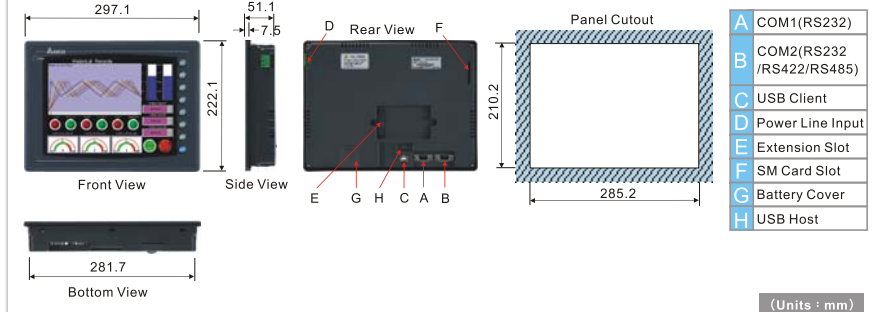
**DOP-AE94BSTD**



**DOP-A(E)57G(B)(C)STD(-W)**



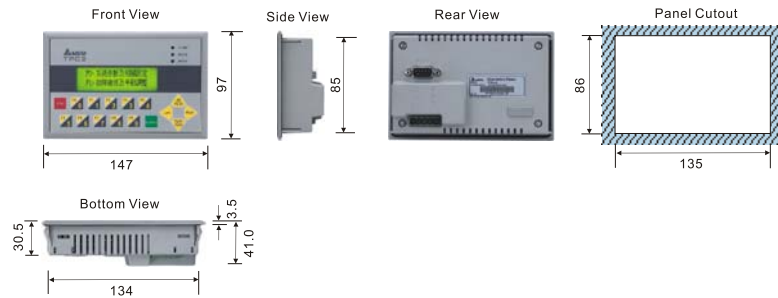
**DOP-A10TCTD/AE10THTD**



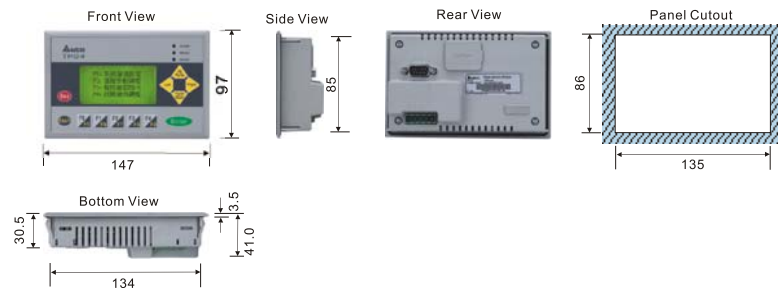


## Dimensions

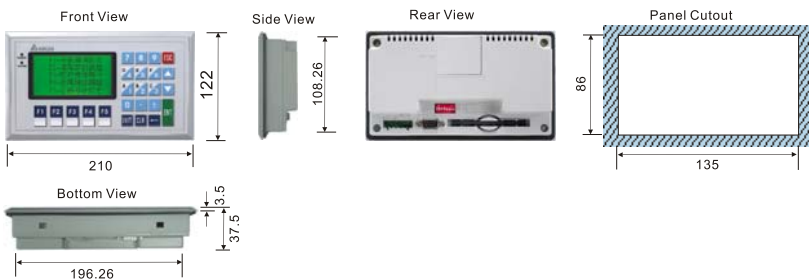
### TP02G-AS1



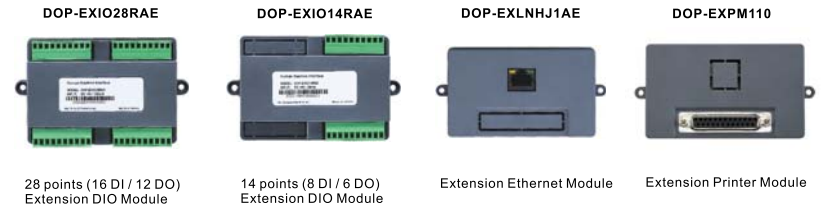
### TP04G-AS2



### TP05G-BS2/TP08G-BS2



### Extension Module



### Ordering Information

DOP - A 80 TH T D 1 -W  
 (1) (2) (3) (4) (5) (6) (7) (8)

(1) Product Name	DOP: Delta Operation Panel	
(2) Series	AS: Delta AS series HMI A: Delta A series HMI AE: Delta AE series HMI	
(3) Display Size	38: 3.8 inches 57: 5.7 inches 80: 8 inches 94: 9.4 inches 10: 10.4 inches	
(4) Display Type	BS: 8 Shades of Blue, GS: 16 Shades of Gray, CS: 256 colors, TC: 256 colors, TH: 65536 colors,	STN monochrome LCD FSTN monochrome LCD STN color LCD TFT color LCD TFT color LCD
(5) Control Interface	T: Touch Panel	
(6) Rated Voltage	D: DC+24V	
(7) Version Identification Code		
(8) Case Color	None: Gray W: White (Note 1)	
Note 1: Only the following models are provided with white case : A(E)57BSTD, A(E)57CSTD, A(E)57GSTD, AS38BSTD		

TP 02 G - AS 1  
 (1) (2) (3) (4) (5)

(1) Product Name	TP: Terminal Panel
(2) Display Line Number	02: 2 lines displaying model 04: 4 lines displaying model 05: 5 lines displaying model 08: 8 lines displaying model
(3) Display Type	G: Graphic mode
(4) Version	A: Without numeric keypad B: With numeric keypad
(5) COM Port	1: COM1 is for RS232 2: COM1 can be either RS232 or RS422