

MT080/084/104/121 Installation manual

MT series Touch Panel, such as MT080-VNT/ MT084-TNT/ MT104-VNT/ MT121-TNT, are expert HMIs with high functions and reasonable price answer to the needs for most of the automation equipments and systems. High coordination screen with plentiful colors relieve high speed and high quality. The industrial standard design let MT products meets harsh environment and work for long and steady.

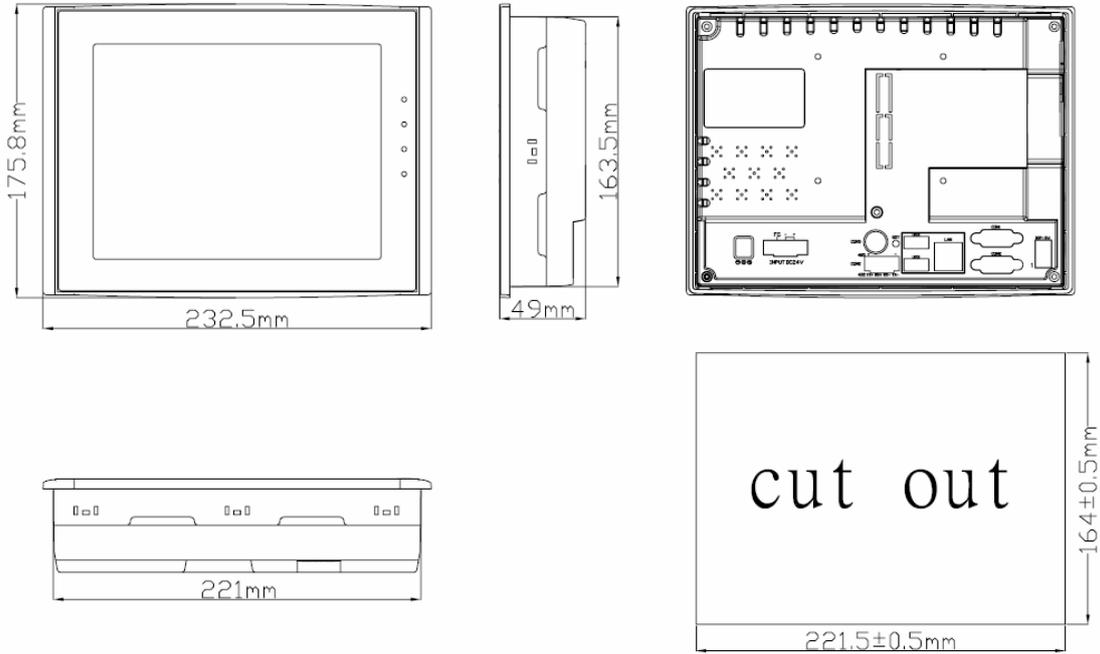
Apart from the basic functions other HMIs may have, it supports most PLC, inverter and temperature controller drivers on the market. Maxtech is laboring on the providing LAN function for standard models. The ultimate patent design front panel inspired customers to make their own HMI membrane styles. In addition to completely communication interfaces, flexible hardware design enables Ethernet TCP/IP operation. The modernistic outward, high brightness LCD with considerable memory let MT wins good reputations from users applying HMI in factory automation , wise buildings and special tool machines.

MT080/084/121 Specifications

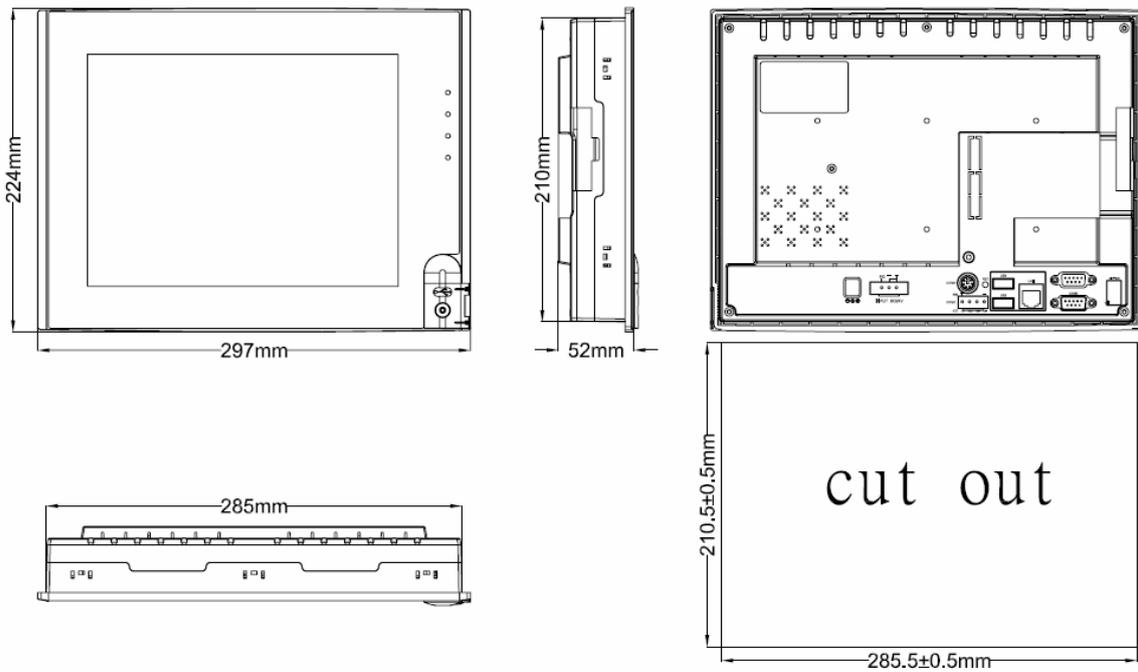
Items	MT080-VNT	MT084-TNT	MT104-VNT	MT121-TNT
Display Type	Color mode TFT LCD, 65536 colors			
Display Size	8.0" (diagonal)	8.4" (diagonal)	10.4" (diagonal)	12.1" (diagonal)
Number of Pixels	640X480	800X600	640X480	800X600
Display Adjustment	Contrast adjustable from touch screen			
Back Light	CCFL; Life time is 30,000 hours under 25°C and 85%RH humidity	CCFL; Life time is 50,000 hours under 25°C and 85%RH humidity		
Touch Screen	Analog resistive type; Max. Number of switches are 40x30 Chemically strengthened glass backing panel; Over 1 million point activations; Hard coat is resistant to most solvents and chemicals			
Input Power	24VDC±10%; Isolation; Under 30W			
CPU	RISC ARM9 32 Bit CPU			
Flash Memory	16M Bytes(up to 64M Bytes)			
System working Memory	64M Bytes			
Battery Backed Memory	128K(Up to 1024K Bytes)			
Communication Ports	COM1/9pin: RS232/RS422/RS485 COM2/9pin: RS232 COM2/Terminal 4Pin : RS422/RS485 COM3 RS232			
Ethernet Port	Yes			
USB	Host VER:1.1 X2			
ProfiBus Port	Optional with extension card			
Front Panel Seal	IP65 / NEMA 4			
Operating Temperature	0~50°C			
Storage Temperature	-20~60°C			
Ambient Humidity	20-90% RH (non-condensing)			
Vibration Endurance	0.5mm displacement, 10-55Hz, 2hours per X, Y, and Z-axis directions			
Shock Endurance	10G, 11ms three times in each direction of X, Y, and Z axes			
RFI testing	FCC Part15 Class A			
Radiated Disturbance Test	EN 55022/1998+A1:2000			
Electrostatic Discharge Test	EN61000-4-2/1995+A1:1998			
RF Electromagnetic Field Test	EN61000-4-3/1996+A1:1998			
Surge Immunity Test	EN61000-4-5/1995			
EMC Test Report	EN55022/EN55024/EN61000-3-2,3/EN61000-4-2,3,4,5,6,8,115			
Net Weight	0.9Kg	0.9Kg	1.4Kg	2.2Kg
Cooling	Natural cooling			

Outlet and Cut out dimensions

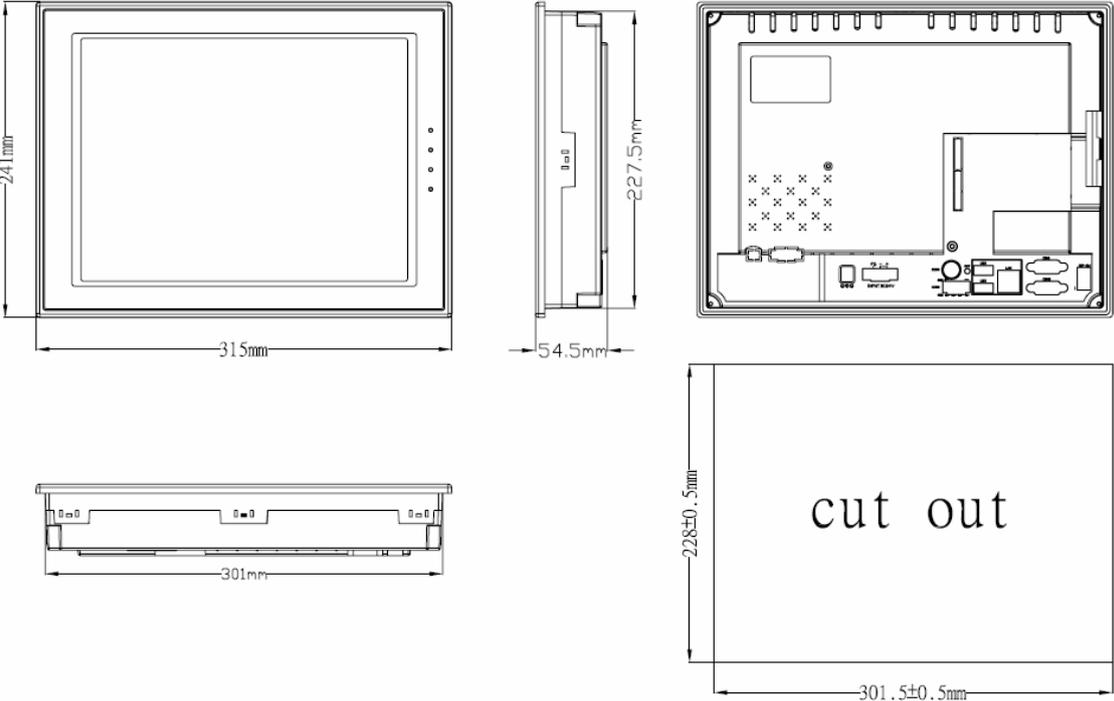
The outlet and cut out dimensions of MT080-VNT/MT084-TNT are shown as following.



The outlet and cut out dimensions of MT104-VNT are shown as following.



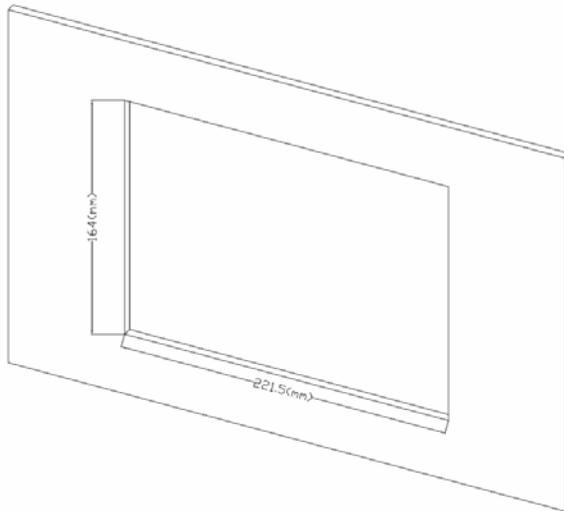
The outlet and cut out dimensions of MT121-TNT are shown as following.



Installation

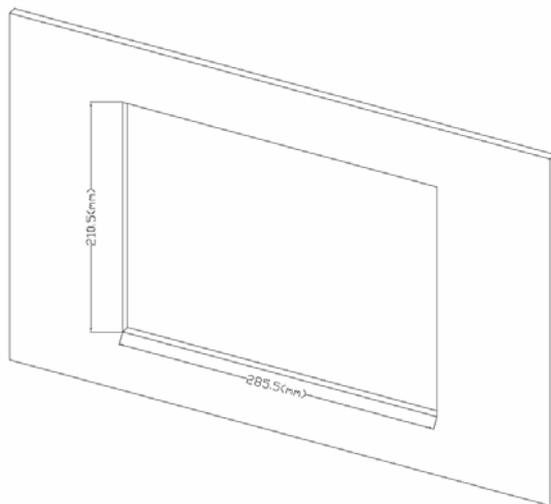
Before setup HMI, please cut a hole according to the cutout dimension.

See below pictures for your installation reference.

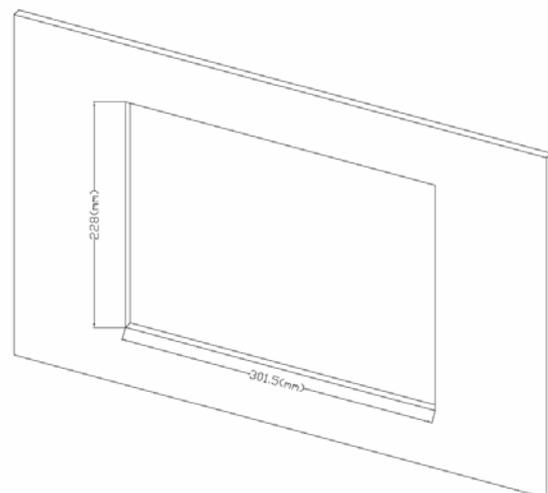


MT080-VNT
221.5mmx164.0mm

MT084-TNT
221.5mmx164.0mm



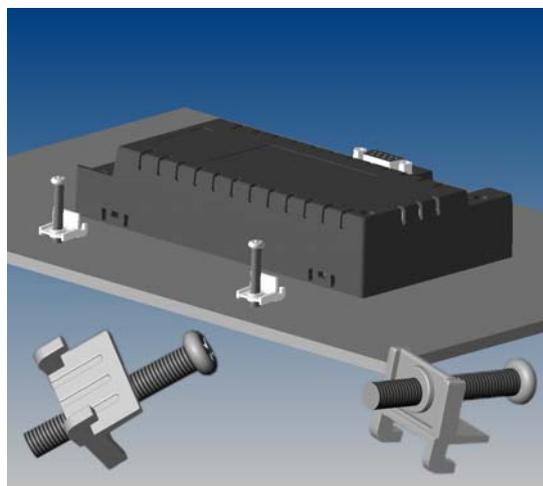
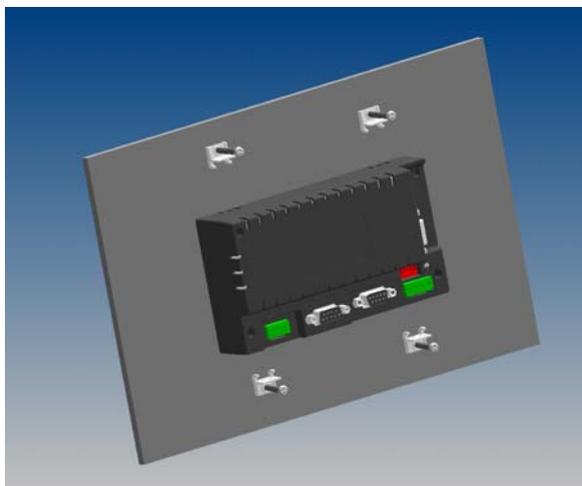
MT104-VNT
285.5mmx210.5mm



MT121-TNT
301.5mmx228.0mm

How to install the HMI?

Put the HMI to the cut hole and sew the lock screws at the four assembling holes on the HMI with average strength form the rear side. Please do not sew too tight and without equational strength or it will damage the touch panel.



The operation of the Touch Panel

MT080/104 is a kind of touch panel equipped with a VGA, 640(H) x 480(V) size LCD display and an analog input touch panel. The screen is a 40 x 30 chemically strengthened glass switches backing panel. The shapes of touch keys should be rectangles with sizes from minimum 8(H) x 8(V) pixels to maximum 640(H) x 480(V) pixels.

MT084/121 is a kind of touch panel equipped with a super VGA, 800(H) x 600(V) size LCD display and an analog input touch panel. The screen is a 40 x 30 chemically strengthened glass switches backing panel. The shapes of touch keys should be rectangles with sizes from minimum 8(H) x 8(V) pixels to maximum 800(H) x 600(V) pixels.

FEATURES

1. Portrait 90° display & normal horizontal display supported
2. 100% quality test and industrial standard coating cases.
3. Adopts 32 bits high function; high reliability and fan-less ARM CPU
4. Equipped with genuine 65535 true colors, high brightness TFT modules
5. Provides 3 RS232/422/485 communication ports available in standard models
6. The standard 128KB backup memory, which can expand up to 1MB, allows storing Alarm, Recipe and historical data
7. Supports multi-languages, Windows build-in Fonts, BMP and JPG graphics and GIF animations
8. Provides transparent communication for designers to save their program adjustment time
9. The ultimate patent front panel design inspired customers to make their own HMI membrane styles.
10. The expansion bus expands various customize devices, such as motion control, temperature control, communication module and I/O module...etc.
11. High speed Ethernet port supports upload and download remote communication.
12. Provides accommodative Software, "**PanelMaster**".

ADVANTAGE FUNCTIONS

MT080/084/104/121 are all compact HMIs with BIOS password protected function. This special function can be used to prevent the inside application data from being stolen or destroyed. The BIOS password is not set as a default situation.

With BIOS upgrade function, wherever in the world, whenever the HMI needs to be updated new functions, this function supports upgrading without sending back to the factory.

With serial number in the BIOS as an ID number of the HMI Supports checking the serial number from the HMI to assure a complete after service.

The unique 2 BIOS systems patent design. In our past experiences, the HMI will not be able to run normally or even not be turned on the system due to the unstable electricity during operating. With the two BIOS system, customers need not send the damaged HMI back to the factory.

Customize logos and User ID codes are available. Even for the small amount industrial products, this function let the customers have their own operating panel to complete an integer design.

Automatically data download and communication ports COM1; COM2 detection. No need to setup.

With BIOS recovery system while missing password can prevent system blocking due to missing password.

DIP Switches setting

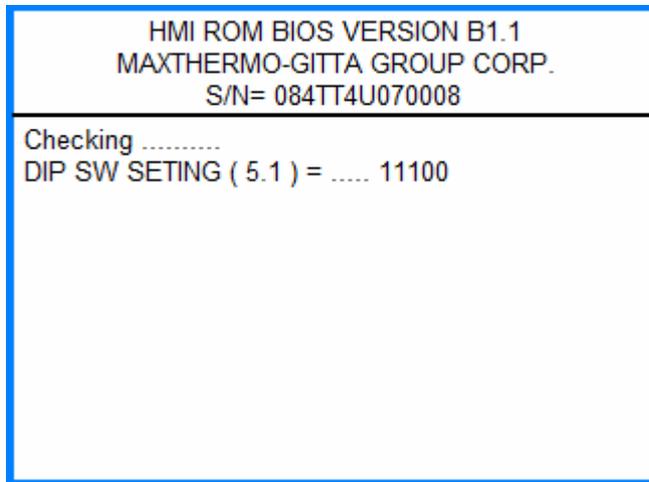
MT080/MT084/MT104/MT121 DIP Switches setting

SW1		System Menu
ON		Not display system menu, go to ON-LINE communication after turns on.
OFF		Display system menu when turns on. Not go to ON-LINE communication.
SW2		Emergency recovery the HMI BIOS to default value.
ON		Set to default OS version or customized OS version.
OFF		Set to default BIOS version B.
SW3	SW4	HMI operation mode (Supports special functions for customized BIOS version)
OFF	OFF	Reserved
ON	OFF	To execute HMI Communication testing program (SW1,2 must set to Off)
OFF	ON	To execute Key adjustment program or Touch adjustment program (SW1,2 must set to Off)
ON	ON	To execute HMI application program
SW5		Reserved
ON		Reserved
OFF		Reserved
SW6		Extension Module & Com3 port Selection
ON		Com3 Port enable
OFF		Extension Module Enable

***The MT080/084/104/121 has a BIOS password recovery system to prevent damage when missing password. When you forget the password, which has been set to the HMI, this HMI can execute RUN AP/Calibrate operation but cannot execute BIOS/Download AP/Clear SRAM operations. When the users want to download new AP without password, please set all DIP switches to off (SW1-6=Off), When turns on HMI again, the HMI will display the clean all AP and old password screen. After proceeding this procedure, the HMI can be operated normally again.

Startup Test

When turns on HMI, it will display self-testing screen. After completed, HMI will show the system menu.



FigureA-1 The HMI startup self-testing _normal

**When turns on HMI, system will automatically execute hardware testing first to make sure hardware are normal or not. The result will show on the screen (Figure A-1). If there are problems, the HMI will not communicate with P.L.C. normally.

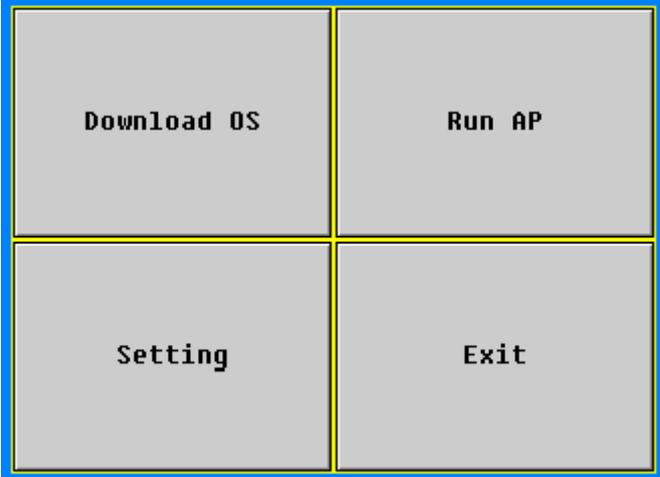
When losing electricity during downloading or the PC breaks off downloading, after restarting the HMI, it will show Firmware Memory Checksum and Application Memory Checksum error. It means there is an abnormal downloading. To get a correct self-testing result, please execute a correct download AP procedure again.

If losing electricity during downloading or the PC breaks off downloading when upgrading OS, it will surely cause download failure. If you restart the HMI, it will not display normal screens or even cannot be turned on. In that case, please set the DIP SW2 to OFF, restart the HMI to get a default BIOS version B then execute the upgrading OS program to get a correct OS version. Set the DIP SW2 to ON then the HMI can be turned on normally.

Startup Menu

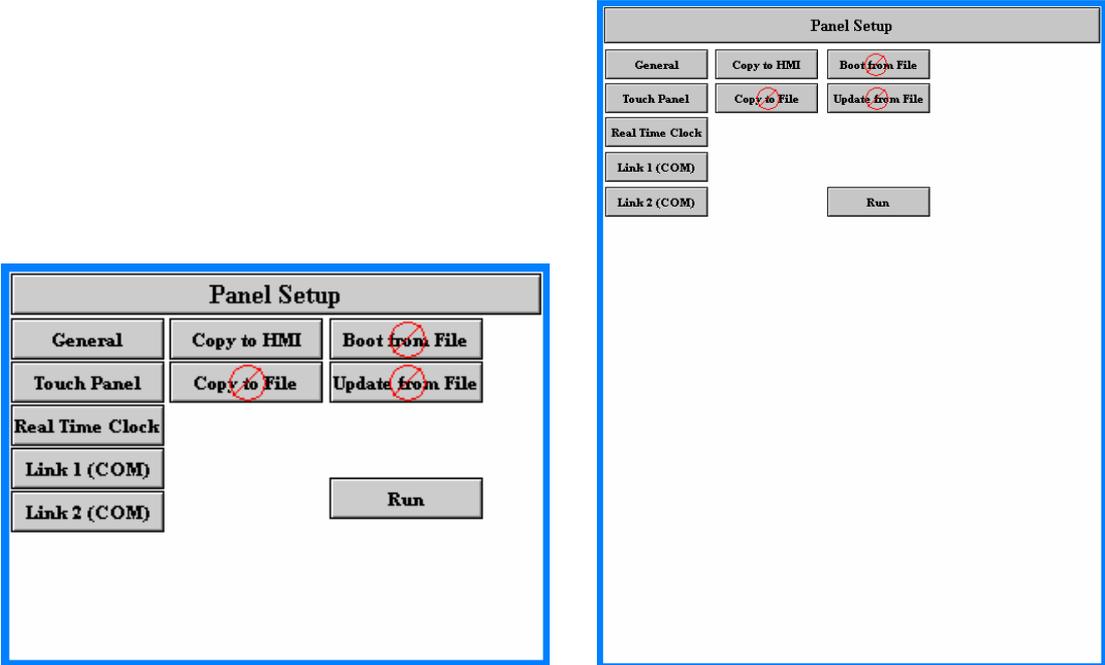
If the DIP SW1 set to off, after self-testing the MT080/084/104/121 will show startup menu as following figures.

Situation 1: When SW2=OFF, it will show the default startup BIOS.



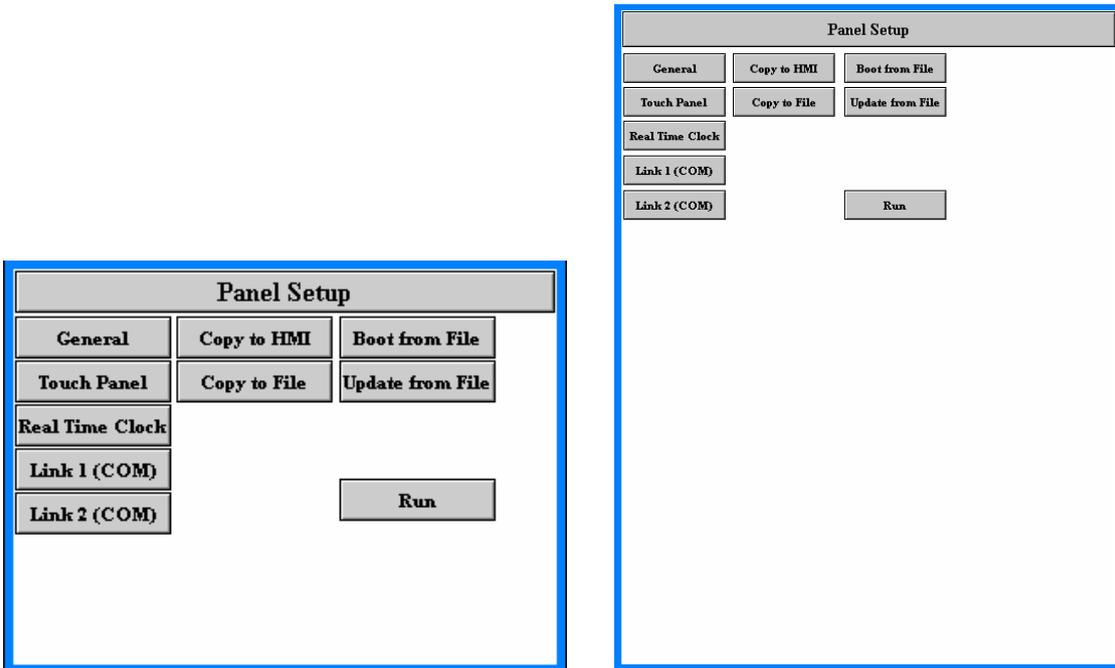
FigureA-2 Startup BIOS_Default

Situation 2: When SW2=ON, it will show the Panel Setup screen.



FigureA-3 Panel Setup_ Remove the USB Sticker (Horizontal & Vertical)

Situation 3 : When SW2=ON and there is an USB sticker insert to rear USB port, it will show the Panel Setup screen.



FigureA-4 Panel Setup_ Insert the USB Sticker (Horizontal & Vertical)

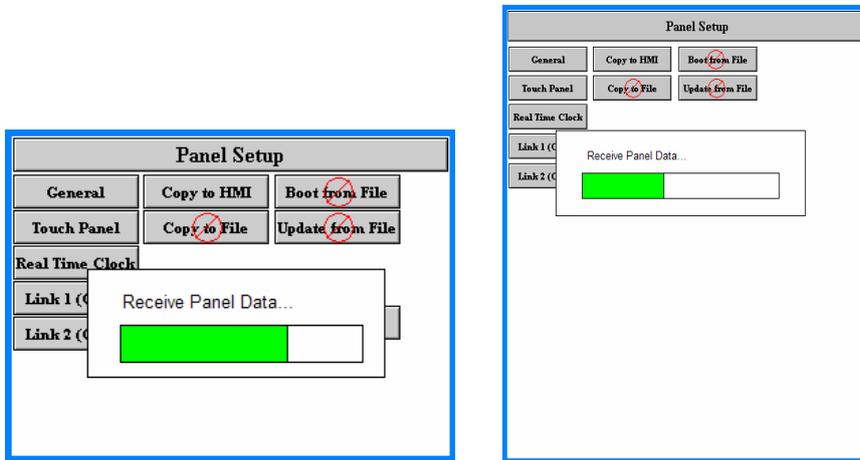
System menu	Descriptions	Password
Download OS	To receive new AP OS Ver. from COM Port.	Yes*1
Copy to HMI	To Copy AP to another HMI from COM1/2.	Yes*1
Run AP	Press “Run AP” or “ENT” to communicate with P.L.C..	None*2
Setting	HMI keys and hardware functions testing.	None
LCD Test	Check HMI LCD Display	None
Clock Setting	HMI Time & Date Setting	None
Ethernet Setting	Ethernet IP Address Setting	None
Memory Checking	Check HMI memory size	None
Exit	Press “ESC” to return HMI hardware self testing	None

*1.If sets a BIOS protection password to HMI, then the HMI will request the users to enter BIOS password.

*2. If sets a login user password in AP, when selects Run AP, it will request the user to enter BIOS password.

Download AP

To download AP to HMI, please make sure the download cable is connected properly. During the operating or in startup menu the HMI is ready to receive AP data sent by PC automatically. When download AP the SW2=ON.



FigureA-5 The HMI downloading data from PC screens

1. Connect the PC COM1 or Com2 and HMI with a PC download cable.

HMI Connector 9-pin Female	PC RS232C 9-pin Female	HMI Connector 9-pin Male	PC Connector 9-pin Female
RXD 2	3 TXD	RXD 2	3 TXD
TXD 3	2 RXD	TXD 3	2 RXD
SG 5	5 SG	SG 5	5 SG
CTS 8	7 RTS	CTS 8	7 RTS
RTS 7	8 CTS	RTS 7	8 CTS
HMI COM2 ---- PC COM		HMI COM1 ----- PC COM	

Serious Caution: Be sure turn off the power before connecting or it will damage the HMI communication components.

2. The HMI will judge the data correctness during downloading AP.

When the PC sends AP data to HMI, the HMI will show download AP screen and display related information automatically to receive data. The HMI will show "Incorrect Model !" when the Model No. is not set correctly in the AP data. Please select a correct Model No. from the software then download it again. If the HMI shows "Incorrect User ID Code !", then the hardware and software might not fit each other. Please check the brand name of the HMI to make sure you purchased a right hardware.

COM Ports Define

The communication port COM1 of MT080/084/104/121 can use as RS232C、RS422 and RS485. The COM2 of MT080/084/104/121 can use as RS232, RS422 and RS485. Please make the right connecting cable according to the specifications. About the cable connecting figures of the HMI to other P.L.C., please refer to the P.L.C. manuals.

Communication port COM1 in HMI is a DB-9P Female.

COM1 : pin definitions

Pin	Function	Pin	Function
1	RS-422 TX+ and RS-485 +	6	RS-422 TX- and RS-485 -
2	RS-232 RXD	7	RS-232 RTS
3	RS-232 TXD	8	RS-232 CTS
4	RS-422 RX+	9	RS-422 RX-
5	Signal ground		

Communication port COM2 in HMI is a DB-9P Male.

COM2 : pin definitions

Pin	Function	Pin	Function
1	RS-485 +	6	RS-485 -
2	RS-232 RXD	7	RS-232 RTS
3	RS-232 TXD	8	RS-232 CTS
4		9	Optional 5V output
5	Signal ground		

COM2 : 4-pin definitions.

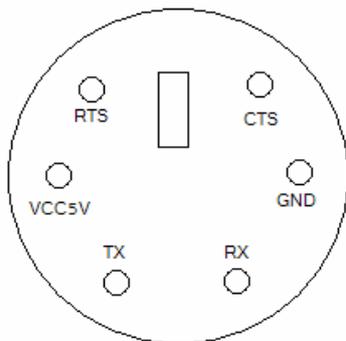
RS422 and RS485 ◦

422 TX+ RX+ RX- TX-



485 + -

Communication port COM3 in HMI is a Round-6P Female for RS232 use only.



Com3 Pin Configuration

LCD Adjustment and IP Address Setting

To adjust the LCD brightness, (TFT model can not be adjusted the brightness), press [General] from MT Panel Setup screen or press [LCD Testing] from [Settings] in BIOS B. From [LCD Brightness], press [Increase Brightness] to increase the brightness, press [Decrease Brightness] to decrease brightness, press [Save Brightness] to save. Press [OK] to return to system screen.

When you wish to use the Ethernet, please press [General] from MT Panel Setup screen and then you can set the IP Address. You can press the IP Address number and use [+] & [-] button to increase or decrease the IP Address number.

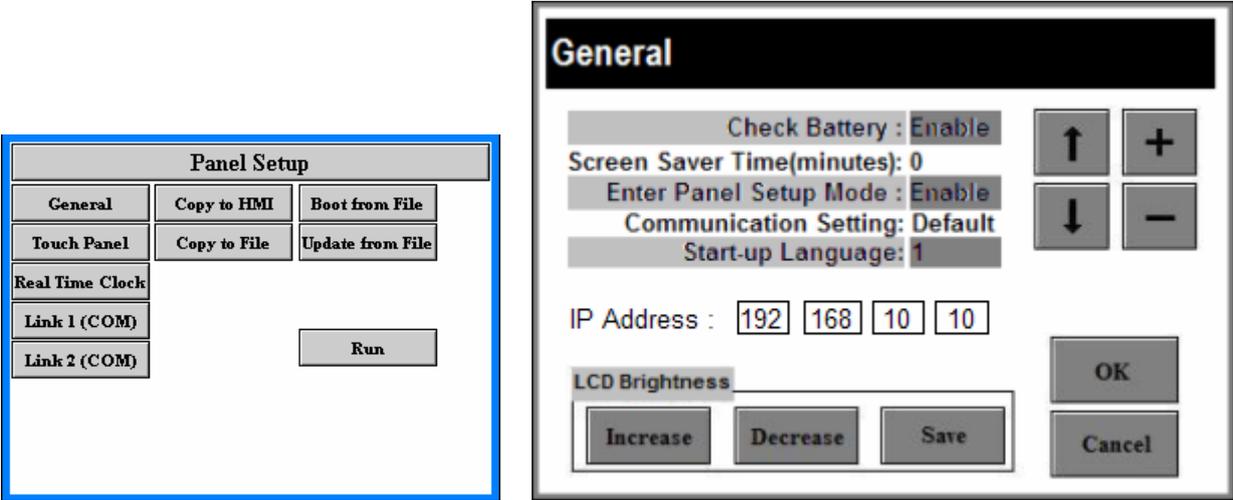


Figure A-6 Panel Setup screen_ LCD brightness adjustment & IP Address Setting

Power and Grounding Specifications

Use DC24V as MT080/084/104/121 power input. The power consumptions are as following table. To ensure the MT080/084/104/121 hardware working properly, to avoid outside electromagnetism noise, please ground the power source properly.

Items / Models	MT080-VNT	MT084-TNT	MT104-VNT	MT121-TNT
Power consumption	24VDC±10%; 20W			
Fuse Rating	0.8A			

Power grounding caution: The products are all equipped with power terminals and lock assembling sets. The operating procedure is:

- 1 · Screw off the power terminal.
- 2 · Peel the 24V wiring(1.25mm) for 1 cm then plug in the power terminal.
- 3 · Use line screw driver to screw the power terminal tight.

Package content

We are appreciated for your purchasing our products. Our standard package should be equipped with 5 items as following. Please check after receiving it. If there's any shortage, please refer to the suppliers.

MT080/MT084/MT104/MT121 unit x 1 (HMI Hardware)

Power terminal x 1 (power terminal)

Communication terminal x 1 (4-pin communication connector)

MT080/ MT084: Installation screw nuts x 4 (Lock for assemble with screws)

MT104/ MT121: Installation screw nuts x 8 (Lock for assemble with screws)

MT080/ MT084/ MT104/ MT121 Installation Guide x 1 (Installation manual)

Cautions

If this product is used in a house, radio-wave interference might occur to other devices. In the case that it does occur, the user is requested to try a variety of remedies to solve the problem.

Power source

- ◆ MT080/084/104/121 is equipped with DC24V input power. If the supply power is other than DC24V, whatever less or excess, it will severely damage the HMI. Therefore, check the switching power supply supporting the DC power regularly.
- ◆ To avoid electronic shock, be sure the Power Cable is unplugged from the power outlet when connecting the cable to the HMI.

Grounding

- ◆ From the FG terminal at the rear side of HMI, please make sure the grounding is made exclusively.
- ◆ When the FG terminal is connect, be sure the wire is grounded. Without grounding, the operation of HMI may be severely affected by excess external noise levels and vibrations.
- ◆ Use a cable at 2 mm² (AWG 14) to ground the equipment. Ground resistance must be less than 100Ω (class3). Note that the ground cable must not be connected to the same ground point as the power circuit.

Installation

Mount the HMI from the front of a suitable preserved hole.

- ◆ Attached the brackets behind.
- ◆ Fasten the screw of the brackets with proper force. Tightening too much may cause damage to the structure of the unit.
- ◆ Input and Output signal lines must be separated from the power cables for operational circuits. Use shielded cables or it may cause unpredictable problems.
- ◆ Do not allow cut wires, filling, or shavings to fall inside a unit or block when drilling holes or connecting cables/lines.

Environment

- ◆ Do not install in areas subject to excessive dust, oily mist, conductive dust, corrosive gas, or flammable gas.
- ◆ Do not mount in areas subject to shock or vibration.
- ◆ Do not mount in areas subject to high temperature, moisture, or rain.



Indicated loss of life, severe personal injury, or substantial property damage will result if proper precautions are not taken.

Remark :

Maxtech Human Machine Interface : MT-080-VNT and MT-508-TV			2007.1.10
NO	Product Information	" New " MT-080-VNT	MT-508-TV
1	CPU	RISC 32 Bits CPU	Intel PXA255
2	Display	8" TFT , 65535 colors	8" TFT , 256 colors
3	Brightness	350 cd/m ² ~450 cd/m ²	400 cd/m ²
4	Backlight	CCFL(U type)x1	CCFLx1
5	Backlight life time	50000hrs (Under normal temperature)	40000hrs (Under normal temperature)
6	Resolution	640X480 (8" diagonal)	640X480 (8" diagonal)
7	Flash Memory	16 MB ~ 64MB (Optional) flash memory	2MB flash memory
8	Battery Backup	128 KB ~ 1 MB (Optional)	128 KB
9	Communication Port	1 RS-232 (HMI-PC or HMI-PLC) 1 RS232/422/485 (HMI-PLC) 1 RS232/422/485 (HMI-PLC)	1 RS-232 (HMI-PC) 1 RS232/485 (HMI-PLC) 1 Printer Port
10	Extension Port	(Optional : Profibus Module)	none
11	USB Port	2 USB Host Ver.2.0 Full Speed Ports	none
12	Ethernet	10/100 Ethernet Port	(Optional)
13	Dimension	HxWxD:176x233x50mm	HxWxD:231x176x55mm
14	Graphics	BMP / JPG / GIF	BMP
15	Weight	Approx: 0.9 kg	Approx:1.2 kg
16	EMI	Complies with FCC class A	Complies with FCC class A
17	CE Approved	Yes	Yes
18	Operating temperature	0° ~ 50°C (32° ~ 120°F)	0° ~ 45°C (32° ~ 113°F)
19	Front Panel Meets	NEMA4 / IP65	NEMA4 / IP65
20	Relative humidity	10% ~ 90% RH @ 50°C, non-condensing	10% ~ 90% RH @ 40°C, non-condensing
21	Software	Panel Master	Easy Builder

Remark :

Maxtech Human Machine Interface : MT-104-VNT and MT-510-T

2007.1.10

NO	Product Information	“ New “ MT-104-VNT	MT-510-T
1	CPU	RISC 32 Bits CPU	RISC 32 Bits CPU
2	Display	10.4" TFT , 65535 colors	10.4" TFT , 256 colors
3	Brightness	350 cd/m ² ~450 cd/m ²	400 cd/m ²
4	Backlight	CCFLx2	CCFLx2
5	Backlight life time	50000hrs (Under normal temperature)	50000hrs (Under normal temperature)
6	Resolution	640X480 (10.4" diagonal)	640X480 (10.4" diagonal)
7	Flash Memory	16 MB ~ 64MB (Optional) flash memory	2MB flash memory
8	Battery Backup	128 KB ~ 1 MB (Optional)	128 KB
9	Communication Port	1 RS-232 (HMI-PC or HMI-PLC) 1 RS232/422/485 (HMI-PLC) 1 RS232/422/485 (HMI-PLC)	1 RS-232 (HMI-PC) 1 RS232/485 (HMI-PLC)
10	Extension Port	(Optional : Profibus Module)	none
11	USB Port	2 USB Host Ver.2.0 Full Speed Ports	none
12	Ethernet	10/100 Ethernet Port	(Optional)
13	Dimension	HxWxD:224x297x52mm	HxWxD:315x238x62mm
14	Graphics	BMP / JPG / GIF	BMP
15	Weight	Approx:1.4 kg	Approx: 2.0 kg
16	EMI	Complies with FCC class A	Complies with FCC class A
17	CE Approved	Yes	Yes
18	Operating temperature	0° ~ 50°C (32° ~ 120°F)	0° ~ 45°C (32° ~ 113°F)
19	Front Panel Meets	NEMA4 / IP65	NEMA4 / IP65
20	Relative humidity	10% ~ 90% RH @ 50°C, non-condensing	10% ~ 90% RH @ 40°C, non-condensing
21	Software	Panel Master	Easy Builder