

MT035/MT037/MT057/MT058 Installation manual

Among the automation control devices, MT series is a high function but cost effective Panel. Besides most basic functions, it supports drivers of most PLCs, invertors and temperature controllers on the market. It is not only equipped with standard compact plastic case, but also provides customized key types for users to design their favorite ones. MT satisfies many kinds of design, such as emergency buttons with various buttons. Thus, MT series can concur harsh environments to meet customers' needs and welcome by tool machines, specified function machine designers.

MT035 Specifications

Items	MT035-TST	MT035-TNT
Display Type	Color mode TFT LCD, 256 colors	Color mode TFT LCD, 256 colors
Display Size	3.5" (diagonal)	
Number of Pixels	320X240	
Display Adjustment	Contrast adjustable with VR from the rear side	
Back Light	LED; Life time is 100,000 hours	
Touch Screen	Yes	Yes
Switch Key	X	X
Input Power	24VDC \pm 10%; Isolation; Under 5W	
CPU	RISC ARM 32Bit CPU	
Flash Memory	4M Bytes	4M Bytes
System working Memory	1M Bytes	2M Bytes
Battery Backed Memory	128K Bytes(Standard) ~1M Bytes	
Communication Ports	COM1/9pin Female: RS232/RS422/RS485; COM2; 4pin Plug Connector RS422/RS485	
Ethernet Port	X	Yes
Extension Bus Port	X	X
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, 30Min. 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	0.3Kg	0.3Kg
Cooling	Natural cooling	

MT037 Specifications

Items	MT037-LSK	MT037-LST	MT037-LNT
Display Type	Monochrome blue mode STN LCD, 16 gray levels		
Display Size	3.7" (diagonal)		
Number of Pixels	160x80		
Display Adjustment	Contrast adjustable with VR from the rear side		
Back Light	LED; Life time is 50,000 hours		
Touch Screen	X	Yes	Yes
Switch Key	Number of switches are 22 keys	X	X
Input Power	24VDC \pm 10%; Isolation; Under 5W		
CPU	RISC ARM 32Bit CPU		
Flash Memory	1M Bytes		2M Bytes
System working Memory	256K Bytes		512K Bytes
Battery Backed Memory	Optional (from 128K Bytes~1M Bytes)		128K Bytes (Standard) ~1M Bytes
Communication Ports	COM1/9pin Female: RS232/RS422/RS485; COM2; 4pin Plug Connector RS422/RS485		
Ethernet Port	X	X	Yes
Extension Bus Port	Profibus (Options)	X	X
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, 30Min. 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	0.30 Kg	0.32	0.32
Cooling	Natural cooling		

MT057 Specifications

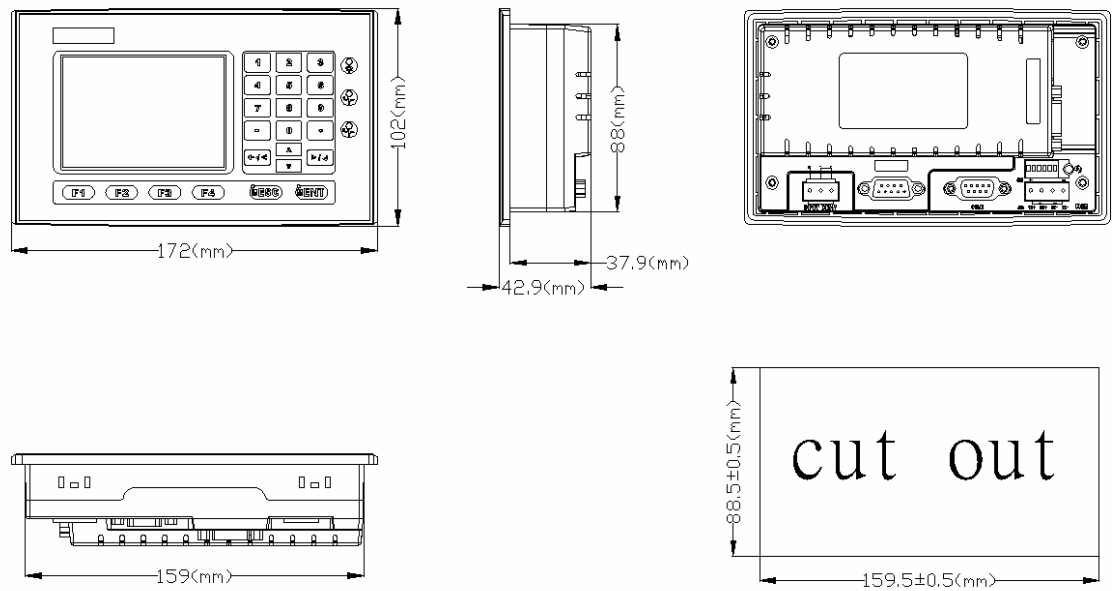
Items	MT057-LST	MT057-BST	MT057-TST
Display Type	Monochrome blue mode STN LCD, 16 gray levels		Color mode TFT LCD, 256 colors
Display Size	5.7" (diagonal)		5.6" (diagonal)
Number of Pixels	320x240		320x234
Display Adjustment	Contrast adjustable from touch screen		
Back Light	LED; Life time is 50,000 hours	CCFT; Life time is 20,000 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 10W		
CPU	RISC ARM 32Bit CPU		
Flash Memory	4M Bytes		
System working Memory	1M Bytes		
Battery Backed Memory	128K(Standard)~1M Bytes		
Communication Ports	COM1/9pin: RS232/RS422/RS485 COM2/9pin: RS232 COM2/Terminal 4Pin : RS422/RS485		
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	0.85 Kg		
Cooling	Natural cooling		

MT058/MT058 Specifications

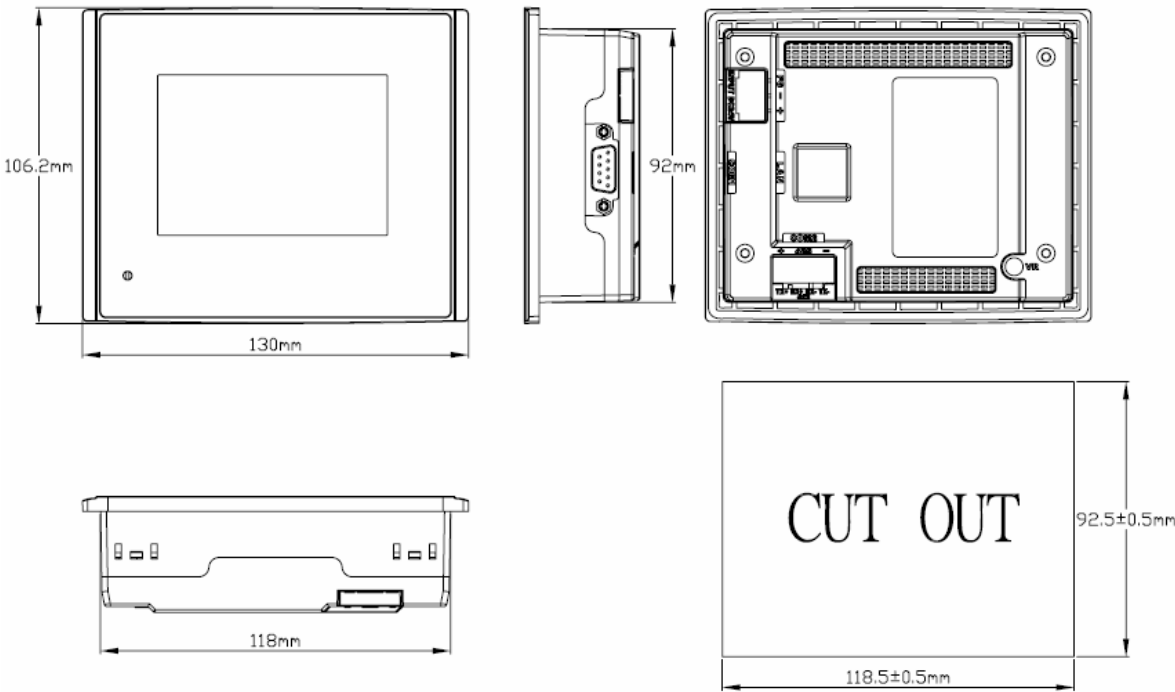
Items	MT058-TST	MT058-TNT
Display Type	Color mode TFT LCD, 256 colors	
Display Size	5.7" (diagonal)	
Number of Pixels	320x240	
Display Adjustment	Contrast adjustable from touch screen	
Back Light	LED; Life time is 50,000 hours	
Touch Screen	Analog resistive type; Max. Number of switches are 40x30 Chemically strengthened glass backing panel; Over 1 million point activations; Hard coat is resistant to most solvents and chemicals	
Input Power	24VDC \pm 10%; Isolation; Under 10W	
CPU	RISC ARM 32Bit CPU	
Flash Memory	4M Bytes	
System working Memory	1M Bytes	2M Bytes
Battery Backed Memory	128K(Standard)~1M Bytes	
Communication Ports	COM1/9pin: RS232/RS422/RS485 . COM2/9pin: RS232 . COM2/Terminal 4Pin : RS422/RS485	
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	0.85 Kg	
Cooling	Natural cooling	

Outlet and Cut out dimensions

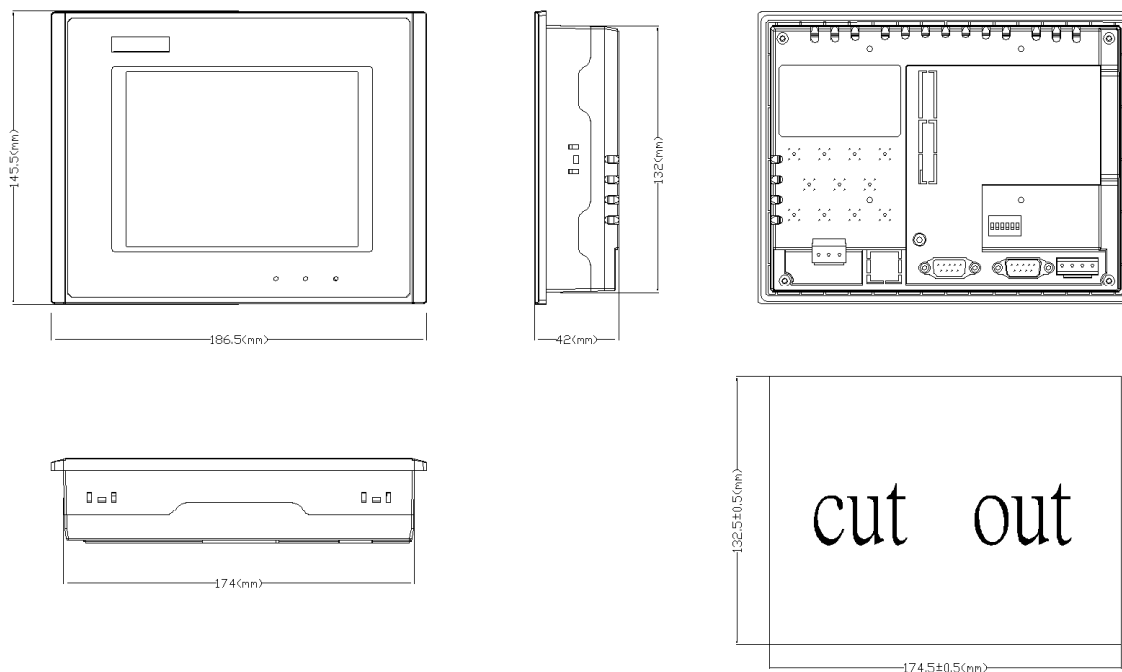
The outlet and cut out dimensions of MT037-LSK are shown as following.



The outlet and cut out dimensions of MT037-LST/LNT & MT035-TST/TNT are shown as following.



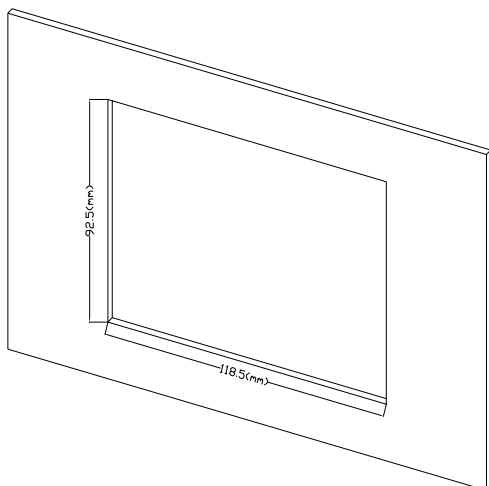
The outlet and cut out dimensions of MT057-LST/BST/TST & MT058-TST/TNT are shown as following.



Installation

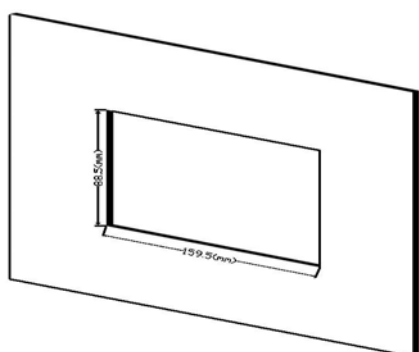
Before setup HMI, please cut a hole according to the cutout dimension.

Please see below pictures for your installation reference.



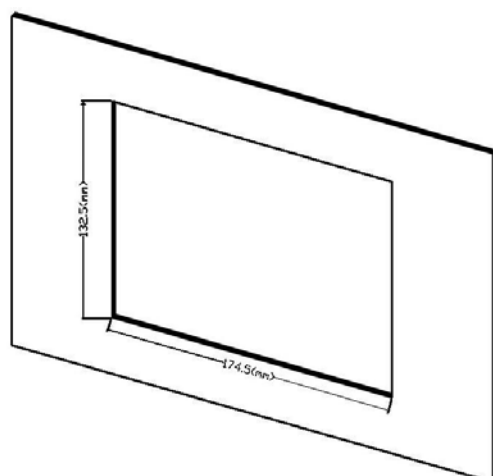
MT035-TST
118.5mmx92.5mm

MT037-LST
118.5mmx92.5mm



MT037-LSK
159.5mmx88.5mm

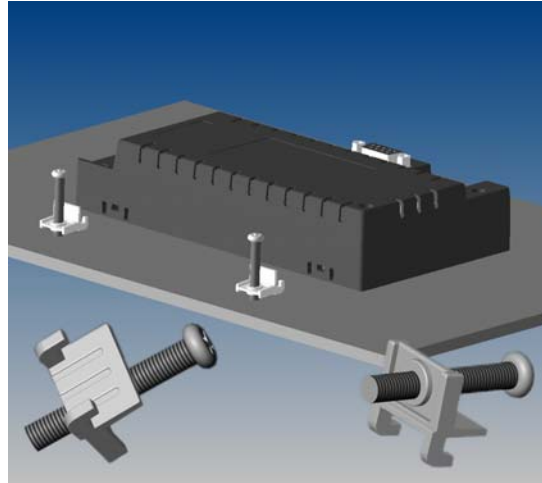
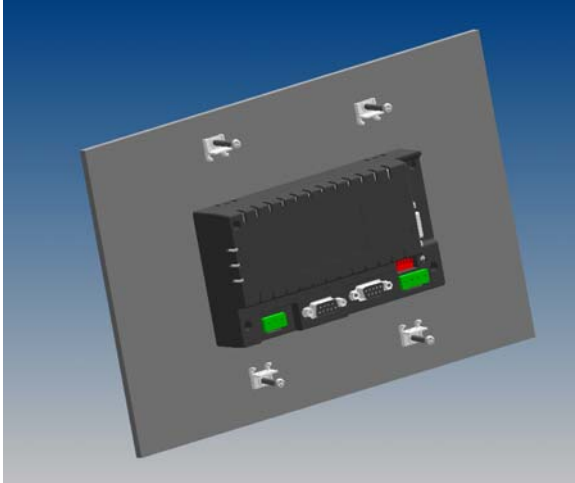
MT 037V-LSK
88.5mmx159.5mm



MT 057-LST
MT 057-BST
MT 057-TST
MT 058-TST/TNT
174.5mmx132.5mm

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 from the rear side. Please do not sew too tight and without equational strength or it will damage the touch panel.



The operation of the Key Panel and Touch Panel

MT037-LSK, a kind of key panel equipped with a 3.7" 160(H) x80(V) resolution LCD display, a 22 keys membrane, allows users to design various applications. If the touch panel is not fixed in a right position, set the DIP-SW1, SW2 and SW3 to off to execute the touch panel adjustment. Please adjust it while needed and do not do the unnecessary adjustment.

The Key panel MT037-LSK, is equipped with 22 keys on the membrane. Those keys are some for numeric entry and some for programmable function keys. There are four function keys, which can be assigned with various functions in any screen from the software. The other 0-9 ten keys on the membrane provide numerical entering function. They can also be locked temporarily. Press ESC and ENT at the same time to lock the ten keys. To unlock, press ESC and ENT again. For double-key's application, users can operate to press together ESC and F1~F4 to act as a programmable function keys. The Panel will automatically judge the data format or up/down settings to complete the data input.

MT035-TST/MT037-LST, a kind of touch panel equipped with a 3.5" 320(H) x240(V) or 3.7" 160(H) x80(V) resolution LCD display, an analog input touch panel, allows users to design various applications. If the touch panel is not fixed in a right position, press the touch panel glass while power on and entry BIOS screen. You can select "Touch Panel" option to execute the touch panel adjustment function. Please adjust it while needed and do not do the unnecessary adjustment.

MT057/MT058 is a kind of touch panel equipped with a 5.7", 320(H)x240(V) size LCD display and an analog input touch panel. It accepts to have maximum 40x30 touch buttons in a screen. The shapes of touch keys should be rectangles with sizes from minimum 8(H) x8(V) pixels to maximum 320(H) x240(V) pixels.

Features

1. High Quality Control and 100% Product Test.
2. Provides customized option keys design, 34pin Connector, 8x4=32 matrix keys and 8 individual function keys. There are 40 keys in total.
3. Built-in Finless, Reliable and High Function RISC 32-bits CPU.
4. Provides long life LED backlight / Color TFT LCD.
5. Provides 128KB ~1 MB battery backup memory for Alarm 、Recipe 、Data Recording Using.(Options)
6. Supports Multi-Languages 、Unicode & BMP 、JPG 、GIF graphic formats.
7. Provides accommodative Software, “**PanelMaster**”.
8. Customize Logo / Membrane Design and BIOS for users.

MT037/MT057/MT058 is a compact HMI 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 two BIOS system 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.

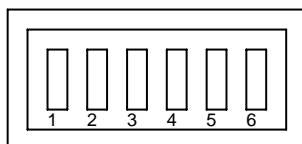
Automatically data download and communication port COM1 or COM2 detection. No need to setup.

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

DIP switches setting

MT037-LSK/MT057/MT058 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		HMI operation mode (Supports special functions for customized BIOS version)
OFF	OFF	
ON	OFF	
OFF	ON	
ON	ON	
SW5		Reserved
ON		Reserved
OFF		Reserved
SW6		Reserved
ON		Reserved
OFF		Reserved

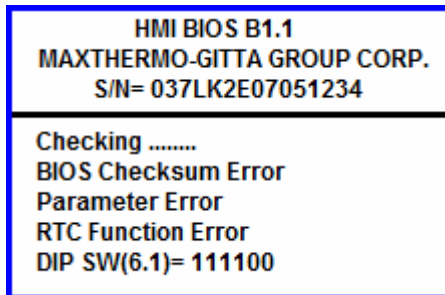


***The MT037/MT057 has a BIOS password recovery system to prevent damage when missing password. When you forget the password, which has been set to the HMI, this HMI can execute RUN AP/Calibrate operation but cannot execute BIOS/Download AP/Clear SRAM operations. When the users want to download new AP 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.

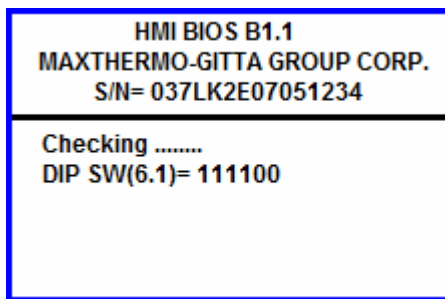
For some models of the MT037-LNT/MT035-TST/MT035-TNT there are no dip switches.

Startup test

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



FigureA-1 When there are checksum errors, that could be RTC data missing, battery failed or AP not being well downloaded.



FigureA-2 The HMI startup self-testing _power on

**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/A-2). 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

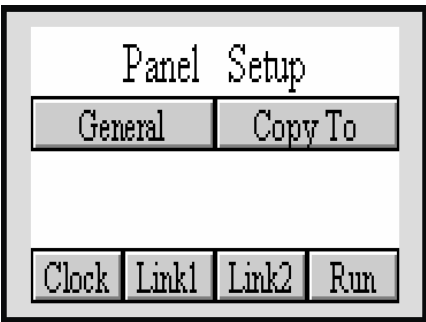
If the DIP SW1 set to off, after self-testing the MT037/MT057 will show startup menu as following figures.

The Startup menu of MT037-LSK is shown as below.

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

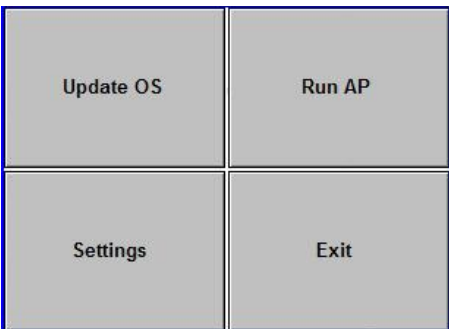


Situation 2:When SW2=ON, it will show the Panel Setup screen or customized Version screen.



The startup menu of MT057 is shown below.

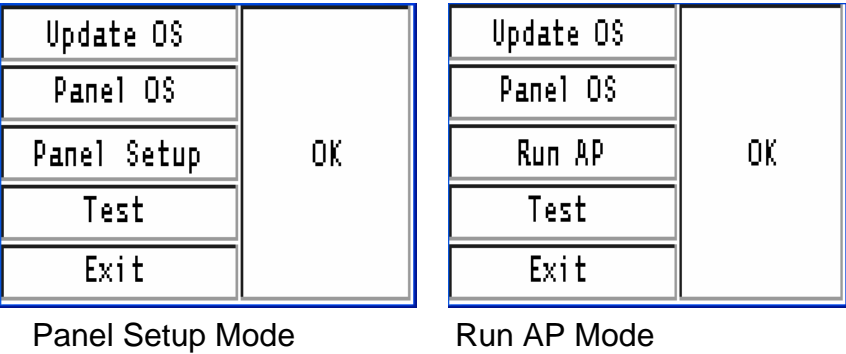
Situation 1: When SW2=OFF, it will show the default BIOS Ver. B.



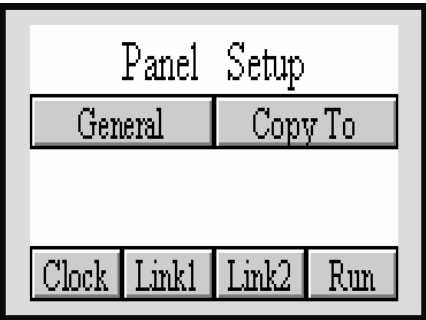
Situation 2: When SW2=ON, it will show the Panel Setup screen or customized version screen.

The Startup menu of MT037-LST/LNT are shown as below.

Situation 1: When power on, the user press touch screen till the screen show BIOS Ver.B

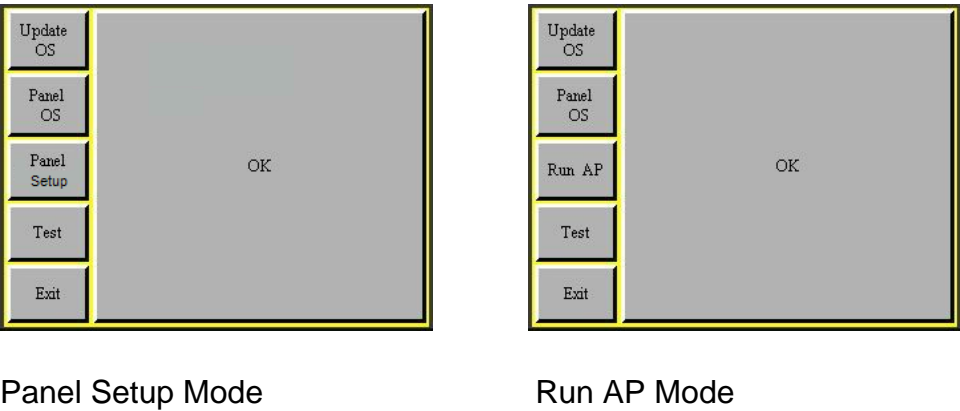


Situation 2: If there is application data in the HMI flash memory, the HMI will show Panel Setup Mode or Run AP directly while power on.

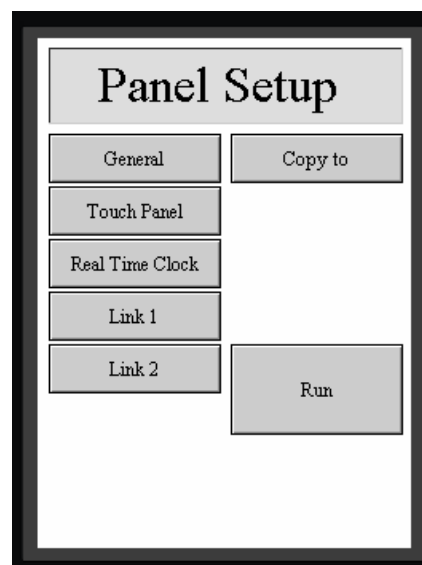
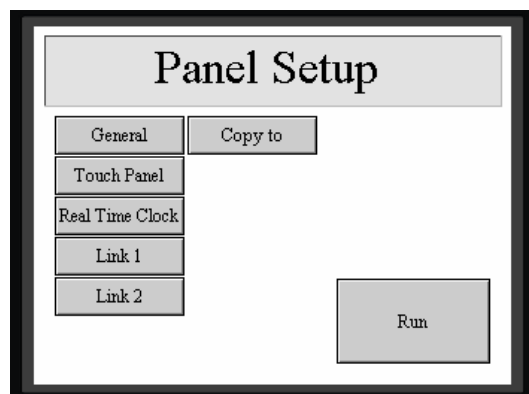


The Startup menu of MT035-TST/TNT is shown below.

Situation 1: When power on, the user press touch screen till the screen show below BIOS Ver. B



Situation 2: If there is application data in the HMI flash memory, the HMI will show Panel Setup Mode or Run AP directly while power on.



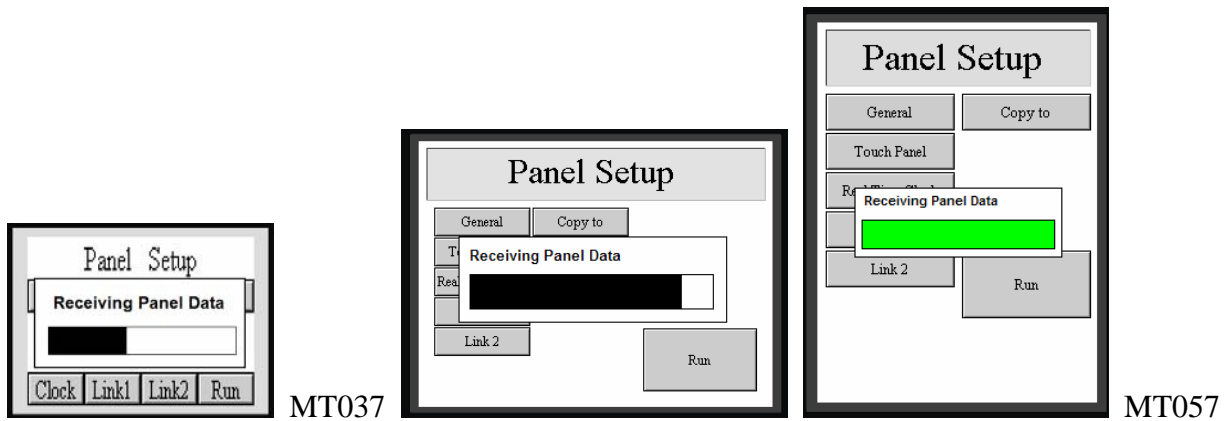
System menu	Descriptions	Password
Update OS	To receive new AP OS Ver. from COM Port.	Yes*1
Copy AP	To Copy AP to another HMI from COM1/2.	Yes*1
Clear SRAM	Clear battery backup data memory.	Yes*1
Run AP	Press "Run AP" or "ENT" to communicate with P.L.C..	None*2
Setting	HMI keys and hardware functions testing.	None
LCD Test	Check HMI LCD Display	None
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-3 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 MT037/MT057/MT058 can use as RS232C 、RS422 and RS485 while COM2 as RS422 and RS485. The COM2 of MT057/MT058 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.

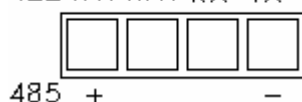
COM1 : pin definitions

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		

COM2 : 4-pin terminal.

422 TX+ RX+ RX- TX-

RS422 and RS485 .



COM2 : pin definitions (Only MT057/MT058 series support is a DB-9P male)

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 : pin definitions

Pin	Function	Pin	Function
1	Chassis ground	14	RS-422 TXD+ and RS-485 +
2	RS-232 TXD	15	RS-422 TXD- and RS-485 -
3	RS-232 RXD	16	RS-422 RXD+
4	RS-232 RTS	17	RS-422 RXD-
5	RS-232 CTS	18	(no function)
6	(no function)	19	(no function)
7	Signal ground	20	(no function)
8*	(no function)	21	
9	(no function)	22	
10	(no function)	23	RS-422 RTS+
11	(no function)	24	RS-422 RTS-
12	RS-422 CTS+	25*	(no function)
13	RS-422 CTS-		

Extension Bus Port (It's an Optional device) this port can link with other extension modules for advanced functions.

LCD adjustment

MT037-LST/ MT035-TS(N)T/ MT057-LST/ MT058-TS(N)T (LED B.L.)

To adjust the LCD contrast, adjust the LCD adjusting knob from the MT037 rear side. The MT037 is equipped with high luminance LED backlight, so adjusting the LCD brightness is not necessary.

MT057-BST/ MT057-TST (CCFL B.L.)

To adjust the MT057 LCD brightness, (Blue mode STN/Color STN LCD, TFT model can not be adjusted the brightness), press [General] from MT057 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.

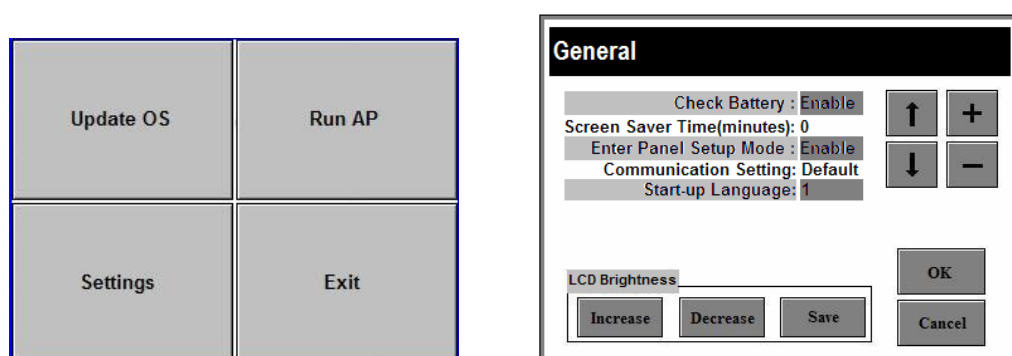


Figure A-4 MT057 Panel Setup screen_ LCD brightness adjustment

Power and grounding specifications

Use DC24V as MT037 power input. The power consumptions are as following table. To ensure the MT037/MT057 hardware working properly, to avoid outside electromagnetism noise, please ground the power source properly.

Items Models	MT037- LSK MT037-LST	MT035- TST MT035- TNT	MT057-BST MT057-LST	MT057- TST MT058- TST	MT058-TNT
Power consumption	24VDC \pm 10%; 6W		24VDC \pm 10%; 10W		
Fuse Rating	0.5A		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.

MT035/037/057/058 unit x 1 (HMI Hardware)

Power terminal x 1 (power terminal)

Communication terminal x 1 (4-pin communication connector)

Installation screw nuts x 4 (Lock for assemble with screws)

MT037/057/058 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

- ◆ MT037/MT057 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 100 Ω (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.