MMI8000 Series

MMI8056, MMI8070, MMI8080, MMI8100, MMI8104, MMI8121 Installation Instructions

1.0 Installation and Startup Guide

Install Environment

Where Used

The MMI8000 Series is designed for industrial environments. The operating temperature range is 32 to 113 °F (0 to 45 °C). It may not be suitable for using in certain outdoor applications. Please consult the factory for advised usage in outdoor applications.

NEMA Rating

The MMI8000 Series front bezel is NEMA 4 rated. When installed properly in a NEMA 4 panel, the NEMA 4 rating of the panel is not compromised. This means that fluids do not enter the panel during wash downs.

Electrical Environment

The MMI8000 Series has been tested to conform to European CE requirements. This means that the circuitry is designed to resist the effects of electrical noise. This does not guarantee noise immunity in severe cases. Proper wire routing and grounding insures proper operation.

Mechanical Environment

Avoid installing units in environments where severe mechanical vibration or shocks are present.

2.0 Installation Instructions

2.1 Mounting Instructions

2.1.1 Location Considerations

Care should be taken when locating equipment behind the unit to ensure that AC power wiring, PLC output modules, contactors, starters and relays, and any other source of electrical interference are located away from the back of the unit.

Take particular note as to the position of variable speed drives and switching power supplies. Their input and load cables should be screened to a central star earth point.

2.1.2 Making a NEMA-4 Mounting

Panel Details
The unit can be mounted into panels with a depth of 4”(105mm). It is recommended that the unit be mounted on the front panel of a steel enclosure, through an appropriate opening*.

- Allow a clearance of 1”(25mm) around the sides of the unit for mounting hardware.
- Allow clearance for cable connections to the back of the unit.
- Unit depth may vary according to cable type used. Typically, plan a depth to accommodate at least 4”(105mm) behind the panel.

NEMA-4 Mounting
Put the unit through the panel cut out. Slide the clamps into the 6 holes provided around the case. Tighten the clamping screws in an even pattern until the unit is secured in the panel.

Caution! Do not over tighten mounting clamps!

Note: Specifications To seal to NEMA-4 specifications, all supplied mounting clamps must be used and panel cannot flex more than 0.010”.

2.1.3 Environmental Considerations

The MMI8000 Series units are designed for indoors use as built in displays. Make sure that the displays are installed correctly and that the operating limits are followed (See Specifications).

- Do not operate the unit in areas subject to explosion hazards due to flammable gases, vapors or dusts.
- The unit should not be installed where fast temperature variations and/or high humidity are present. This causes condensation of water in the device.
- Do not install these terminals in environments where inflammable gases are present.

2.2 Power Connections

Make sure that all local and national electrical standards are met when the installing the unit.
Contact your local authorities to determine which codes apply.

2.2.1 Power Requirements

Power

MMI8000 units are powered by DC power only. The specified voltage range is 24±5% Volts DC. This insures compatibility with most controller DC systems.
The power conditioning circuitry inside the unit is accomplished by a switching power supply. The peak starting current can be as high as 700mA.

Fusing Requirements

If the display does not come on within 2 seconds of power up, remove power. An internal fuse prevents damage if the polarity of the DC power is incorrect. Check wiring to insure proper connections and try to power up again.

High Voltage Caution

An Internal fuse prevents damage for over voltage condition however it isn’t guaranteed.

DC voltage sources should provide proper isolation from main AC power and similar hazards.

Caution Emergency Stop

A Hard-wired EMERGENCY STOP should be fitted in any system using an MMI8000 to comply with ICS Safety Recommendations.

Caution Supply Voltage

Do not power the MMI8000 and inductive DC loads, or input circuitry to the controller, with the same power supply.

Note: The 24 VDC output from some controllers may not have enough current to power the MMI8000.

Caution Wire Routing

Wire lengths should be minimized (Maximum 1600' (500 m) shielded, 1000' (300 m) unshielded).

Wires should be run in pairs with a neutral or common paired with a hot or signal line.
If wiring is to be exposed to lightning or surges, use appropriate surge suppression devices.
Keep AC, high energy, and rapidly switching DC wiring separate from signal wires.
Equip ungrounded DC supplies with a resistor and capacitor in parallel to earth ground. This provides a path for static and high frequency dissipation. Typical values to use are 1MOhm and 4700pF.

Connection

To make a connection, strip about 3/8" of insulation off the end of the wire, turn the connector screw counterclockwise until the gap is wide open, insert the wire all the way in, and turn the screw clockwise until it's tight.

Connect positive DC line to the '+24V' terminal and the DC ground to the '0V' terminal.

2.2.2 Grounding Requirements

Chassis ground must be used. DC ground is not directly coupled to Earth ground internally. It is preferable not to ground DC negative return to chassis ground as poor site earths can introduce noise into a system, but if necessary an earth connection should be made, from the power supply return point to the central star earth point. Ground conductors should be as short and as large in size as possible. The conductors must always be large enough to carry the maximum short circuit current of the path being considered. Ground conductors should be connected to a tree from a central star earth ground point. This ensures that no ground conductor carries current from any other branch.

2.2.3 CE Requirements

To make an MMI8000 comply with EMC directives, and to reduce susceptibility to electrical interference, a separate #14 AWG ground wire should be taken to the chassis ground terminal of the power connector. This ground connection should be run directly to the central star earth connection point (as recommended in most Installation Instructions).

2.2.4 Safety Guidelines

This section presents recommended installation practices, and procedures. Since no two applications are identical, these recommendations should be considered as guidelines.

Hardware Considerations

WARNING!
The system designer should be aware that devices in Controller systems could fail and thereby create an unsafe condition. Furthermore, electrical interference in an operator interface, such as an MMI8000, can lead to equipment start-up, which could result in property damage and/or physical injury to the equipment operator.

If you, or your company, use any programmable control systems that require an operator or attendant, you should be aware that this potential safety hazard exists and take appropriate precautions. Although the specific design steps depend on your particular application, the following precautions generally apply to installation of solid-state programmable control devices. In addition, these precautions conform to the guidelines for installation of Controllers as recommended in the NEMA ICS 3-304 Control Standards.

Programming Considerations

To conform with ICS Safety Recommendations, checks should be placed in the controller to ensure that all writable registers that control critical parts of plant or machinery have limit checks built into the program, with an out-of-limit safe shut down procedure to ensure safety of personnel.

ICS 3-304.81 Safety Recommendations:
Consideration should be given to the use of an emergency stop function, which is independent of the programmable controller.
Where the operator is exposed to the machinery, such as in loading or unloading a machine tool, or where the machine cycles automatically, consideration should be given to the use of an electromechanical override or other redundant means, independent of the programmable controller, for starting and interrupting the cycle.
If provision is required for changing programs while the equipment is in operation, consideration should be given to the use of locks or other means of assuring that only authorized personnel can make such changes. These recommendations are intended as safeguards against the failure of critical components and the effects of such failures or the inadvertent errors that might be introduced if programs are changed while the equipment is in operation. *

- The ICS 3-304.81 Safety Recommendations are reproduced by permission of the National Electrical Manufacturers Association from NEMA ICS 3-304

2.3 Communications Connections

The ports as you look at the back of the case, are the ports for connecting to a PLC or some external device (Controller Connectors).

2.3.1 Connector COM1 [RS232], COM2 [RS232]

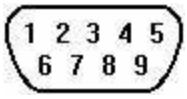
Cable Requirements — Different cables are required for various devices.

Caution — Restrict cable length to less than 500' (150m) for RS485/422 devices and 50' (15m) for RS232 devices to avoid communications problems.

The COM light on the front of the MMI8000 turns on with each Ethernet communication.

Shielded cable must be used for long lengths or cables run in an electrically noisy environment. Do not run cables next to AC power lines or near sources of electrical noise.

Be sure that the cable ends have been inserted all of the way into mating connectors and are secure



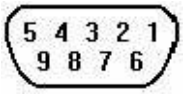
Pin assignment of the 9 Pin, Male, SUB-D, COM1 [RS-232] and COM2 [RS-232] Port.

Pin Designations
COM1 [RS-232]
COM2 [RS-232]

Pin #	Symbol	COM1 [RS232]	COM2 [RS232]
1	Not used		
2	RxD	Received Data	
3	TxD	Transmitted Data	
4	TxD		Transmitted Data
5	GND	Signal Ground	Signal Ground
6	RxD		Received Data
7	RTS	Ready to send output	
8	CTS	Clear to send input	
9	Not used		

2.3.2 Connector COM1[RS485] , COM3[RS485] and COM3[RS232]

The 9 Pin, Female, SUB-D, COM1 [RS-485] , COM3 [RS-485] and COM3 [RS-232] Port on the back of the unit is the RS-232 and RS485/422 communications port for connecting to a controller.

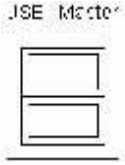


Pin assignment of the 9 Pin, Female, SUB-D COM1 [RS-485], COM3 [RS-485] and COM3 [RS-232] Port

Pin Designations
COM1 [RS-485]
COM3 [RS-485]
COM3 [RS-232]

Pin#	Symbol	Com1 [RS485]2w	Com1 [RS485]4w	Com3 [RS485]	Com3 [RS232]
1	Rx-	Data-	Rx-		
2	Rx+	Data+	Rx+		
3	Tx-		Tx-		
4	Tx+		Tx+		
5	GND	Signal Ground	Signal Ground	Signal Ground	Signal Ground
6	Data-			Data-	
7	TxD				Transmit
8	RxD				Receive
9	Data+			Data+	

2.3.3 USB Host port



Supports various devices with USB interface, such as mouse, keyboard, USB stick, printer…etc.

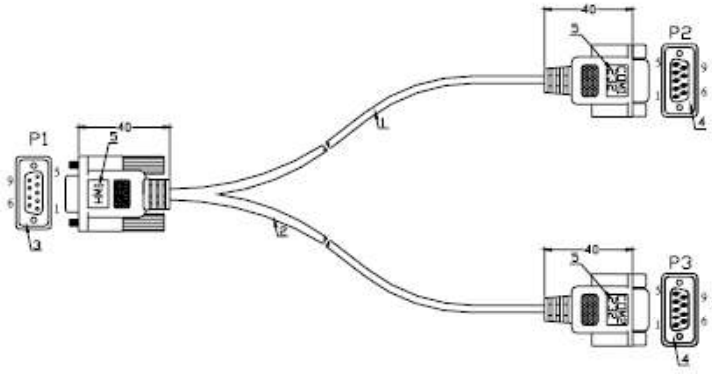
2.3.4 Connecter Wire

MT8-Ethernet/RZC045120: Direct connect (Ethernet crossover cable)

MT8000 Ethernet RJ45	Wire color		PC or Note Book RJ45
1 TX+	White/Orange	----------	3 RX+
2 TX-	Orange	----------	6 RX-
3 RX+	White/Green	----------	1 TX+
4 BD4+	Blue	----------	4 BD4+
5 BD4-	White/Blue	----------	5 BD4-
6 RX-	Green White/Brown	----------	2 TX-
7 BD3+	Brown	----------	7 BD3+
8 BD3-		----------	8 BD3-

Adapter Cables

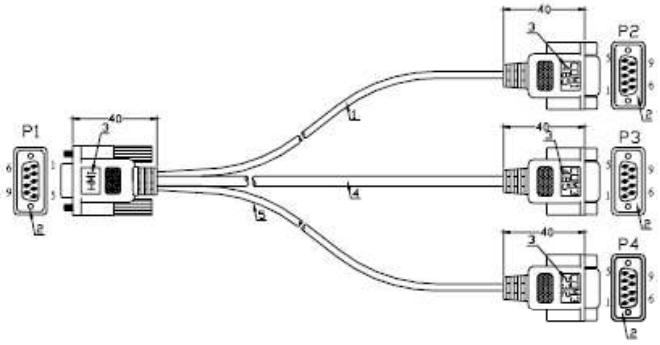
MT8-COM1/RZC002320



Pin Out

P1	P2	P3
1		
2==>	2	
3==>	3	
4========>		3
5==>	5==>	5
6========>		2
7==>	7	
8==>	8	
9		

MT8-COM3/RZC004850



Pin Out

P1	P2	P3	P4
1==>	1		
2==>	2		
3==>	3		
4==>	4		
5==>	5==>	5==>	5
6========>		1	
7==========>			3
8==========>			2
9========>		2	

2.3. Dip Switch Settings

	SW1	SW2	SW3	SW4	Mode
	OFF	OFF	OFF	OFF	Application mode (On line operations, use ProjectManager or EasyBuilder8000 to change modes)
	ON	OFF	OFF	OFF	Force to Touch Adjust mode (Used for touchscreen calibration) Reset project memory and settings to default.
	OFF	OFF	ON	OFF	Force to Boot ROM Loading Mode
	OFF OFF	ON OFF	OFF OFF	OFF ON	Reserved

MMI touch screens are calibrated before leaving the factory. Adjustment should not required.
If for some reason the touch screen needs recalibration. Use the following procedure.

Touchscreen calibration mode is entered by setting dip switches and resetting or cycling power to the unit.

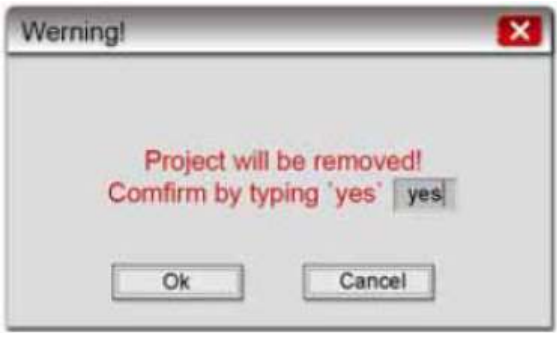
1. Set dipswitch 1 in the UP (ON) position. Leave all other switches in the DOWN (OFF) position.

2. Cycle power to the HMI or press the reset button located near the dipswitches. The MMI8000 powers up to the Touch screen calibration mode.

3. Follow the instructions on the screen. Briefly touch the center of the cross hairs "+" as they appear in all 5 positions (4 corners and center). When all five "+" are done the "+" disappears. The touch information is processed and calibration is completed.

4. After calibration, the Password Reset dialog appears. If you wish to reset the password, you may do so at this time. Otherwise select "NO" to continue on to the Boot-up process. If no action is taken, after a short time, the unit automatically moves on to the Boot-up process.

When "YES" is chosen, another pop-up dialog appears as below.



Users must confirmed the reset again by inputting "YES".
Click OK. (The default password 111111 is restored. However, other passwords, including download and upload password, must be reset.)

Note: When the reset action is taken, saved projects and data in the HMI are all cleared.

5. Be sure to put Dipswitch 1 in the DOWN (OFF) position when done. Otherwise, the unit always goes to the Touchscreen calibration mode on power up.

2.4 CE Requirements

EU directives that apply to the MT-8000 Series:

- EMC Directive (89/336/EEC, 92/31/EEC, 93/68/EEC) electromagnetic emissions and immunity
- Machinery Directive (89/392/EEC, 91/368/EEC, 93/44/EEC, 93/ 68/EEC) machine safety
- MMI8000 products are CE-marked to indicate compliance with the EMC Directive.

The MMI8000 Series has been designed to operate satisfactorily in electromagnetic noise (immunity) and without emitting high levels of electrical noise into the environment (emission). The units are designed to meet European Community standards when installed per the wiring instructions in this manual.

Compatibility Standards The MMI8000 has been designed to meet electromagnetic compatibility for industrial environments.

- CISPR (EN 55011) Group 1, Class A Radiated Emissions levels
- EN50081-2 Generic emission standard, industrial environment (Also US FCC Class A)
- EN50082-2 Generic immunity standard, industrial environment

3.0 Specifications

Hardware Specifications

Item	MMI8121	MMI8100/8104/8104H	MMI8080	MMI8056/8070H
Display	12.1" TFT	10.0" / 10.4" TFT	8.0" TFT	5.6 / 7.0" TFT
Color	65536 color	65536 color	65536 color	65536 color
Contrast Ratio	200:1	300:1	250:1	150:1
Resolution (WxH dots)	800 x 600	800x480 / 640x480	640x480	320x234 / 480x234
Back light	CCFLx2	CCFLx2	CCFLx1	LED
CCFL life time (avg.)	50,000 hr.	50,000 hr.	50,000 hr.	30,000 hr.
Touch panel	4 wires resistive type			
I/O Port	COM1 (RS-232/RS-485 2W/4W), COM2(RS232), COM3(RS-232/RS-485 2W)			
Ethernet Port	1 Ethernet port (10/100 Base-T)*			
USB Host Port	3 USB Host ports			2 USB Host ports
Audio Port	1 x Audio Line Out			
Processor	32bit RISC CPU			
Flash Memory	32MB			
Compact Flash Card Slot	Type I x 1			
Real Time Clock/Calendar	Built-in			

*Ethernet not available on 6056, 6070H and 6100 units

General Specifications

Input Power	24VDC±5%			
Maximum Power Consumption	500 mA@24VDC	440 mA@24VDC	440 mA@24VDC	340 mA@24VDC
Protection structure	IP65 front panel (O ring seal)			
Operating Temperature	0~45°C			
Operation humidity	10-90% RH (non – condensing)			
Enclosure	Plastic			
Dimensions WxHxD	323 x 243 x 51mm	286x212x50mm	240x179x50mm	204x150x48mm
Panel cutout dimension	303 x 230 mm (12"x9.05")	259x 201 mm(10.1"x7.8")	223 x 168 mm (8.7"x6.5")	192 x 138 mm (7.56" x 5.43")
Weight	Approx.2.1 kg (4.63 lbs)	Approx.1.5 kg (3.3 lbs)	Approx. 1.3 kg (2.87 lbs)	Approx. 0.85 kg (1.87 lbs)

We hope you will be pleased with our products. If you have any questions concerning our warranty, repair, modification or returned goods process, please contact your local KEP distributor or the KEP Customer Service Department.

Warranty

This product is warrantied against defects in materials and workmanship for a period of one (1) year from the date of shipment to buyer.

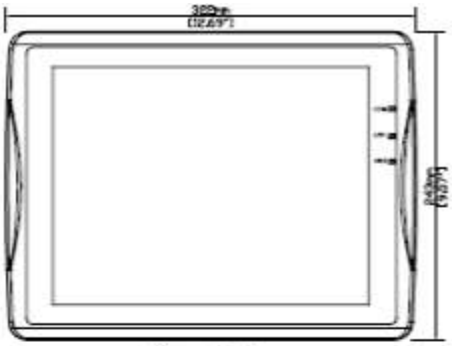
The warranty is limited to repair or replacement of the defective unit at the option of the manufacturer. This warranty is void if the product has been altered, misused, dismantled, or otherwise abused.

ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, ARE EXCLUDED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

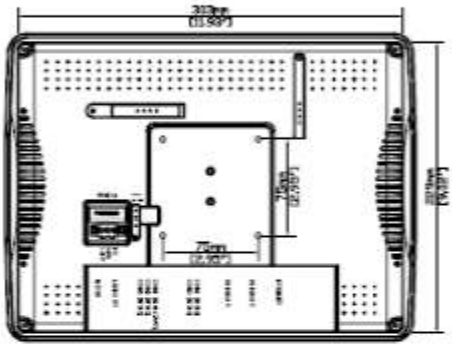
Dimensions

Drawings are not to scale and are for visual purposes only.

MMI8121

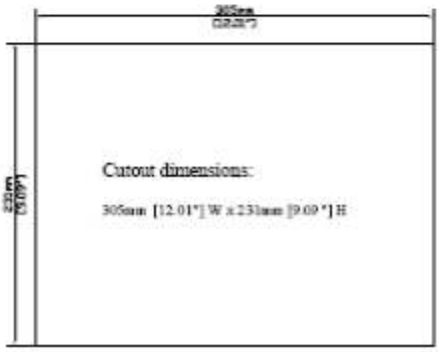


Front View



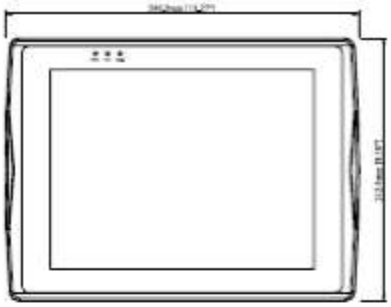
Rear View

Bottom View

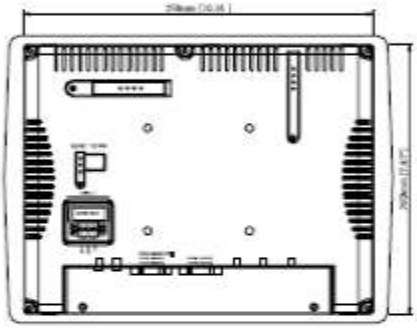


Panel Cutout

MMI8100/8104

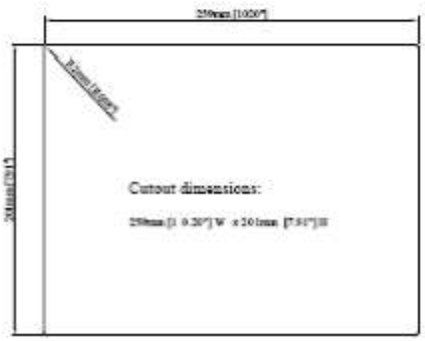


Front View



Rear View

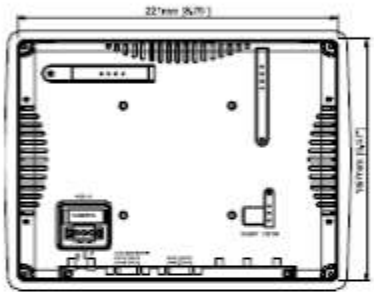
Bottom View



Panel Cutout

MMI8080

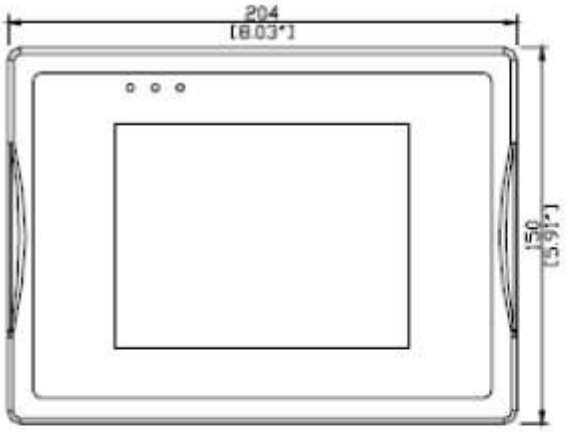
Front View



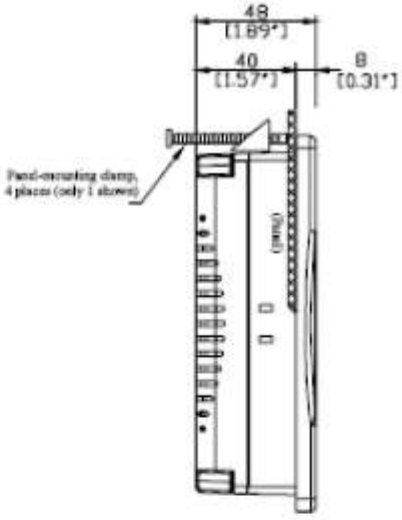
Rear View

Bottom View

Panel Cutout

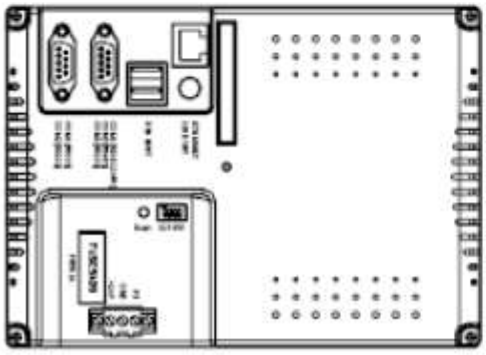


Front View

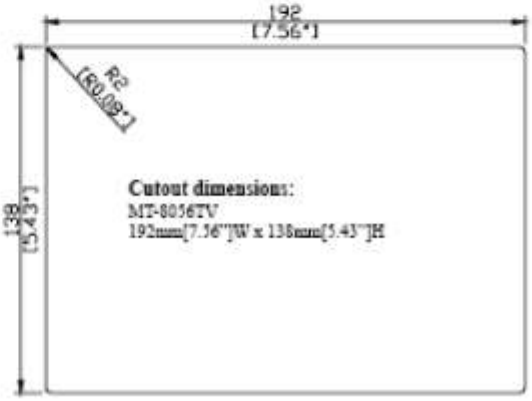


Side View

Bottom View



Rear View



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