

M2I Corporation



Industrial HMI Touch Panel

TOPRH-W(Wireless)

Hardware Manual

Thank you for using Industrial HMI Touch panel series of M2I corporation.

Please read this manual carefully to know installing, wiring, operating, servicing and inspecting this equipment.

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Chapter 1. Safety Precaution

■ Before using the product

To use the product safely and effectively, please read the contents of this manual thoroughly before use. Please keep to the safety precaution, for it is to prevent accidents and potential danger from occurring. Safety precaution is classified into 'Warning' and 'Caution' and their meanings are as follows. Also the indicated illustrations on the product and in the manual have the following meanings.



 Warning	Violating the instruction may result in serious personal injury or death.
 Caution	Violating the instruction may result in slight personal injury or product damage.
	Be cautious, for danger may be present.
	Be cautious, for there is a possibility of an electric shock.

■ General Precaution Caution

-  Do not press the screen using hard or sharp objects (drill, pen, drive etc.) or too strong. It may cause malfunction of touch due to damage of the front sheet.
-  Do not operate or store in an environment with high vibration.
-  Do not allow foreign objects such as water, liquids, or metal powders to enter the product. It may cause breakage or electric shock.
-  Do not allow foreign objects such as water, liquids, or metal powders to enter the product. The screen may not be clear or the touch may malfunction.
-  Use the radio or mobile phone at least 30cm away from the body. High-frequency radiation equipment, such as mobile phones, around the body may cause malfunctions in the plant.
-  Two or fewer bright spots may appear on the LCD screen, and certain areas may appear brighter. It is not a defect but LCD characteristic.
-  Do not store or operate this product in direct sunlight. Direct sunlight can change the properties of the LCD.





■ Design Precautions Warning

Install protection circuit on the outside of Products to protect the entire control system when external power supply or Products have problems.




-  When computer or other controllers communicate and exchange data with products or change operation mode of products, set up protective sequence program in PC or Controller for protecting system from communication error.
-  The output signal or communication lines should be separated from the power line or high tension wire. They should be installed 100mm (3.94 Inch) or more from each other.

■ Installation Precaution Warning


Do not install the location which exceeds allowed temperature. Product can be damaged or shorten the life. Especially install environment as below should be avoided.

-  Do not Install product to the place which the ambient temperature is out of limits, from 10°C to 45°C or on the surface of control board which high pressure equipment is installed.
-  Do not install to the place where strong shock or vibration continuously have impacted on product.
-  Do not block the vents of the cradle to improve water retention and ventilation.
-  Indoor use only.


■ Operation Precautions Caution

-  Strong shock or force may interfere with operation of the unit.
-  After a strong machine operation, check that the main unit and safety related parts operate normally.
Simultaneous operation of equipment systems with multiple units installed is not recommended.
Block simultaneous operation with proper configuration.
-  High-frequency radiation equipment, such as mobile phones, around the body may cause malfunctions in the plant.

■ Disposal Precautions Caution

-  When disposing of the product and battery pack, treat it as industrial waste. There is a risk of toxic material formation or explosion.






■ Specification and Exchanging of Battery for RTC Caution

-  The MS920SE rechargeable battery, which is fixed to the main board, is not intended to be replaced by the user.








Item	Content
Battery Voltage	DC 3V(MS920SE)
Battery Name	MS920SE(lithium ion battery / not replaceable)
Battery Life	Permanent(When the ambient temperature is 25 ° C)
Battery discharge	About 7 days after power off

* Depending on the model specifications are subject to change.

■ Battery Pack Precautions and Disposal Caution


-  Please charge only with the cradle of this product. Using other chargers may cause fire or explosion.
-  Do not modify, disassemble or repair the product. There is a risk of fire, electric shock or explosion.
-  Do not charge or use the battery in explosive atmospheres with flammable liquids, gases, or dust.
-  Do not push the battery pack too hard into the body. The battery pack may be ruptured.
-  Even if the battery pack is badly damaged or completely old, never burn it. Please contact your vendor.
The longer the battery pack is used, the shorter the use time. When using less than about 300 times of full charge and full discharge, it has more than 75% operation time.
For long-term storage (1 year), please store in a dry and -20 to +20 ° C environment without receiving direct sunlight.

■ Cradle Precautions Caution

-  Only charge the battery pack of this product. If used for other purposes, there is a risk of fire or electric shock.
-  Be careful not to get conductive or foreign objects (liquid, dust, metal powder, pencil lead, etc.) into the metal charge contacts.
-  Do not modify, disassemble or repair the product. There is a risk of fire or electric shock.
-  Do not block the ventilation holes. If the ventilation holes are blocked with objects it may overheat.
-  If the battery has been severely shocked, dropped, or damaged in any other way, do not charge the battery and contact the service center.
-  Do not connect two input voltage ports at the same time.
-  The cradle is designed to operate at DC voltage. Do not use AC voltage.

■ All field-wiring connections to this unit shall be from Limited Voltage / Limited Current, below 24 Vdc isolated secondary source with an output fuse, or Class 2 secondary circuits.

■ Available countries of this product (European country applications)

									
AT	BE	CY	CZ	DK	EE	FI	FR	DE	GR
HU	IE	IT	LV	LT	LU	MT	PL	PT	SK
SI	ES	SE	NL	GB	CH	LI	NO	IS	BG
HR	RO	TR							

Chapter 2. Overview

2.1 Product Introduction

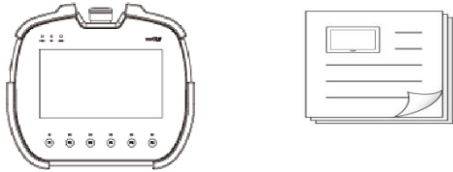
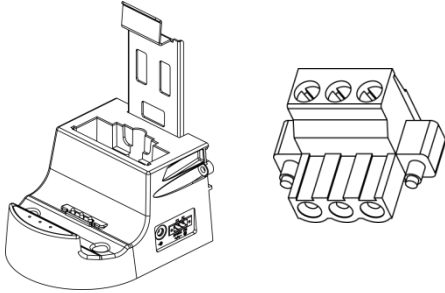
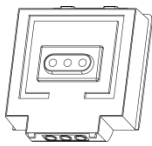
This industrial HMI touch panel is an industrial control device required in the industrial field. This product is connected to other unit(PLC) via wireless and controlled and communicated.





This product is battery powered and ergonomically designed to optimally support the operator for safe and consistent operation in plant system operation and monitoring.

2.2 Package Contents

Package contents of TOPRH-W Series are below.

please make sure that all of components are in the package Series before using TOPRH-W.

Item	Figure	Quantity
Installation and User Manual		1
Cradle and Connector (Rechargeable Auxiliary Battery Pack)		User Options
Battery Pack		User Options

<p>Accessories (Sold separate)</p>	 <p>USB Memory</p>  <p>USB Cable</p>  <p>SD Card</p>  <p>Front Protect Sheet</p>	<p>User Options</p>
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2.3 Explanation of Model name

TOPRH	07	00	W	D	-	W
Series	Display Size	Option	LCD	Power		
	07 : 7.0"	00 : Standard	W : WIDE	D : DC		W : Wireless
		10 : Premium		A : AC		

Chapter 3. General Specifications

3.1 Power Specifications

Main Body Battery Pack	Battery Voltage Range	DC 6.0 ~ 8.4V	
	Cell Type	Lithium-Ion (2S2P)	
	Voltage Range	7.26V (Standard)	8.40V (Maximum)
	Consumption	20W less	
	Operating time	6 Hours (*Low Voltage Warning)	
	Charging time	3 Hours (*Full Charge)	
	Charging Capacity	6500mAh (Minimum)	6700mAh (Normal)

* The operating time and charging time are based on 25 ° C ambient temperature and may vary depending on ambient temperature.

3.2 Display Specifications

Type	7" TFT Color
Resolution	1024 X 600
Display Color	16M Color LCD
Brightness Control	10 Steps (Software Tuning)
Backlight	LED
Backlight Lifespan	More than 50,000 Hours
Display Character Type	Supporting Vector Font for Windows Free Scaling Image Character
Front LED Display	Power, Operating, Communication State Display

3.3 Touch Specifications

Operating Formula	Analog Resistive Touch Method
Mechanical life(times)	About 10 Million

3.4 Memory Specifications

Screen Memory	128MB
Backup Memory	512KB: System buffer (10K Word), Including Alarm/Log/Recipe
Backup Period	Permanent
Real Time Clock	Built in (by Battery)

3.5 Wireless Specifications

Frequency Range	Output Power (Maximum)
2412 ~ 2472 MHz (WLAN 2.4GHz)	7.32 dBm e.i.r.p
5150 MHz ~ 5350 MHz (WLAN 5 GHz, Lower sub-band)	6.70 dBm e.i.r.p
5470 MHz ~ 5725 MHz (WLAN 5 GHz, Higher sub-band)	11.94 dBm e.i.r.p.

3.6 Operating mode frequency band

Frequency Range	Mode
2400 ~ 2483.5MHz	802.11b, 802.11g, 802.11n(HT20), 802.11n(HT40)
5150 MHz ~ 5350 MHz	802.11a, 802.11n(HT20), 802.11n(HT40)
5470 MHz ~ 5725 MHz	802.11a, 802.11n(HT20), 802.11n(HT40)

3.7 Antenna infomation

Antenna Model Name	WE12-WO-01
Antenna Type	Internal Antenna
Manufacturer	WINiZEN Co., Ltd.

3.8 Environment Specifications

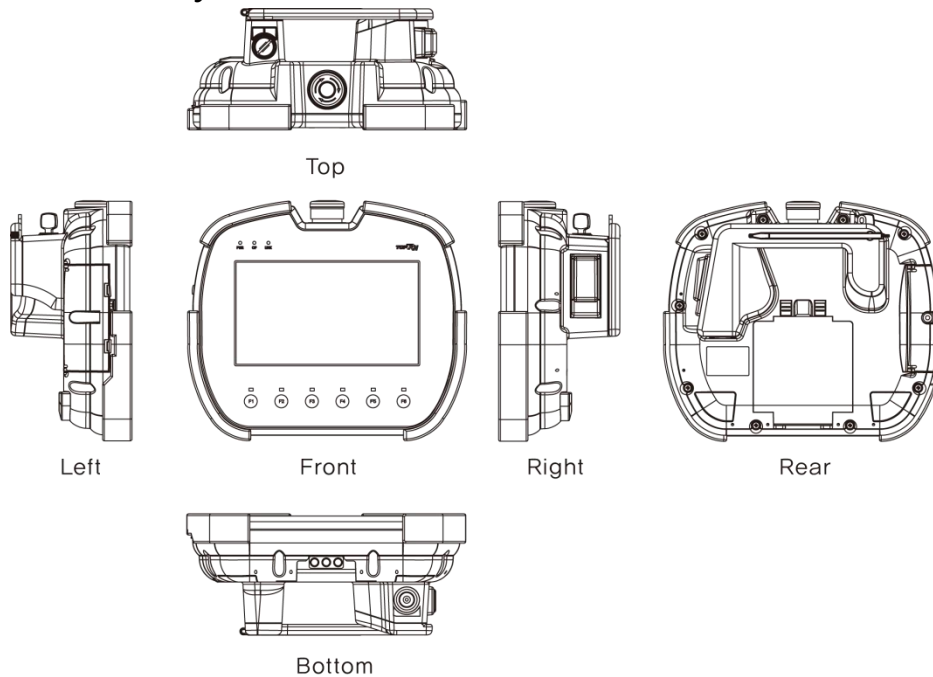
Operation Temperature (°C)	10 ~ +45
Storage Temperature (°C)	-20 ~ +60
Operation Humidity (%RH)	0 ~ 90 (No dew)
Atmosphere	No corrosive gas
Vibration Endurance	Amplitude: 10≤F < 25 Hz(2G) X,Y,Z each direction(for 30 minutes)
Static Electricity Discharge	Connective discharge from EN61000-4-2: ±4 kV
Shock Endurance	10G X,Y,Z each direction(for 3 times)
Surge Voltage	500V(Line-Line)
Protection Classification	Conform to IP65

3.9 Structure Specifications

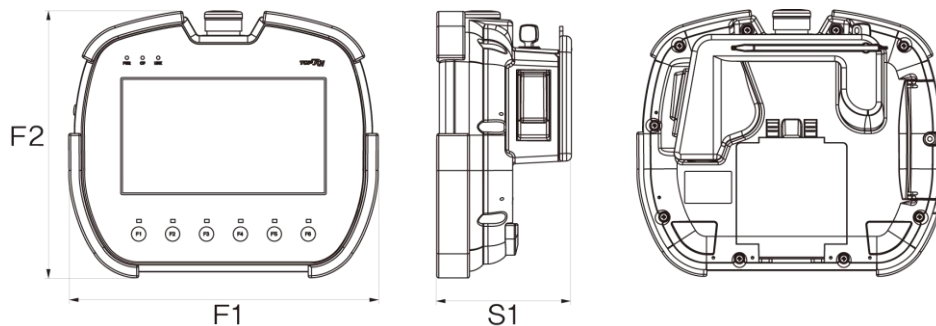
Weight (Kg)	Main Body (Including Battery Pack): 1.3 Cradle: 0.6
Cooling System	Natural air circulation
Case Material	PC(Flame Retardant)

Chapter 4. Parts Identification and Functions

4.1 Main Body

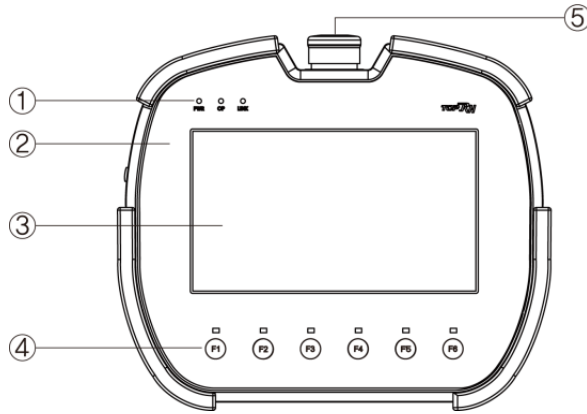


4.1.1 External Dimension



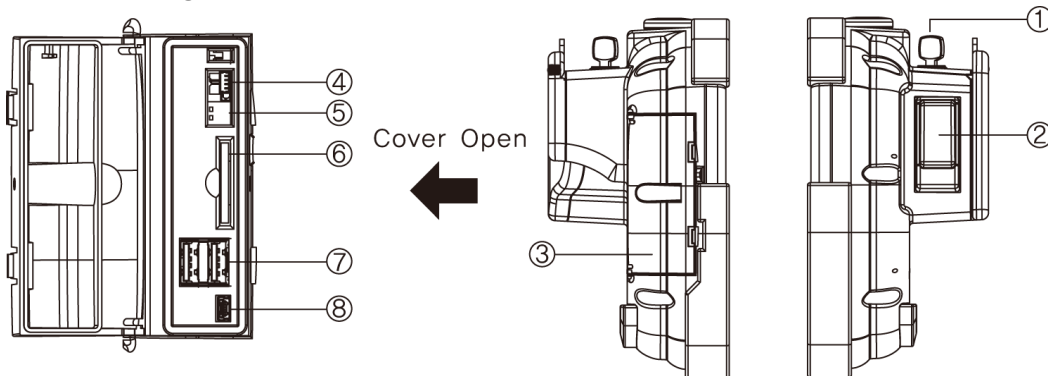
F1(mm)	F2(mm)	S1 (mm)
237	205	103

4.1.2 Front Part Names and Specifications



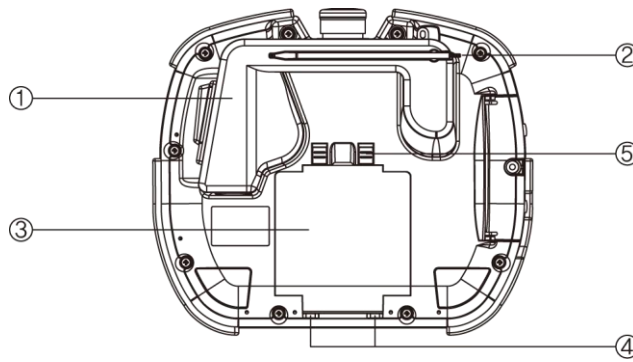
No.	Title	Description	Etc.
①	Display LED	Power, Operating, Communication State Display	
②	Front Sheet	Front Vinyl Cover Sheet for Damp Proof and Dust Proof	
③	Touch Panel	Analog Touch	
④	Function Switch	Connect to external device terminal such as PLC and control contact point	
⑤	Emergency Switch	In case of emergency, emergency switch	User Options

4.1.3 Left, Right Part Names and Specifications



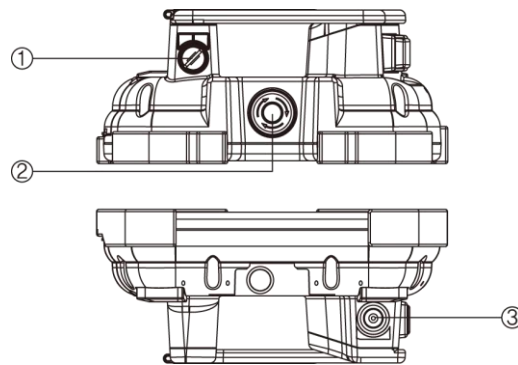
No.	Title	Description	Etc.
①	Key Switch	Connect to external device terminal such as PLC and control contact point	Users Options
②	3Position Enable Switch	3 state handles on the right, Three-stage operation switch	Users Options
③	Side Cover	Including SD Card, USB Device/Host, Mode Switch	
④	USB Device	Drawing and Logging Data Download	
⑤	Mode Switch	System Mode Setting Switch	
⑥	SD Card	Drawing and Logging Data Up/Download	
⑦	USB HOST	Connector for USB storage option	
⑧	Diagnostic Port	Manufacturing and Maintenance Port	Manufacturers Only

4.1.4 Rear Part Names and Specifications



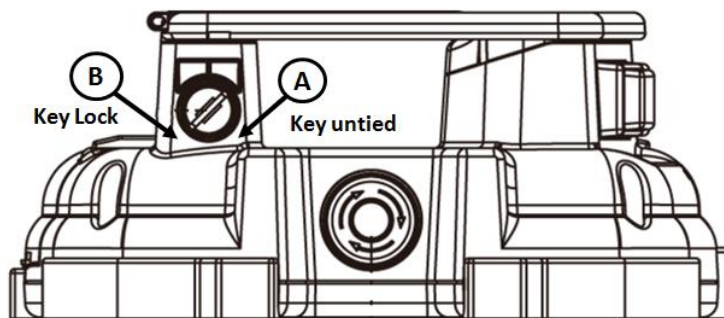
No.	Title
①	Handle
②	Touch pen
③	Option pack
④	Option Pack Conclusion Slot
⑤	Option Pack Lock

4.1.5 Upper, Lower Part Names and Specifications



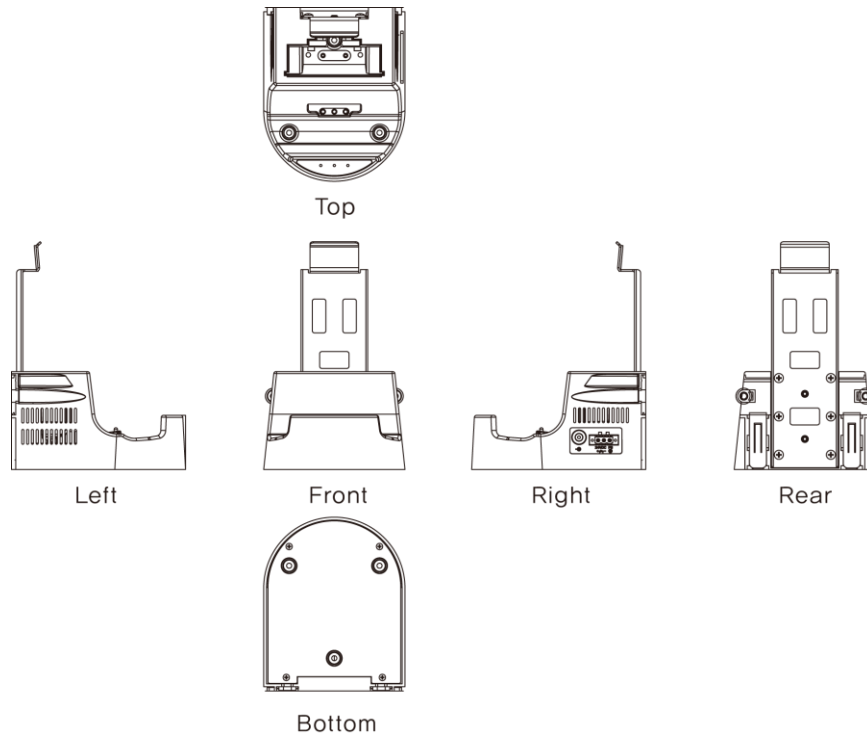
No.	Title	Description	Etc.
①	Key Switch	Connect to external device terminal such as PLC and control contact point	Users Options
②	Emergency Switch	Emergency switch in case of abnormal occurrence	Users Options
③	Power Switch	Switch for Power On/Off	

4.1.6 Keylock switch contact



4.2 Cradle

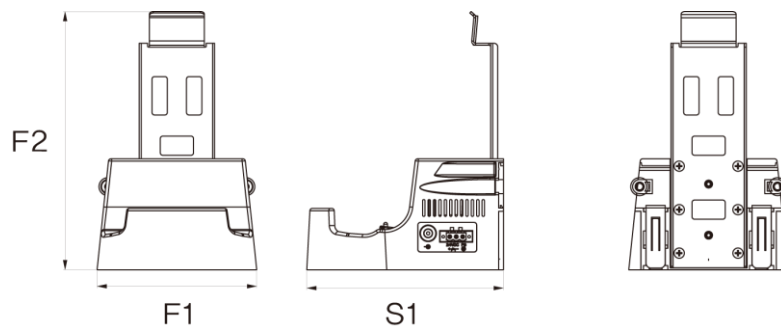
Main Body Battery Pack and Auxiliary Pack Charge



4.2.1 Power Specifications

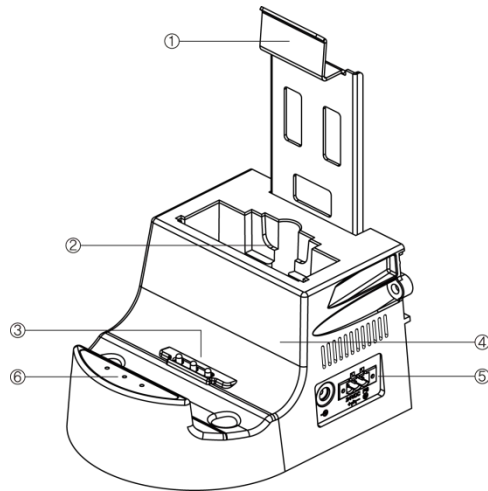
Rated Voltage		DC24V
Input Voltage Range		DC 18~28V
Charging Consumption	Operating with main body battery pack	Under 20W
	Charging after the main battery pack is completely discharged	Under 40W
	Charging after the main, Auxiliary battery pack completely discharged	Under 80W

4.2.2 External Dimension



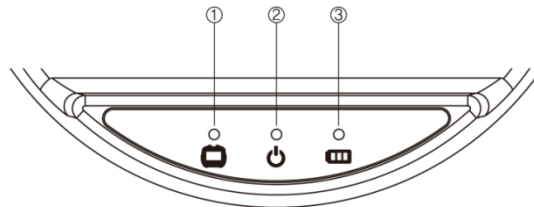
F1(mm)	F2(mm)	S1 (mm)
125	214.5	154

4.2.3 Part Identification



No.	Title
①	Mount Link
②	Charging Auxiliary Battery
③	Charging Terminal
④	Mount Slot
⑤	Power Input
⑥	Charging State LED

4.2.4 Charge State LED



No.	Title	LED State
①	Main Body Battery Pack	Green: Full Charge Orange: Charging
②	Power	Blue: Supply Power
③	Auxiliary Battery Pack	Green: Full Charge Orange: Charging

Chapter 5. Interface

In order for the main unit to communicate with an external device, it is necessary to connect the two devices by referring to the following.

5.1 WLAN Specification

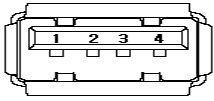
Frequency Range	- 2.4G: 2.4000GHz ~ 2.4835GHz - 5G: 5.150GHz ~ 5.725GHz
Antenna Type	Built in Antenna
Security Setting (*AP side Setting)	WEP(64/128) WPA-PSK+(TKIP,AES) WPA2-PSK+(TKIP,AES) *AES Recommend
Wireless Accessory	N/A

* This product can not be used simultaneously at 2.4 GHz and 5 GHz.

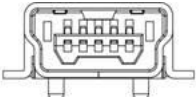
* This EUT is a client device without radar detection function in DFS Bands.

5.2 USB Interface

5.2.1 USB Host

Form	Title	Description
	USB Interface	EHCI/OHCI Specification Version 1.0, USB2.0/1.1 compatible
	Communication Method	Control/Bulk
	Transfer Speed	480Mb/s
	Support Device	USB Storage (FAT16/FAT32 File Format Available)
	Connector Type	Type A(2ch)

5.2.2 USB Device

Form	Title	Description
	USB Interface	USB 2.0
	Communication Method	Interrupt/Bulk/Isochronous
	Transfer Speed	480Mb/s
	Supporting OS	Windows 98SE/2000/XP/VISTA/7/10(32/64bit)
	Cable Length	1.5m(recommended to use M2I's Option Cable)
	Connect Method	MINI USB B, Female

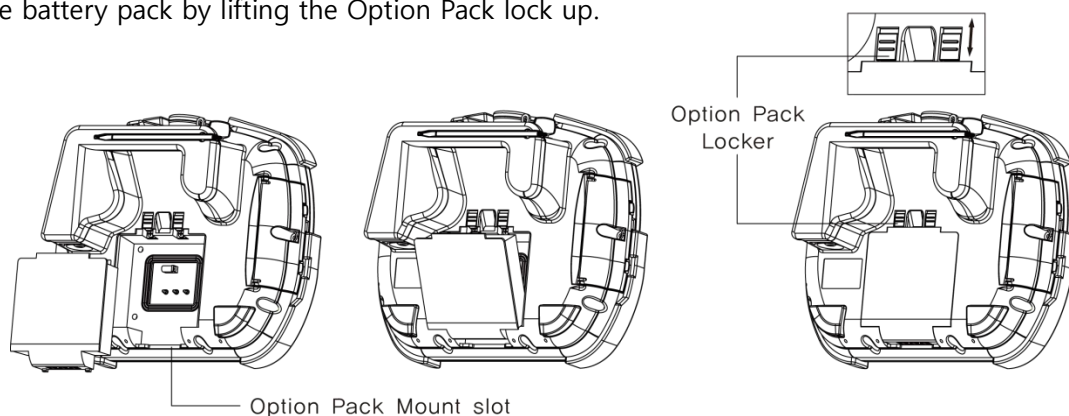
Chapter 6. Installation Warning

6.1 Specifying Install Location

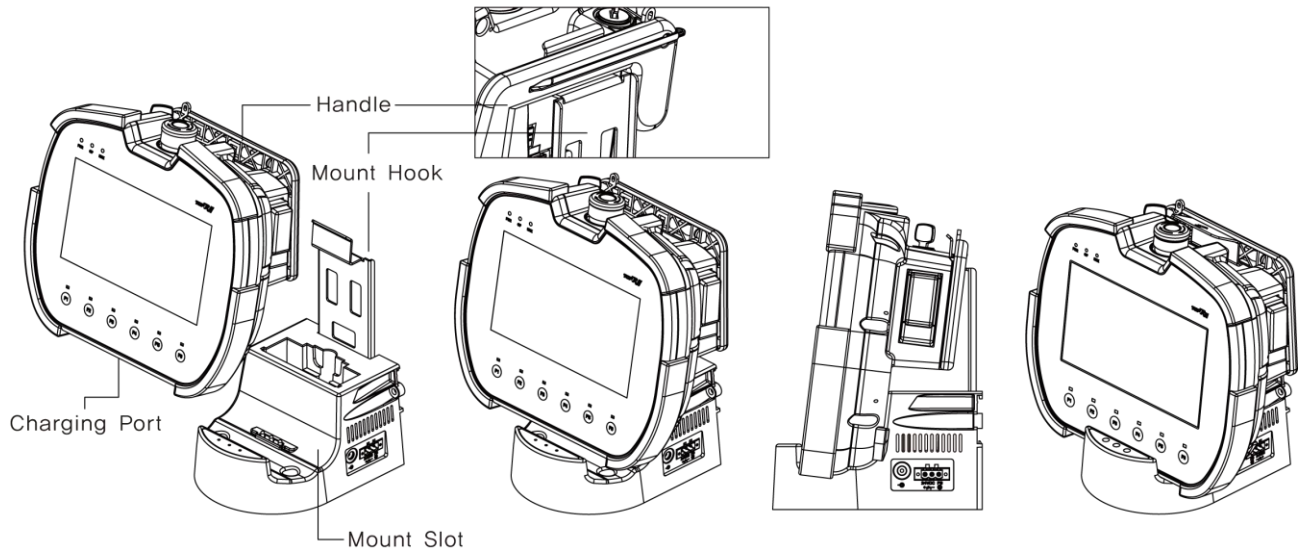
- Where the operation of the main body is guaranteed when the charger is mounted
- Where connection and separation of body and cradle are convenient.
- Where the body and the AP are opened
- Where direct sunlight is not exposed

6.2 Body, Battery Pack combination and separation

- Slide the battery pack into the option pack fastening slot on the main body.
- Lower the Option Pack lock to secure the battery pack.
- the battery pack by lifting the Option Pack lock up.

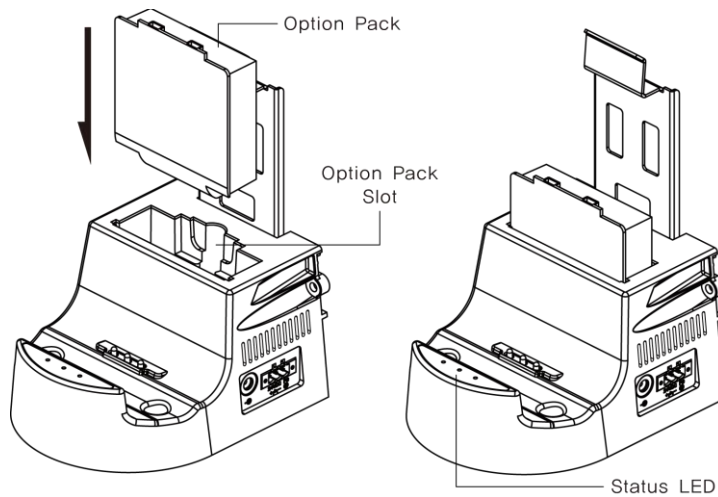


6.3 Body Mount



Place the main body on the cradle so that the handle of the main body enters the mount hook and charging port enters the mount slot.

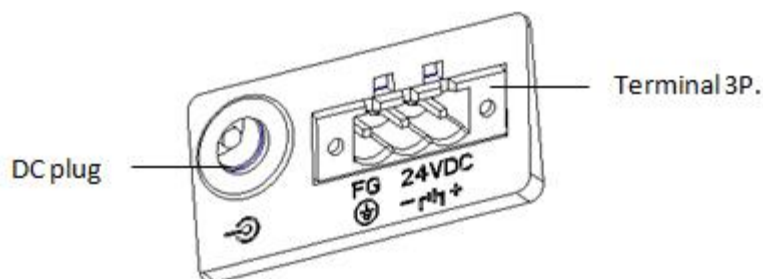
6.4 Auxiliary Battery Charge



- a. Place the auxiliary battery in the Auxiliary battery slot of the cradle.
- b. Confirm the charging state LED according to 4.2.4

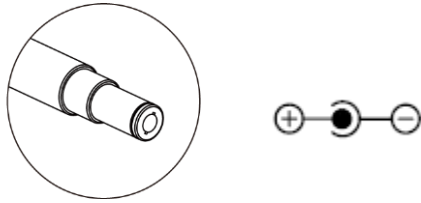
6.5 Cradle Power Wiring

To charge the main battery and the auxiliary battery, the cradle power supply can be powered from the terminal block or the DC plug of the adapter.



- (1) DC Plug

Outer diameter 5.5 x Inner diameter 2.5 mm

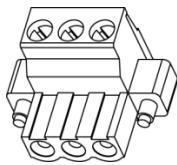


(2) DC Adapter specifications are as follows.

- a. MODEL: ADP-90MD Series
- b. Output Voltage : 19.5V, 4.74A (INCLUDING EMI CORE)

(3) Terminal Wiring

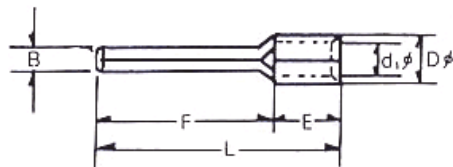
a. The power and ground cable specifications are as follows.



Power cable width	0.75 ~2.5mm ² (18~12AWG)
Ground cable width	Over 4mm ² (11AWG)
Core wire type	Single wire or standard wire
Tightening force of Bolt	≥ 0.2 N.m Warning
Core wire length	

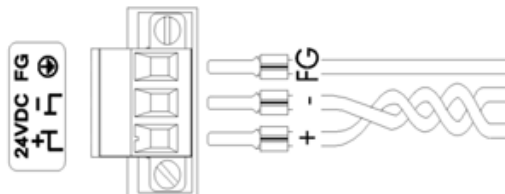
b. Power and ground terminal specifications are as follows.

When installing the power and grounding terminals, use the pin terminals to improve electrical transmission and to prevent the power line wearing.



B	L	F	E	D	d
1.8~2.0	22~18	12~14	5	3.3~3.8	2~2.5

c. Attach the power cord to the power terminal of the body as follows. Warning



6.6 Cradle Ground Wiring Warning

(1) Although the instrument has sufficient noise countermeasures, in order to ensure the safety of the instrument and the safety in use, the user must connect the ground of the instrument.

(2) Grounding should be done with a dedicated ground.

It is recommended that the ground is a 3-class ground. (Ground resistance is 100Ω or less)

(3) When the dedicated grounding is not possible, please make the common ground as shown below.

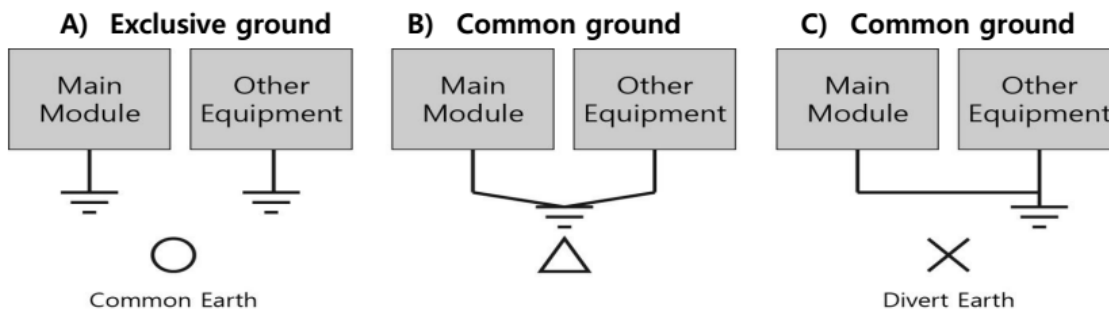


Fig. Grounding Example Diagram

(4) Use a grounding wire of 4mm² or more. Keep the ground wire near the equipment as short as possible.

(5) When DC plug is used, do not connect ground.

Chapter 7. Maintenance Warning

7.1 Cleaning the Display and key pad

When the surface or frame of the display, key pad or shock-absorbing cushion become dirty, spray the cleaning solution onto a soft cloth and wipe the device. Do not spray the cleaning solution directly onto the device

7.2 Battery pack management

(1) Battery storage

- Keep the rechargeable battery at 40 to 60% of capacity to maintain the best operating life.
- It is recommended to store at the optimum temperature of 15 ° C for aging and self-discharge prevention.
- Charge the battery at 40 to 60 percent of its charge every six months.

(2) Battery pack replacement

Replace the auxiliary battery at least once every 5 years.

(3) Battery pack treatment

- Please use the charger of M2I when charging.
- Do not overcharge.
- Do not short-circuit between terminals.
- Do not press it.
- Do not heat.
- Do not disassemble.

7.3 Periodic inspection

For the best condition of this product, periodic inspections are required.

(1) Environment

- Are you operating within the specified temperature range (10 °C to 45 °C)?
- Are you operating within the specified humidity range (10 % to 80 % RH)?
- Is there any corrosive gas around?

(2) Power

Is the input voltage range (-15% ~ + 10%) correct?

(3) Related Topics

- When low voltage warning is displayed on LCD, charge or replace charged battery pack.
- Please check the LCD backlight replacement time with your eyes.
- Make sure that the touchpad is not damaged, scratchy, or dirty.

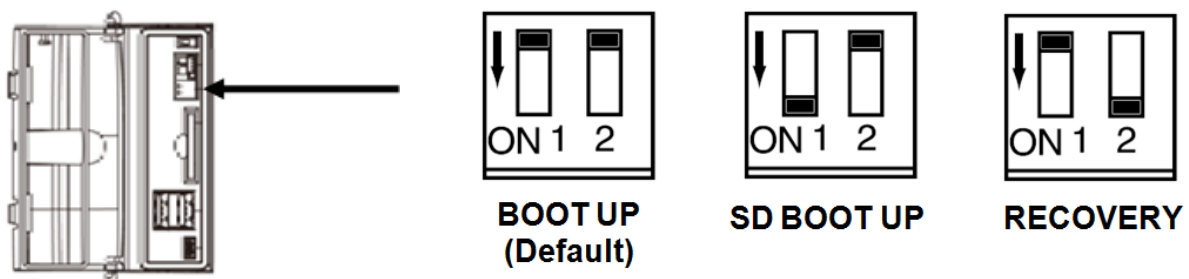
7.4 When a problem occurs with your device Warning

- If any problem occurs during operation, stop using it and please call M2I Corporation A/S department.
- Only authorized workers authorized by M2I Corporation can inspect and repair problems related to malfunction of this equipment.
- If the problem cannot be solved at the installation site, the equipment can be collected and moved to M2I Corporation.
- The manufacturer, M2I Corporation, is not responsible for damage or malfunction of the equipment caused by the use conditions of the user beyond the installation and use standards described in the manual

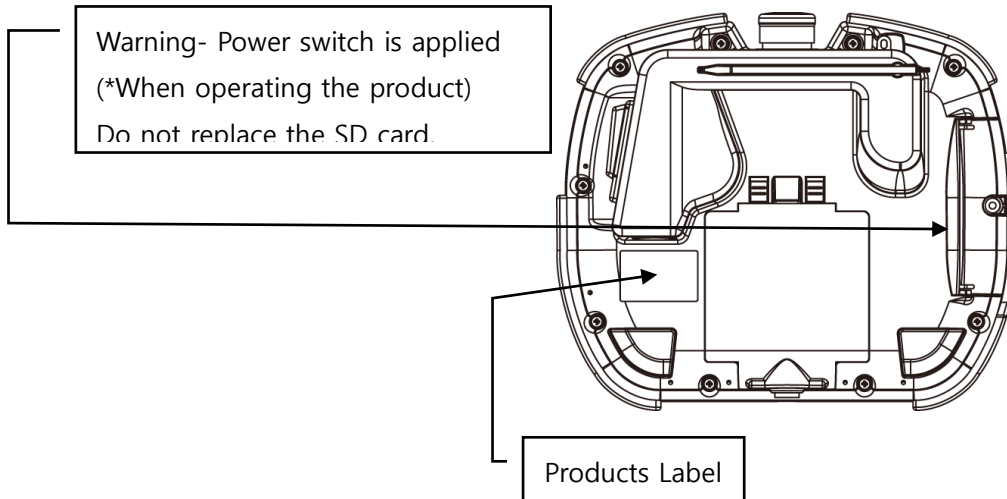
7.4 Setting System Recovery Mode

- If the system fails to boot normally due to a problem during operation, the built-in recovery function can be used to maintain the factory default state. Please note that the built-in project will be deleted when using the recovery mode.
- After opening the rear cover, you can adjust the setting switch.

Keep the "BOOT UP" state when booting normally. If the system is recovering, turn off the power and set it to "RECOVERY".
- When the recovery is completed, the buzzer sounds, then turn off the power and reset to "BOOT UP" state.



Chapter 8. Warning Label



Chapter 9. Products Label

1. Main Body (MODEL: TOPRH0700WD-W)



Manufacturer(AS): M2I Corporation

11-35, Simin-daero 327beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do 14055, Korea

Tel: 82-31-465-3366

Device type: Industrial HMI Touch Panel

Model: **TOPRH0700WD-W**

Operating Temperature: $10\text{ }^{\circ}\text{C} \leq T_a \leq +45\text{ }^{\circ}\text{C}$

Power Specification: 7.26Vdc, 20W or less, Lithium-ion battery pack (MODEL : TOPRH-BAT)

KC Approval Number:

Inner Cell: Model MS920SE (Rechargeable Lithium-ion Cell/Not replaceable)

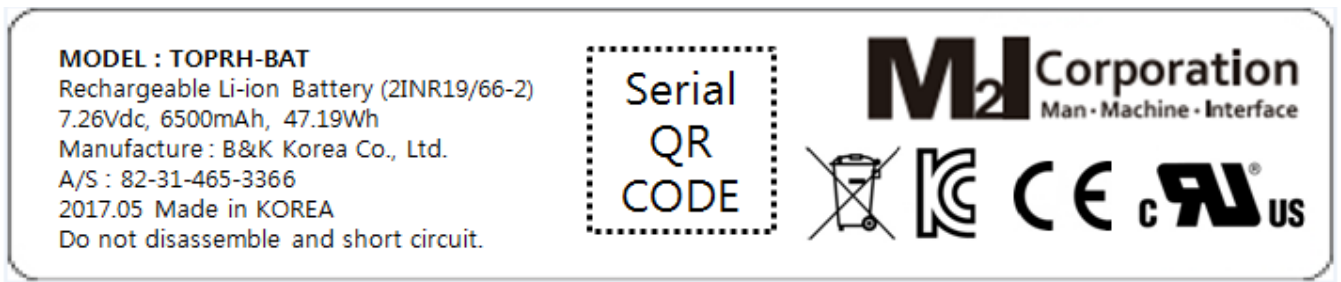
Product number:

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- When using M2I equipment, thoroughly read this datasheet and associated manuals introduced in this datasheet, also pay careful attention to safety and handle the module properly.
- Store this datasheet in a safe place so that you can take it out read it whenever necessary.

2. Battery pack (MODEL: TOPRH-BAT)



3. Charge Cradle (MODEL: TOPRH-CRDL)

