M2I Corporation

Explosion Proof
Wireless Barcode Scanner
MSR-B2MWA-Ex

Hardware Manual

Thank you for purchasing the Explosion Proof Wireless Barcode Scanner of M2I corporation.

Please read this manual carefully to know installing, operating this equipment for safe use of this product.

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Chapter 1 Safety Precautions

■ 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 Precautions

🚫 Do not press the screen with a hard or sharp object (awl, screwdriver, pen) with too strong a force. It may cause malfunction of touch due to damage of the front sheet.

🚫 Do not use or store in an environment with high vibration.

❗ Do not allow foreign objects such as water, liquids, or metal powders to enter the product. This may cause breakage or electric shock.

🚫 Use the radio or mobile phone at least 30cm away from the main unit.

🚫 Do not store or operate in direct sunlight.

🚫 Do not charge or use the battery in explosive environments with flammable liquids, gases, or dust.

🚫 When storing the product for a long time without using the product, store it in a dry environment without direct sunlight. Record/store your data separately. When the product is repaired, the main contents of the device may be deleted.

🚫 Do not let scanner sensor be soiled. It can cause operation problem.

■ Usage Precautions ⚠ Caution

Do not use the product in the location which exceeds allowed temperature. The product can be damaged or shorten the life. Especially Install environment as below should be avoided.

🚫 Operating temperature is -10 ~ 50℃. Do not operate on the surface of control board which high voltage equipment is installed. Safety ambient temperature (Ta) is ≥ 35℃.

🚫 Do not operate in the place where strong shock or vibration continuously have impacted on product.

❗ When leaving for a long time without using the product, charge it and store it at room temperature.

🚫 Indoor use only.

🚫 Operation maximum altitude is up to 2000m.

🚫 This device can be operated in at least one member state without infringing applicable requirements on the use of radio spectrum.

■ Disposal Precautions ⚠ Caution

When you dispose of product, please treat it as industrial waste. It can create poisonous substances or explosion.

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■ A Specification and Precautions for Internal Battery ⚠ Caution

Item	Information
Battery Voltage	DC 3.6V (Secondary Lithium-Ion Battery Pack)
Battery Model Name	FMSS18650 25R 1S1P / Fairman
Battery Lifetime	1 year or mode (under 25℃ circumstance)

🚫 Users cannot replace the internal battery. If there is any problem of battery, replacing or maintenance should be done by manufacturer.

🚫 Charge the product only in safe area without any dangerous factors nearby. Some of chargers are not compatible with the product. Internal battery's using time is reduced as use. About 250 times of full charge and discharge makes 60% of using time.

■ Cautions for safe operation ⚠ Caution

🚫 THIS EQUIPMENT IS SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C AND D OR NON-HAZARDOUS LOCATIONS ONLY.

🚫 Do not replace the battery in explosive area. The internal battery cannot be replaced by users. It should be handled by manufacturer in safe area without affecting anti-explosive structure. Please contact to manufacturer if there is any problem during operation.

🚫 Do not charge the battery or connect data cable in explosive area. A protective cap of charging port and USB-C port must be closed in explosive area. It can be opened only in safe area.

🚫 RISQUE D'EXPLOSION. NE PAS BRANCHER NI DEBRANCHER SOUS TENSION.

🚫 LES BATTERIES NE DOIVENT ETRE REMPLACEES QUE DANS UN EMPLACEMENT EXEMPT DE CONCENTRATIONS

Chapter 2 Overview

2.1 Product Introduction

This Explosion Proof Wireless Barcode Scanner is an industrial control device required in industrial field. It is a device that is used for basic purposes to communicate with other devices (PC, HMI, etc.) using high durability and wireless communication. This product is designed for operation in location with inflammables as flammable gas/steam/liquid.

2.2 Package Contents

The components of the product are as follows.

Before using the product, please check that all of the following components are included.

Item	Figure	Quantity
Product		1
Manual		1
Strap		1

Chapter 3 General Specifications

3.1 Power Specifications

USB-C	DC 5V, 3W
Battery Voltage	DC 3.6V
Power	Cell Type	Lithium - ion (1S1P) Rechargeable battery

USB-C		DC 5V, 3W
Battery Voltage		DC 3.6V
Power	Cell Type	Lithium - ion (1S1P) Rechargeable battery
	Consumption	3.0W less
	Operating time	6 Hours (*Auto-off in Low Voltage)
	Charging time	5 Hours (*from Low Voltage warning to Full Charge)
	Charging Capacity	2500mAh

* The operating time may vary depending on the usage pattern.

** Operating time and charging time are based on 25 ℃ ambient temperature and may vary depending on the ambient temperature.

3.2 Functional Specifications

Sensor resolution & Scan type	640(H) x 400(V), 1D/2D CMOS Barcode
Data storage internal memory	32,768 Code (*GTIN-08 / EAN-8) 24,966 Code (*GTIN-13 / EAN-13) 23,831 Code (*GTIN-14 / ITF-14)
Light Source	Aiming 610nm LED, Illumination 660nm LED
Alarm	Buzzer and LED light
LED indication (White Color)	Power, Bluetooth, Transmission, Battery Status
Action button	Power, Bluetooth, Transmission, Scan

3.3 Interface Information

Bluetooth	Spectrum Band	2400 ~ 2483.5Mhz
	Standard	Bluetooth® 5.2 Low Energy (BLE)
	Transmit Speed	1Mbps@Typ
	Maximum Power	+8.22dBm (Including Antenna gain)
	Receiver Sensitivity	-96dBm@Typ
	Operation Area	5M or more (*flat-ground communication)
	Security	AES-128bit and AES-256bit
IrDA		Compliant to IrDA physical layer standard up to 115.2kbit/s (SIR), More than 0.5M in open space *Dedicated use of M2I HMI equipment
USB		USB C Type. DC 5V, 3W. Data Communication only for Maintenance
Station terminal		

WARNING - EXPLOSION HAZARD – BATTERIES AND STATION TERMINAL MUST ONLY BE CHANGED AND CHARGED IN AN AREA KNOWN TO BE NON-HAZARDOUS.

3.4 Antenna Information

Antenna Model Name	ALA321C3
Gain	Peak gain +4.36dBi
Antenna Type	Internal Antenna
Manufacturer	AMOTECH Co., Ltd

3.5 Environment Specifications

Operation Temperature (℃)	-10 ~ +50
Storage Temperature (℃)	-20 ~ +60

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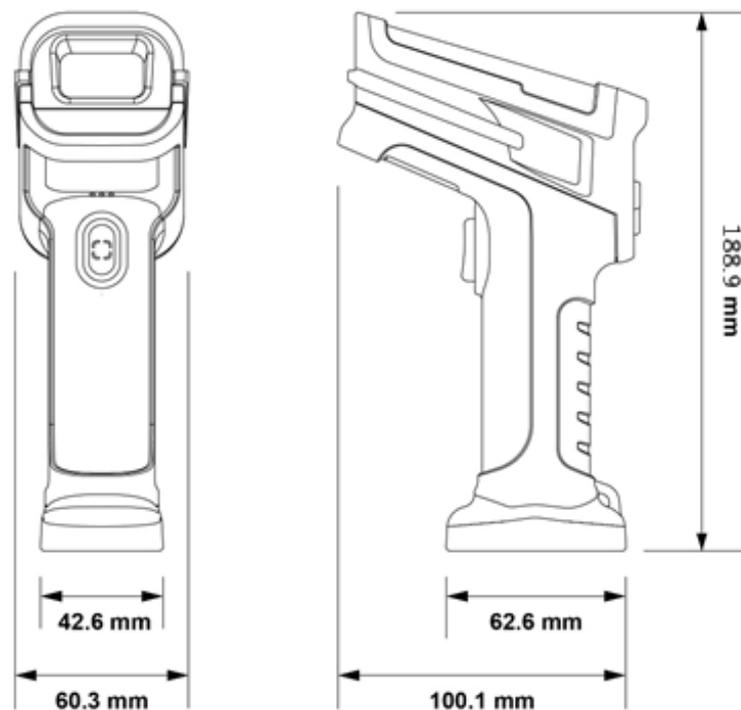
Operation Humidity (%RH)	0 ~ 90 (No dew)
Atmosphere	No corrosive gas
Vibration Endurance	Amplitude: 10≤F < 25Hz(2G) X,Y,Z each direction(for 30 minutes)
Noise Immunity	1000Vp-p(Pulse width 1μs)
Static Electricity Discharge	Connective discharge from EN61000-4-2: ±4kV
Impact Immunity	10G X,Y,Z Each Direction(3 times)
BARCODE LED Classification	Exempt Risk Group LED product per IEC/EN 62471
IP	IP66
Explosion Proof Structure	KCs: Ex ib IIC T4 Gb, Zone1 UL/cUL: Class I, Group ABCD, Division 2
Safety ambient temperature (Ta)	Ta ≥ 35℃

3.6 Structure Specifications

Weight(g)	416
Cooling System	Natural air circulation
Case Material	PC(Flame Retardant) and Urethane

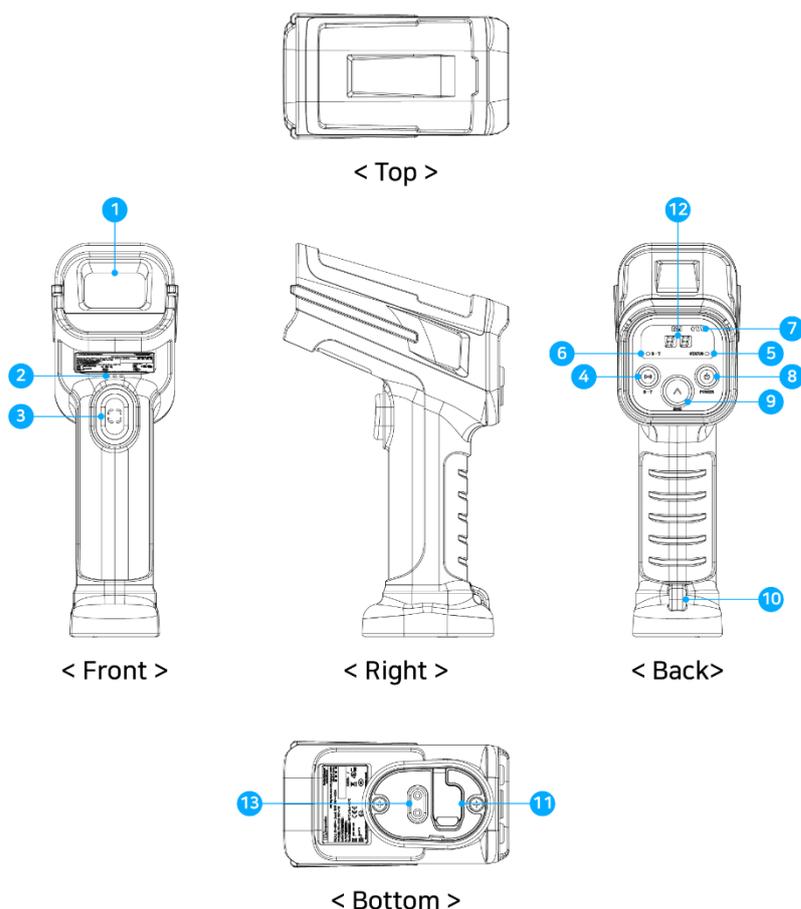# Chapter 4 Part Names and General Specifications

4.1 Dimension

(mm)

Model Name	W	D	H
MSR-B2MWA-Ex	100.1	60.3	188.9

4.2 Part Names and Specifications

< Top >

< Front >   < Right >   < Back>

< Bottom >

No.	Item	Description
①	Scanner window and IrDA	Barcode SCAN , IrDA Send/Receive
②	Buzzer hall	Buzzer sound
③	SCAN Switch	SCAN Switch
④	Bluetooth Switch	Connect / Disconnect of Bluetooth
⑤	Status Indicator	Status of Data Transmission
⑥	Bluetooth Indicator	Status of Bluetooth Connection
⑦	Battery Indicator	Battery Remains (3 Levels)
⑧	Power Switch	Power ON, OFF
⑨	SEND Switch	IrDA Data Transmission
⑩	Strap Hall	Strap Holding
⑪	Protective Cap	Cover for USB Charging Port
⑫	Scan data count Indicator	The number of Barcode scan data
*⑬	Station terminal	Battery charging terminal

*⑬ Station terminal only in safe area.

🚫A protective cap of charging port and USB-C port must be closed in explosive area. It can be opened only in safe area.
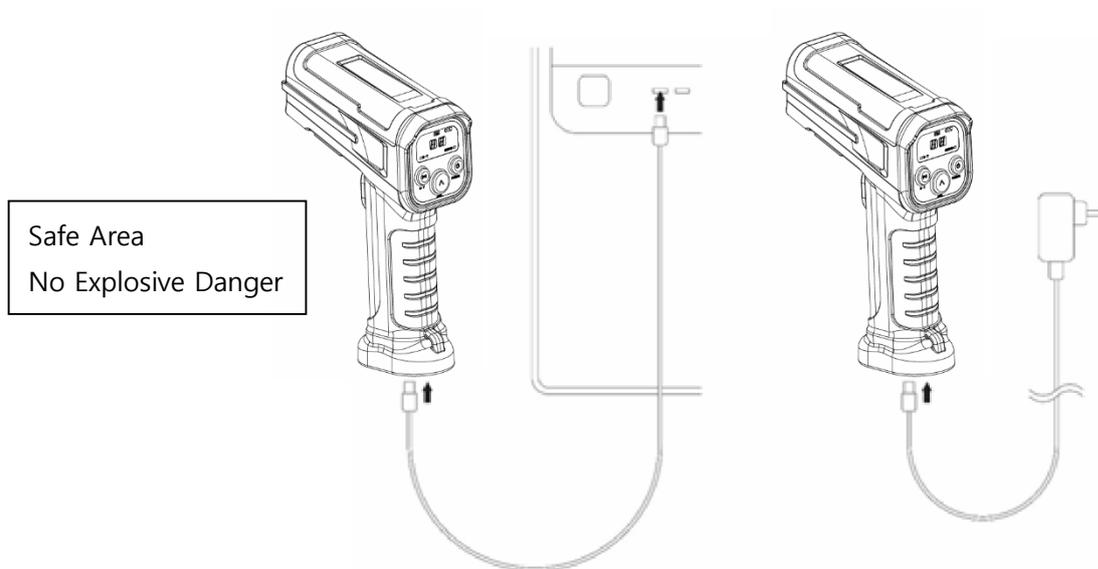
Chapter 5 Battery Charging ⚠Warning

5.1 Location Select

(1) Safe without any explosive dangers

(2) Operation-Guaranteed

(3) Easy to Connect/Disconnect for Cables
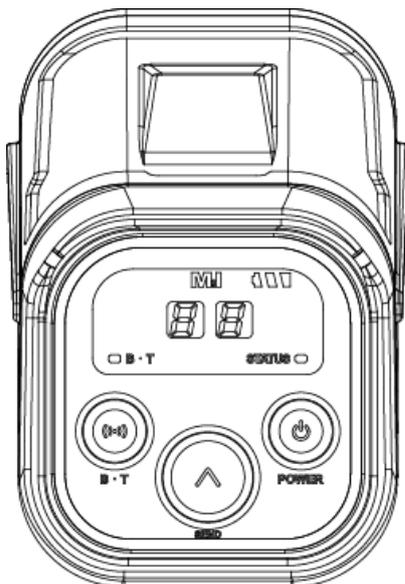
(4) No Direct Sunlight

5.2 Charging Battery

(1) Connect the bottom side charging port with USB-C Type cable for charging.

(2) Charging must be done in safe area without any explosive dangers.

Safe Area
No Explosive Danger

🚫 Do not charge the battery or connect data cable in explosive area.

  * This product does not support a quick charge and some of chargers are not compatible with the product.

❗ Use LPS or PS2 power supply adapter for the lowered risk of fire or electrocution in charging.

  * LPS(Limited Power Source), PS2(Power source class 2)

Chapter 6 Device operating and display
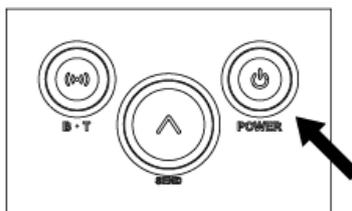
6.1 Default Status

6.2 LED Indicators

LED	LED Status	Description
B.T	ON	Bluetooth not used, IrDA use
	BLINK	Device register request of Bluetooth pairing
	OFF	Bluetooth connected
STATUS	OFF	Normal operation
	ON	IrDA/Bluetooth data transmission failed
BATTERY	Level OFF	Battery discharge for each level
	Level ON	Battery remains for each level
	Level BLINK	Charging

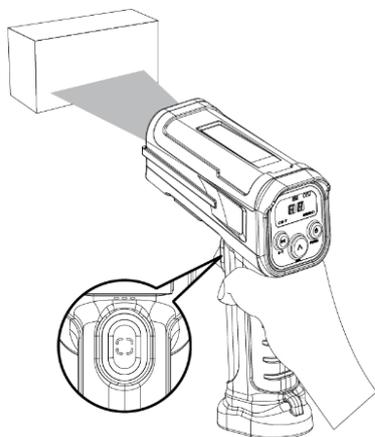## 6.3 Operation and Switch

6.3.1 Power ON/OFF: POWER Switch

Hold to push the "POWER" button in 2 seconds for Power on. Another 2 seconds push makes the product power-off. The power becomes off automatically when it takes 10 minutes without any operation.

6.3.2 Barcode Scan: Scan Switch

A scan mode is activated when [SCAN] button is pushed, and the product reads barcode in scan mode. When a reading is done, scan mode is end with buzzer sound.
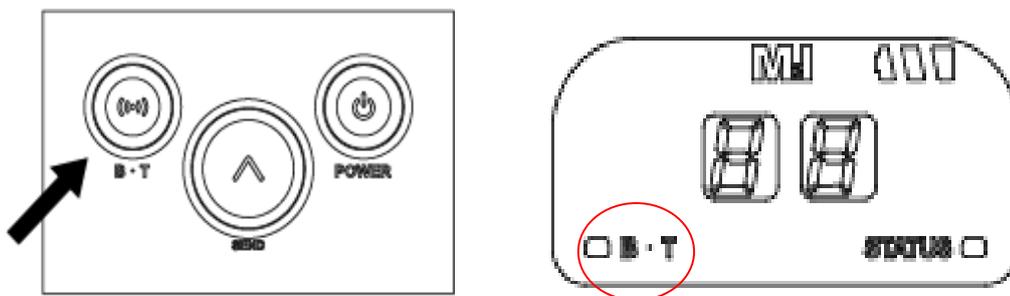
If the product is connected by Bluetooth, scanned data is transmitted automatically and saved into internal memory. The data is saved into internal memory if it is not connected. (maximum 10 data, in sequence)

Both Explosive area and Safe area

🚫 Do not aim the scanner sensor to humans or animals when you scan. It can damage to their retina or cause amblyopia. An optimal distance and minimum resolution is as below. ⚠️ **Caution**
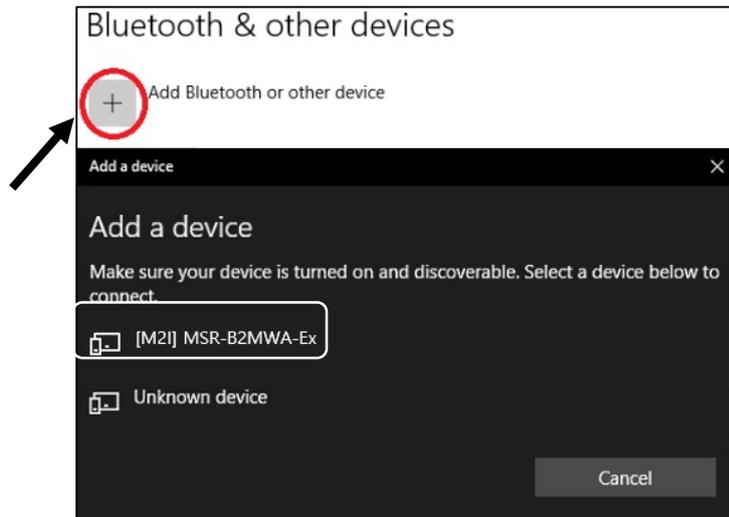
Symbology	Resolution	Near	Far
Code 39	0.127 mm	5.1 cm	16.2 cm
Code 39	0.508 mm	5.0 cm	49.5 cm
Code 128	0.127 mm	6.3 cm	12.7 cm
PDF417	0.167 mm	6.3 cm	16.0 cm
PDF417	0.254 mm	4.5 cm	22.8 cm
100% UPC	0.330 mm	5.0 cm	31.7 cm
Data Matrix	0.508 mm	3.8 cm	34.3 cm
QR Code	0.508 mm	3.8 cm	27.9 cm

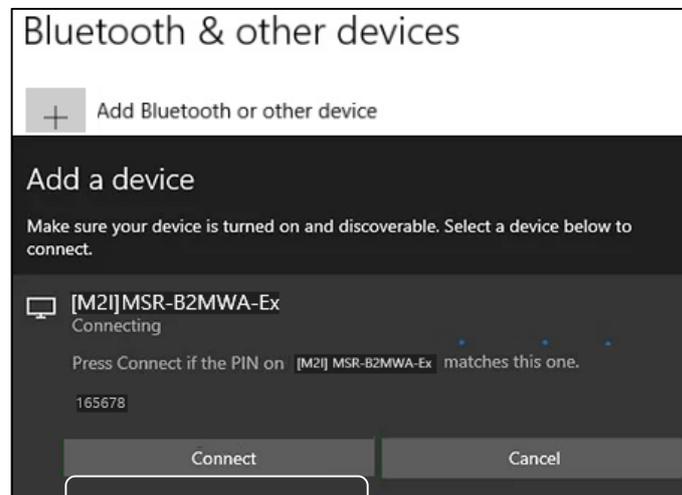6.3.3 Bluetooth Data Transmission: Bluetooth Switch

(1) Bluetooth Pairing

a. When you hold to push Bluetooth switch for 2 seconds, a B.T LED will blink with buzzer sound.

b. Check "[M2I] MAR-B2MWA-Ex" in accessible device list of Bluetooth device.

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c. Please select 'Link' in the Bluetooth device list.

d. If it is connected well, B.T LED will be ON with a buzzer sound.

e. The product can register maximum 128 device. Device registered first will be deleted when registered devices are more than 128ea.

(2) Bluetooth Data Transmission

a. Launch [Text Input Program] Bluetooth connected device and it is recommended to set a language of program as English.

b. Check the scanned data is input well in the [Text Input Program].

(3) Bluetooth Disconnection

a. Push Bluetooth switch for 2 seconds to disconnect.

b. B.T LED will blink with a buzzer sound.

c. A scanner mode will be changed into IrDA mode.

(4) Deleting all of Registered Bluetooth Devices.

a. Push the Bluetooth switch for 10 seconds, and all of registered devices are deleted.
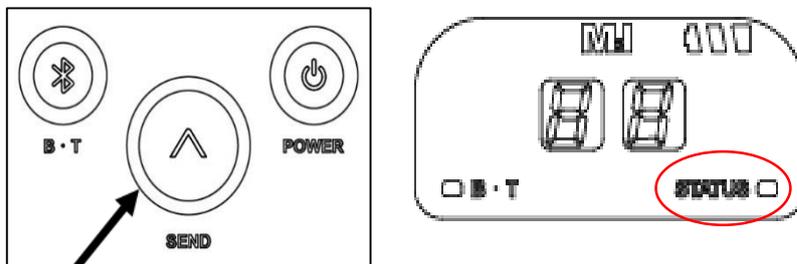
b. A buzzer sound occurs once and B.T LED turns OFF.

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(5) Bluetooth Automatic Re-connection

If a device is registered(paired) as (1), it will be re-connected automatically when the Bluetooth is ON of the product, even the product's power is OFF and ON again.

6.3.4 IrDA Data Transmission (M2I HMI Model Dedicated)

If the product is turn on, it turns to [IrDA Data Transmission Mode] automatically.

(1) Scan by pushing Scan Switch.

(2) If keep the product towards the IrDA receiver of M2I HMI and push [SEND] button, data will be sent as below description.

- Push [SEND] button 3 seconds: Sending all saved data (maximum 10) in the product.
- Push [SEND] button under 3 seconds: Sending a firstly saved data.

(3) If the data is transmitted well, there will be a buzzer sound.

(4) If the data is transmitted failed, [STATUS LED] will turn ON with a buzzer sound.
The failed data will be remained, and if the re-try for transmission is done well, [STATUS LED] will turn OFF.

(5) Maximum 3 barcode data can be transmitted in forward order to M2I HMI, by press [SEND] button briefly and sequentially.

Chapter 7 Maintenance ⚠Warning

7.1 Cleaning the Display

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.
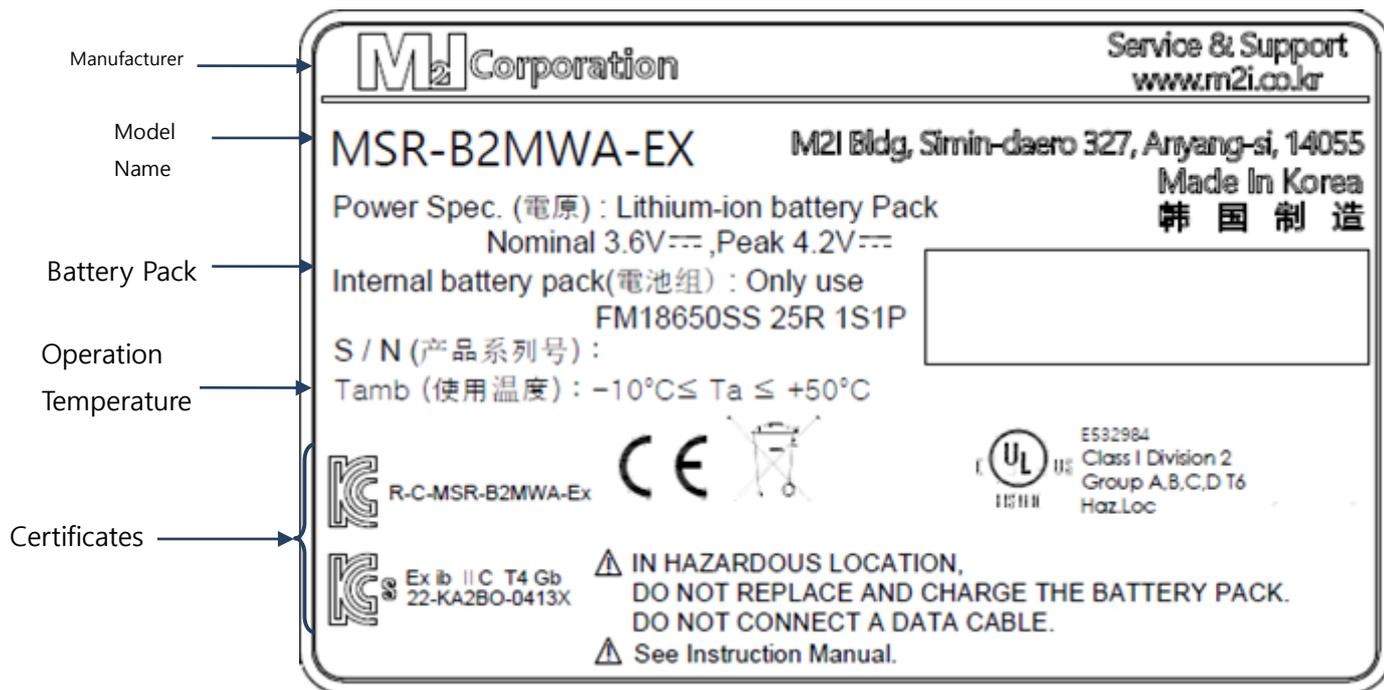
7.2 Periodic inspection

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

(1) Are you operating within the specified temperature range(-10~50℃)?
(2) Are you operating within the specified humidity range(10~90%RH)?
(3) Is there any corrosive gas around?
(4) Please check the display crack or pollution with your eyes.

7.3 When a problem occurs to your device ⚠Warning

(1) If any problem occurs during operation, stop using it and please call M2I Corporation A/S department.
(2) Only authorized workers authorized by M2I Corporation can inspect and repair problems related to malfunction of this equipment.
(3) If the problem cannot be solved at the installation site, the equipment can be collected and moved to M2I Corporation.
(4) 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.
(5) The longer the battery use, the lower the performance, resulting in less battery life. If the operation time of the device is reduced too much, please contact A/S department of M2I Corporation.
(6) User cannot replace the internal battery.
(7) If you power on as pushing Bluetooth switch and SEND switch same time, the product goes to manufacturer manage mode and it will not work. Then please power on again.

Chapter 8 Product Label

Manufacturer ⟶

Model Name ⟶

Battery Pack ⟶

Operation Temperature ⟶

Certificates ⟶

M2I Corporation

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MSR-B2MWA-EX

M2I Bldg, Simin-daero 327, Anyang-si, 14055
Made In Korea
韓 国 制 造

Power Spec. (電原) : Lithium-ion battery Pack
Nominal 3.6V⎓ ,Peak 4.2V⎓
Internal battery pack(電池组) : Only use
FM18650SS 25R 1S1P
S / N (产品系列号) :
Tamb (使用温度) : −10°C≤ Ta ≤ +50°C

KC R-C-MSR-B2MWA-Ex   CE

KC Ex ib ⅡC T4 Gb
22-KA2BO-0413X

E532984
(UL) Class I Division 2
Group A,B,C,D T6
Haz.Loc

⚠ IN HAZARDOUS LOCATION,
DO NOT REPLACE AND CHARGE THE BATTERY PACK.
DO NOT CONNECT A DATA CABLE.
⚠ See Instruction Manual.

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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.**