M2I Corporation

Anti-Explosive Wireless Barcode Scanner
MSR-B2MWA-Ex

Hardware Manual

Thank you for purchasing the Anti-Explosive Wireless Barcode Scanner of M2I corporation.
Please read this manual carefully to know installing, operating this equipment for safe use of this product.

The product described in this manual, MSR-B2MWA-Ex, is manufactured following Article 84 (Safety Certification) of Occupational Safety and Health Act, and Article 110 (Types and Methods of Safety Certification Examination) of Enforcement Rules of the Occupational Safety and Health Act.

Index

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.

🚫 Do not operate product to the place which the ambient temperature is out of limits, from 10℃ to 45℃ or on the surface of control board which high voltage equipment is installed.

🚫 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.

■ Disposal Precautions ⚠ Caution

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

■ 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**

🚫 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.

Chapter 2 Overview
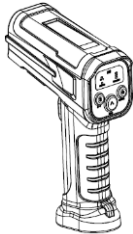
2.1 Product Introduction

This Anti-Explosive 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

Rated Input Voltage (Vin)		DC 5V
Battery Voltage Range		DC 3.2V ~ 4.2V (Standard: 3.6V)
Power	Cell Type	Lithium - ion (1S1P) 2차 전지
	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	Spetrum Band	2402 Mhz ~ 2480 Mhz
	Standard	Bluetooth® 5.2 Low Energy (BLE)
	Transmit Speed	1Mbps@Typ
	Transmit Power	+8.3 dBm (Including Antenna)
	Receiver Sensivity	-96 dBm@Typ
	Operation Area	5M or more (*flat-ground communication)
	Security	AES-128bit and AES-256bit
IrDA	IrDA physical layer standard, 115.2 kbit/s(SIR), 0.5m or more @ Open Space, Dedicated communication for HMI TOPRD□□30□	
USB	USB C Type. Battery Charging Only. Data Communication only for Maintenance	

3.4 Antenna Information

Antenna Model Name	ALA321C3
Gain	Typ. +2.3 dBi
Antenna Type	Internal Antenna
Manufacturer	AMOTECH Co., Ltd

3.5 Environment Specifications

Operation Temperature (℃)	-10 ~ +50
Storage Temperature (℃)	-20 ~ +60
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
Anti-explosive Structure	Ex ib IIC T4 Gb

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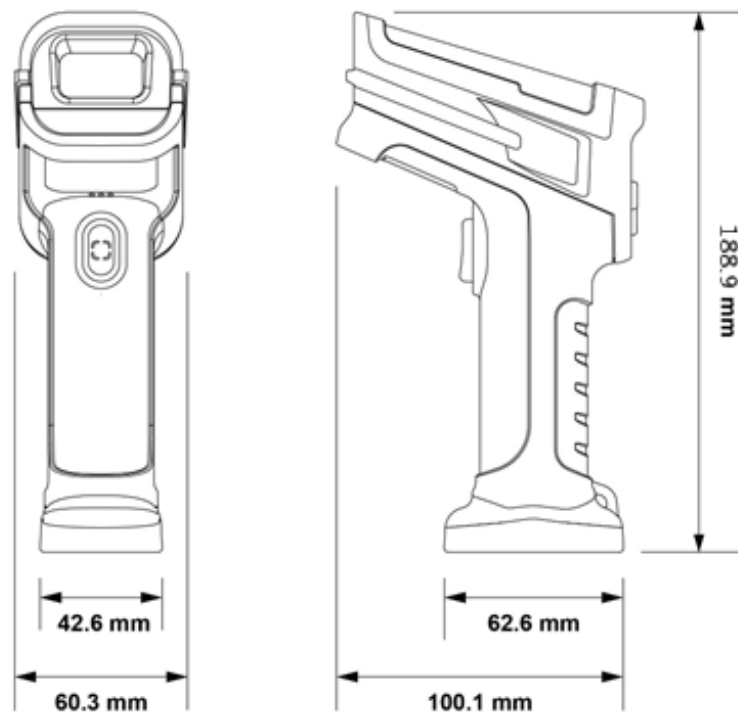
Model Name	W (mm)	D (mm)	H (mm)
MSR-B2MWA-Ex	100.1 mm	60.3 mm	188.9 mm

4.2 Part Names and Specifications
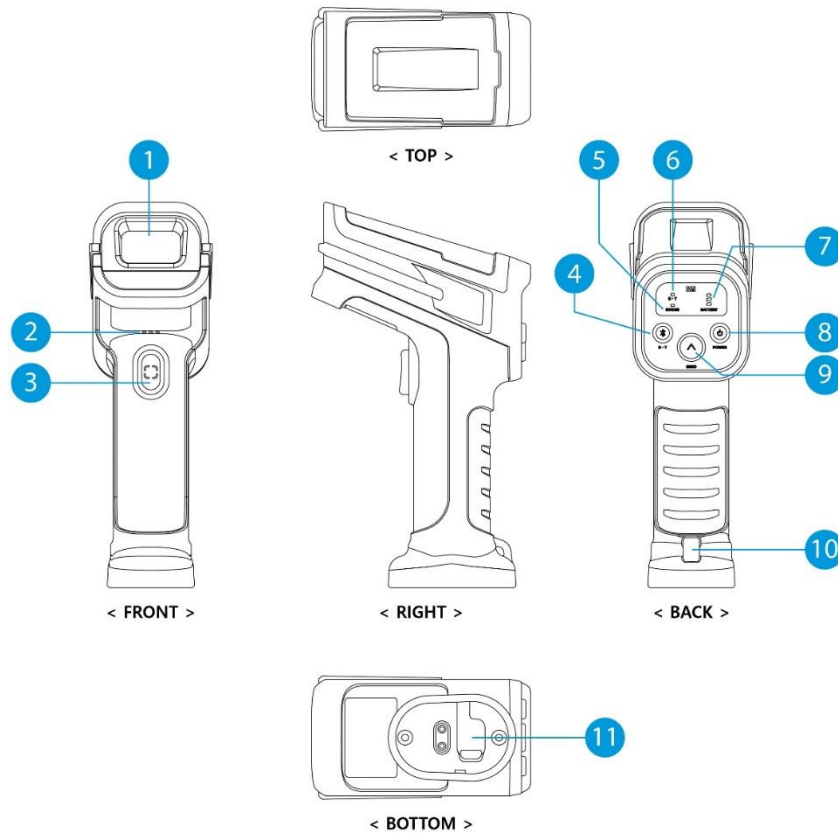
No.	Item	Description
①	Scanner window and IrDA	Barcode SCAN , IrDA Send/Receive
②	Buzzer hall	Buzzer sound
③	SCAN Switch	SCAN Switch
④	Bluetooth Switch	Connect / Disconnect of Bluetooth
⑤	Status Indicator	Status of Data Transmission
⑥	Bluetooth Indicator	Status of Bluetooth Connection
⑦	Battery Indicator	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

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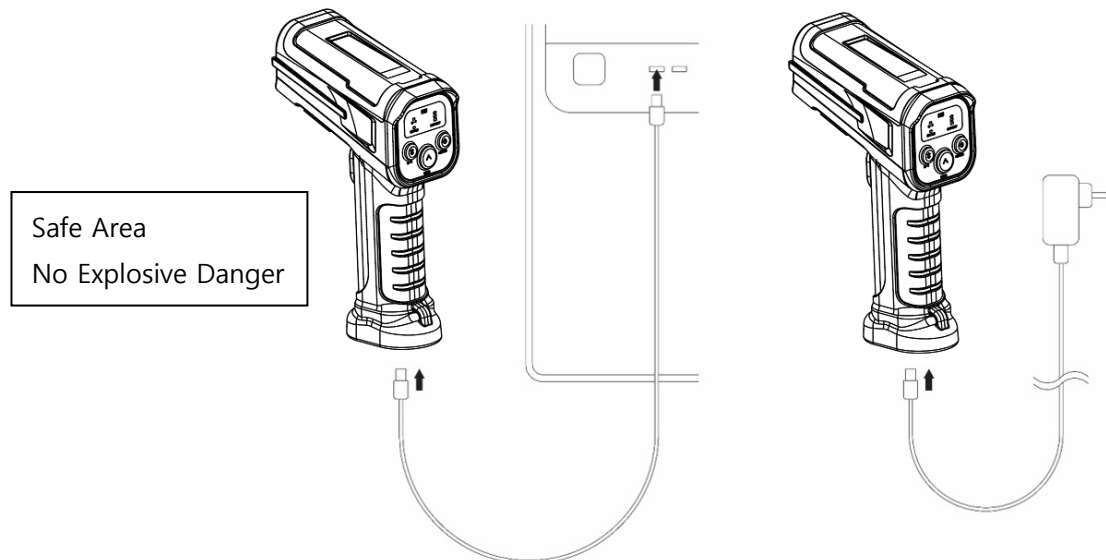
🚫 Do not charge the battery or connect data cable in explosive area.

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

Chapter 6 Device operating and display

6.1 Default Status
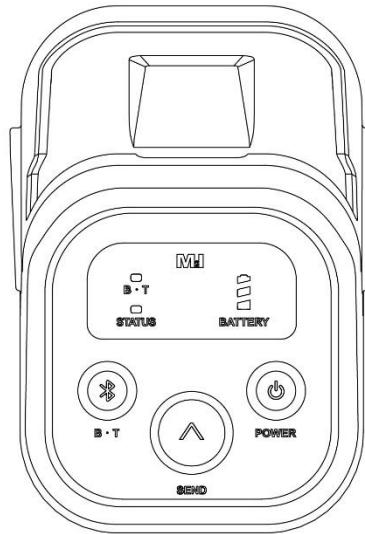
6.2 LED Indicators

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 3 seconds for Power on. Another 3 seconds push makes the product power-off. The power becomes off automatically when it takes 10 minutes without any operation.

11-35, Simin-daero 327beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14055 , Republic of Korea
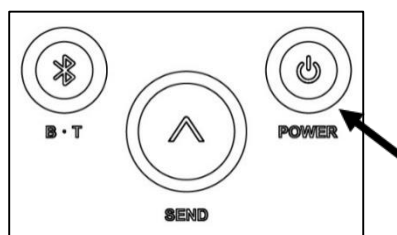
6.3.2 Barcode Scan: Scan Switch

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 3 data, in sequence)
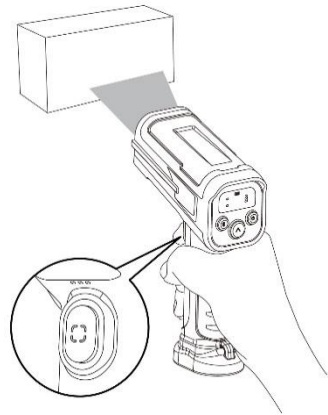

Both Explosive area and Safe area

🚫 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
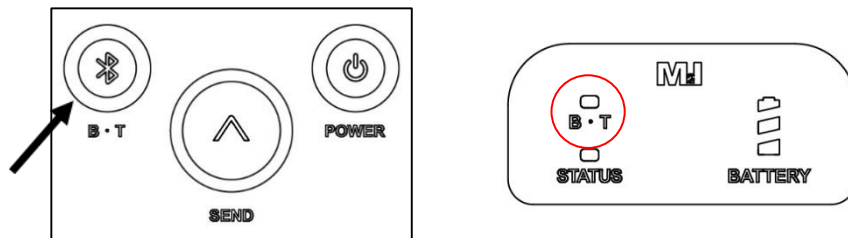
(1) Bluetooth Pairing

a. When you hold to push Bluetooth switch for 3 seconds, a B.T LED will blink with buzzer sound.

b. Check [M2I Barcode Scanner] in accessible device list of Bluetooth device.
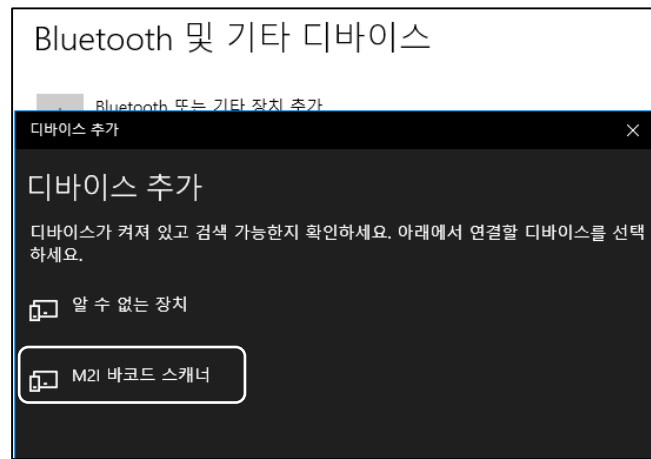
c. Please select 'Link' in the Bluetooth device list.

d. Push Bluetooth switch.

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

f. 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 3 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 7 seconds, and all of registered devices are deleted.

b. A buzzer sound occurs once and B.T LED turns OFF.

(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 TOPRD□□30□ Model Dedicated)

If the product is turn on, it turns to [IrDA Data Transmission Mode] automatically.
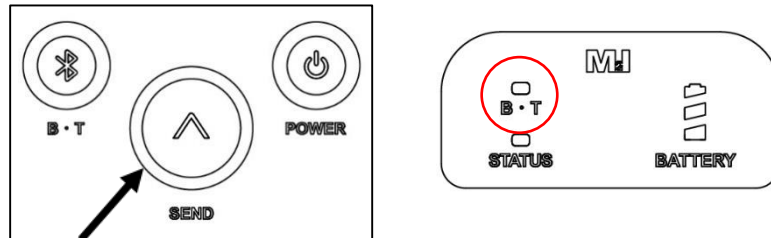
(1) Scan by pushing Scan Switch.

(2) If keep the product towards the IrDA receiver of TOPRD□□30□(M2I HMI) and push [SEND] button, data will be sent as below description.

- Push [SEND] button 3 seconds: Sending all saved data (maximum 3) in the product.
- Push [SEND] button less than 3 seconds: Sending a firstly saved data.
- Push [SEND] button 7 seconds: Deleting all saved data (maximum 3) in the product.

(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 TOPRD□□30□(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 °C to 50 °C)?

(2) Are you operating within the specified humidity range (10 % to 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 Number

Manufacture (AS): M2I Corporation

11-35, Simin-daero 327beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14055 , Republic of Korea
Tel: 82-31-465-3366

Device type : Explosion Proof Wireless Barcode Scanner

Protection Level : IP66

KC Approval Number:

Serial number :

Copyright: M2I Corporation   2022.08   **www.m2i.co.kr**

Doc.No.: MSR-D0002 Rev.0

- **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.**

This product is an industrial device for manufacturing process, which has a certified from 2, Article 58, of the
Wireless Telegraphy Act.