M2I Corporation

Explosion proof Bluetooth dongle MWD-BTR100-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.

Index

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Chapter 1 Safety precautions

■ Before using the product

To ensure the safe and efficient use of the product, please read this manual thoroughly and completely before use. The safety precautions must be followed to prevent accidents and hazards. These precautions are divided into "Warning" and "Caution" sections. The meanings of each category are as follows.

⚠ 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.

■ Explosion-proof (Ex) Related Precautions

⊘ Do not open the product when there is a possibility of explosive gas.

⊘ Do not connect or disconnect any cables that can be connected to the device while power is supplied (during product operation).

■ General Precautions ⚠ Caution

⊘ Do not press the screen with hard or sharp objects (such as an awl, screwdriver, pen, etc.) or apply excessive force. This may cause damage to the front sheet and result in touch malfunctions.

⊘ Do not use or store the product in environments with heavy vibrations.

❗ Be cautious to prevent water, liquids, metal dust, or other foreign substances from entering the product. This could cause damage or electrical shock.

⊘ Keep walkie-talkies or mobile phones at least 30 cm away from the main body.

⊘ Do not store or operate the product in direct sunlight. Direct sunlight may alter the properties of the LCD.

⊘ 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 contaminate the scanner window of the device. Contamination may cause operational issues.

■ Precautions for Safe Operation ⚠ Caution

⊘ Use the equipment only in locations with an overvoltage category of 2 or higher as defined in KS C IEC 60664-1.

⊘ The equipment shall be installed in a rear enclosure with tool-removable doors or covers providing a protection rating of IP54 or higher according to KS C IEC 60079-0.

⊘ Install the equipment only in locations with a low risk of mechanical damage.

⊘ Do not insert or remove external connections for equipment with a front USB port unless the area where the equipment is installed is known to be non-hazardous or the power to the connected circuit is turned off.

⊘ Secure external connections to the equipment using the mechanical fastening devices provided with the product to prevent unintended disconnection.

⊘ Transient protection must be provided at the power terminals of the device, set at a level not exceeding 140%

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of the peak rated voltage.

⃠ If installed in a pressure explosion-proof (Ex pz) panel with an IP4X rating or higher, use a circuit configuration that prevents power from being applied before purging is complete.

■ Usage Precautions ⚠ Caution

⃠ Do not install the product in locations where the temperature exceeds the allowable range, as this may cause damage to the unit or reduce its lifespan.

⃠ Do not install the product in the following environments:

- Locations where the ambient temperature is outside the range of -10 ~ 50°C
- Surfaces of control panels where high-voltage equipment is installed

⃠ Do not install the unit in areas subject to continuous strong shock or vibration.

❗ When the product will not be used for an extended period, charge it fully and store it at room temperature.

⃠ Use only indoors.

⃠ Use only at altitudes of 2,000 meters (6,561 feet) or lower.

■ Disposal Precautions ⚠ Caution

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

Chapter 2 Overview

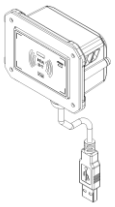
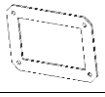
2.1 Product introduction

This explosion-proof Bluetooth dongle (MWD-BTR100-Ex) is an industrial device required for industrial sites. Its primary purpose is to communicate with our barcode scanner (MSR-B2MWA) using Bluetooth and IrDA communication, and to transmit barcode data to other devices (PCs, HMIs, etc.). This device is designed for use in locations where flammable substances such as flammable gases, vapors, and liquids may be present in normal operating environments.

2.2 Components

The components of the product are as follows.

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

Components	Figure	Quantity
Main Body (MWD-BTR100-Ex)		1
Manual		1
Gasket		1
Screws		4

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Chapter 3 General specifications

3.1 Power Specifications

Power	Category	USB Type A DC 5V
	Power Consumption	0.5W

3.2 Functional Specifications and Display

LED Indicator (Red/Green)	USB Connection Mode Status

3.3 External Communication Information

Bluetooth	Frequency Band	2402 ~ 2480MHz
	Standard	Bluetooth® 5.0 Low Energy (BLE)
	Data rate	1Mbps@Typ
	Maximum Output	+0.55dBm (including antenna)
	Operating Range	Within 5m (*flat terrain communication)
	Security	WEP(64/128), WPA-PSK+(TKIP, AES), WPA2-PSK+(TKIP, AES) *AES Recommended
IrDA	Complies with IrDA physical layer specification, 115.2kbit/s (SIR), 0.7M in open space communication, proprietary communication for our HMI	
USB	USB Type A, for data communication and power supply, cable length 1m	

* Reliability is not guaranteed for extension cables in addition to the supplied cable.

3.4 Environmental Specifications

Ambient operating temperature (℃)	-10 ~ +50
Storage Ambient Temperature (℃)	-20 ~ +60
Operating ambient humidity (%RH)	0 ~ 90 (Non-condensing)
Corrosive Gas	There shall be no corrosive gas.
Anti-vibration	Amplitude: 10 ≤ F < 25 Hz (2G) in each of X, Y, Z directions (30 minutes)
Noise Reduction	1000Vp-p (pulse width 1 μs)
Electrostatic Discharge	Contact discharge by EN61000-4-2 standard: ±4kV
Shock Resistance	10G X, Y, Z each direction (3 times)
IP	Front IP54
Explosion-proof construction	Ex ec IIC T6
Safe ambient temperature (Tma)	Tma ≥ 35℃

3.5 Structural Specifications

Weight (g)	110g
Cooling Method	Natural Air Cooling
Exterior Material	PC (Flame Retardant)

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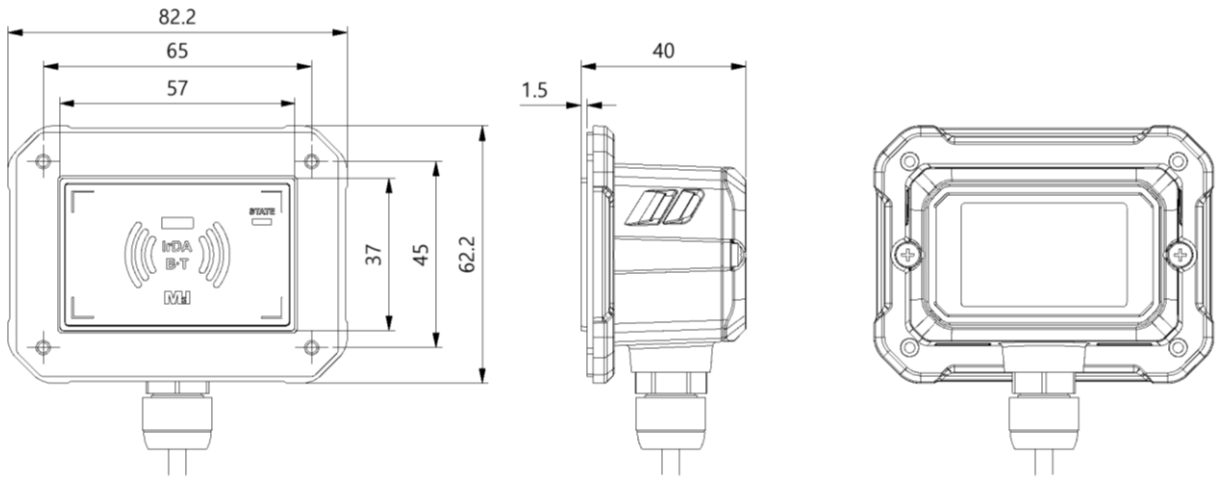
Chapter 4 Part Names and Detailed Specifications

4.1 Product Dimensions



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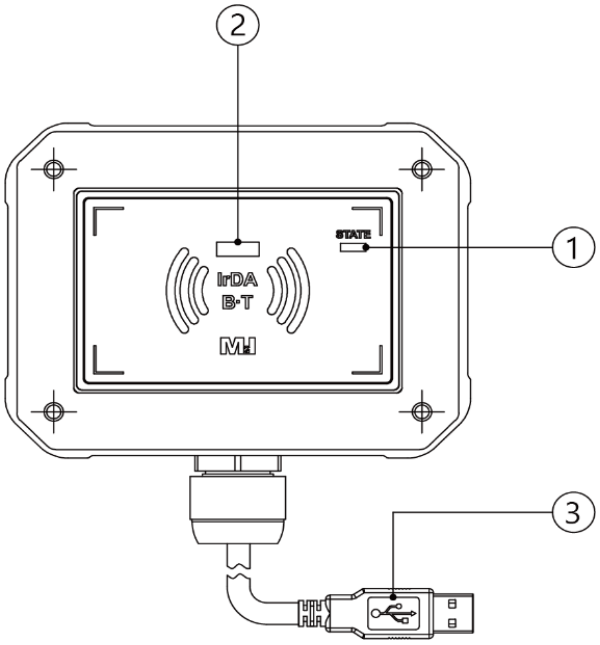
Model Name	W	D	H
MWD-BTR100-Ex	82.2	40	62.2

* USB2.0 Cable Length: 1m

4.2 Part Names and General Specifications



Number	Name	Explanation
①	LED	USB Connection Mode Status (Red: HID Interface / Green: Serial Interface)
②	IrDA Sensor	Receive data from the IrDA transmitter of the barcode scanner
③	USB 2.0	Transmit data received through the barcode scanner to the connected device.

Chapter 5 Operation and Display

5.1 LED Indicator

LED Status	Description
Red	HID Interface
Green	Serial Interface

5.2 Operation Example

5.2.1 Power On and Off

The product power turns on when connected to the USB port of a device (PC, HMI, etc.) that desires barcode data transmission.

5.2.2 USB Interface Method Setting

The MWD-BTR100-Ex product supports two USB interfaces: USB HID and USB Serial. The default setting is USB HID. Use USB Serial mode only when communicating with our HMI.

The USB interface automatically enters Setup mode by scanning the barcode provided in '5.3 USB Specification Settings' using our barcode scanner product. The scanned data is transmitted to the MWD-BTR100-Ex product, allowing for free interface changes. Changing the USB interface takes approximately 3 to 5 seconds.

5.2.3 Data Communication

The MWD-BTR100-Ex product supports two communication methods: IrDA and Bluetooth.

5.2.3.1 IrDA Communication

IrDA communication is supported by our barcode scanner series, MSR-B2MWA(B) and MSR-B2MWA-Ex products.

a. Scan and save barcodes using our barcode scanner product.
b. Press the SEND button on the barcode scanner product to transmit data.
c. Receives data from the MWD-BTR100-Ex product.
d. The barcode data is transmitted to connected devices such as PCs and HMIs using the configured USB interface method.

5.2.3.2 Bluetooth Communication

Bluetooth communication is supported by MSR-B2MWA-Ex products only.

(1) Bluetooth Pairing

a. When the B.T button of the MSR-B2MWA-Ex product is pressed for more than 2 seconds, the white LED will flash.

b. Search for devices in the MWD-BTR100-EX product, identify the MSR-B2MWA-Ex product, and connect.

c. If Bluetooth communication is connected normally, the buzzer of the MSR-B2MWA-Ex product will sound once and the B.T LED will illuminate.

(2) Bluetooth Data Transmission

When scanning a barcode with the MSR-B2MWA-Ex product, data is transmitted to the MWD-BTR100-Ex.

b. After receiving data from the MWD-BTR100-EX product, data is output via USB HID or USB Serial.

(3) Bluetooth Disconnection

a. Pressing the B.T button of the MSR-B2MWA-Ex product for more than 2 seconds will disconnect the Bluetooth connection.

b. The MSR-B2MWA-Ex product will be switched to IrDA communication mode, which is the default operating state.

5.3 USB Specification Settings

Set the USB data format in Bluetooth or IrDA communication status with our explosion-proof barcode scanner (MSR-B2MWA-Ex).

5.3.1 USB HID Mode

The data is output in the standard USB HID keyboard format.

5.3.2 USB Serial Mode

The device communicates using USB Serial format and enhances data reliability through our proprietary protocol. (Proprietary to our HMI)

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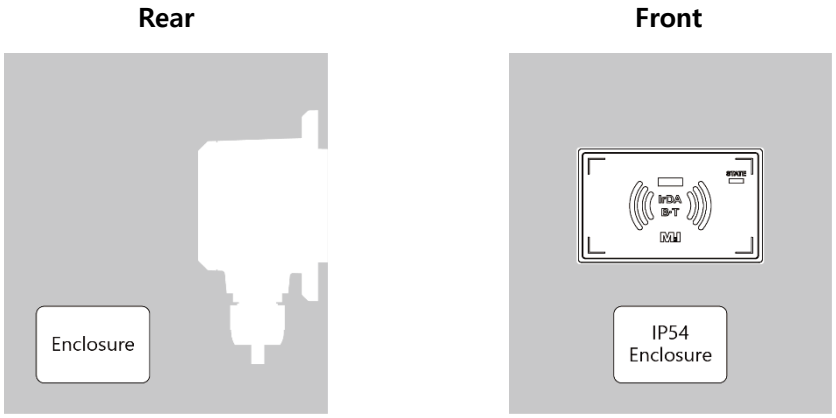
Chapter 6 Installation ⚠Warning

6.1 Installation Conditions

(1) Install and operate explosion-proof equipment only in a well-ventilated environment with a pollution degree of 2 or higher, as defined in KS C IEC 60664-1.

(2) The front of each model shall be installed in an enclosure that meets the IP54 or higher protection rating according to KS C IEC 60079-0.

(3) The installation of explosion-proof applicable equipment shall comply with KS C IEC 60079-14 in accordance.

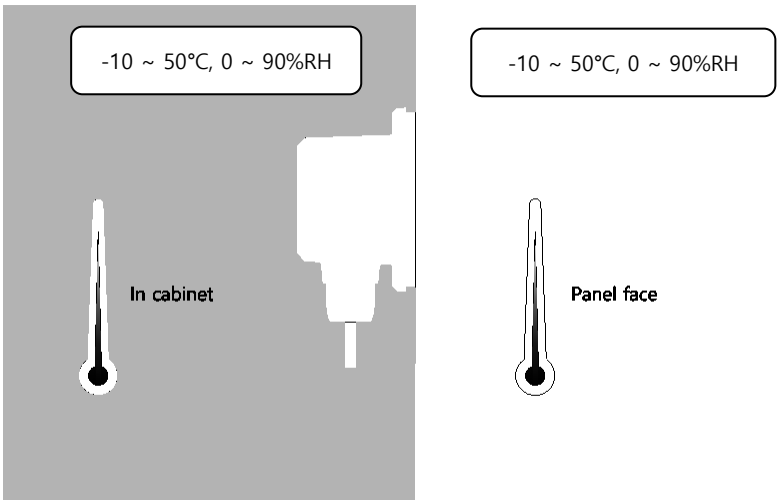


(4) When installed in a pressure explosion-proof enclosure (Ex p) meeting IP4X or higher with no exposed parts, it must be installed in a location properly protected from the ingress of solid objects or water, and the power configuration must be such that the device power is turned on after positive pressure is maintained inside the explosion-proof enclosure.

(5) - Install in an environment with a temperature of -10 to 50°C and humidity of 0 to 90%RH. Otherwise, screen discoloration or damage to the device may occur. For details, please familiarize yourself with the installation environment for each model and install accordingly.

(6) Ensure that the ambient temperature does not exceed the operating temperature for each model.

(7) To maintain explosion-proof performance, please control the mechanical hazards in the environment where the equipment is used to minimize external mechanical risks.



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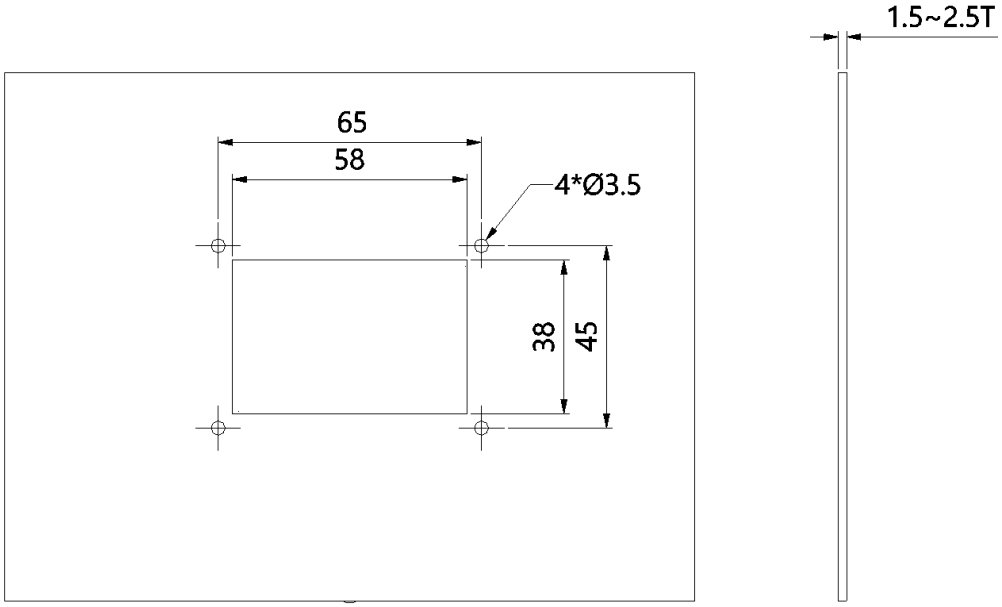
6.2 Installation Sequence ⚠Warning

Please follow the instructions below to install this product.

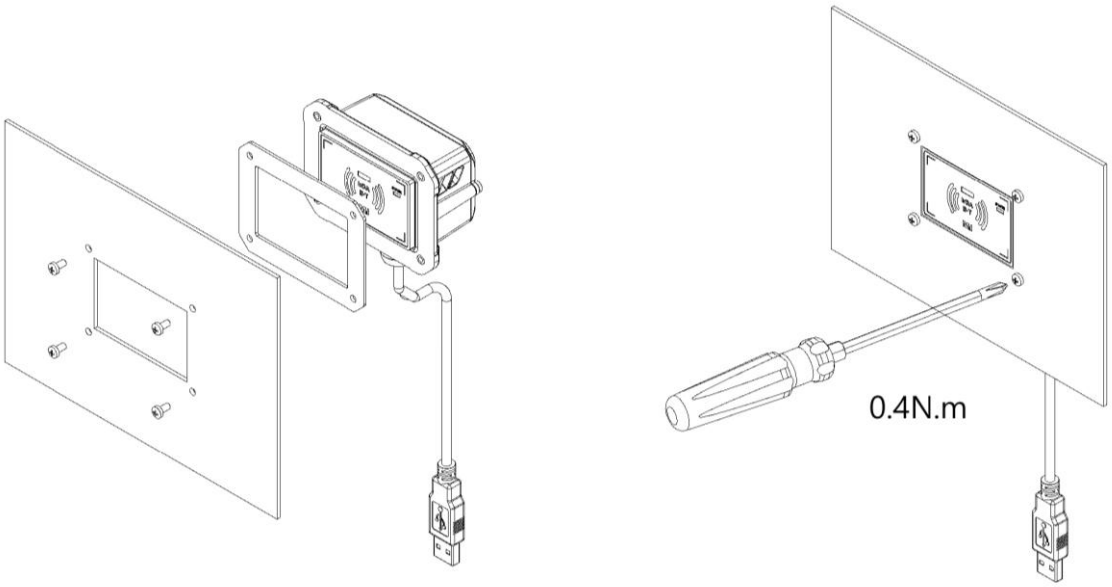
6.2.1 Panel Cut

Create a panel cutout for product mounting and insert the product into the cutout as shown below.
Before installing this product on a panel, please create a hole of the size specified in the table below.



6.2.2 Mounting

To maintain the device's IP performance, install the screws and gaskets provided with this product using the following methods.



Tighten the device to the panel cut using a screwdriver.
CAUTION: If mounting screws are over-tightened, the product may stop operating or be damaged. Tighten to a driver torque of 0.4 N.m.
Do not secure explosion-proof performance if the clamp is not tightened with a tightening force of 0.4 N.m.
⚠Warning

Chapter 7 Maintenance ⚠Warning

7.1 Screen cleaning

When the surface or frame of the display 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 check points

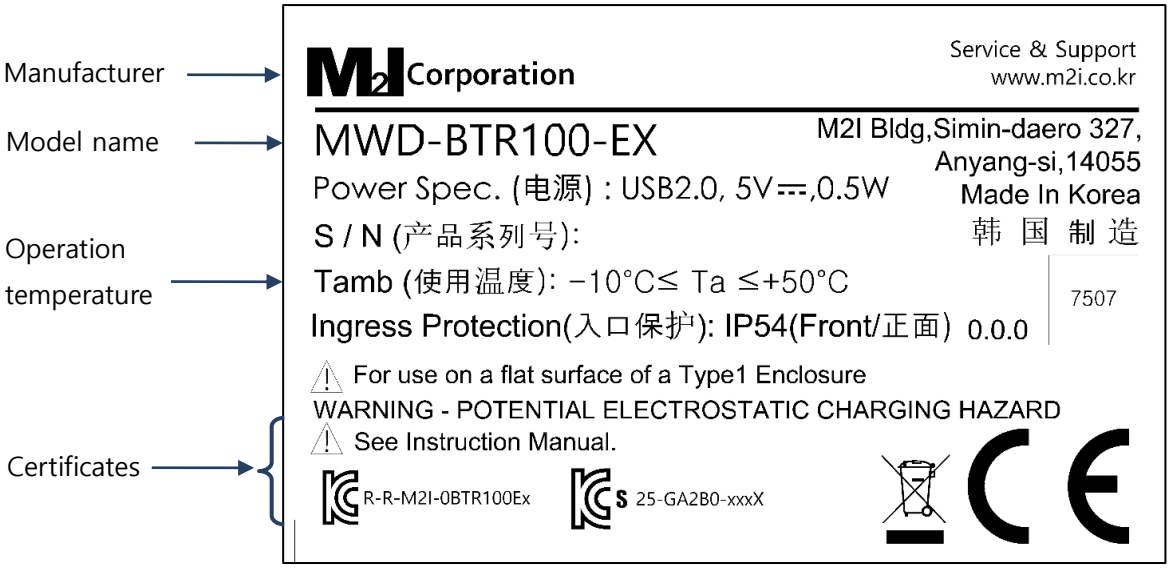
Check the followings periodically for best condition of the device.

(1) Environment check
1) Is the operating temperature within the allowable range?
2) Is the operating humidity within the allowable range?
3) Is the Surrounding pollution no corrosive gas?
4) Please check the display crack or pollution with your eyes.

7.3 When a problem occurs with your device ⚠Warning

(1) If a problem occurs during operation, stop using the device immediately and contact M2I Corporation for support.
(2) Troubleshooting and repair related to device malfunction must be performed only by personnel authorized by M2I Corporation.
(3) If the issue cannot be resolved on-site, the device may need to be sent to M2I Corporation for repair.
(4) M2I Corporation is not responsible for any damage or malfunction caused by using the device under conditions that deviate from the installation and usage guidelines stated in this manual.
(5) When excessive electromagnetic noise is radiated, attach ferrite cores to the main unit power cable and field power cable.
(6) Depending on the installation environment, strong noise may occur on power and communication lines.

Chapter 8 Product label



Doc.No.: MWD-D0003 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.

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