BioEntry W2

INSTALLATION GUIDE

Version 1.37

English
EN 101.00.BEW2

suprema
SECURITY & BIOMETRICS

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Safety Instructions

Please read this safety instructions before you use the product to prevent injury to yourself and others and to prevent property damage.

The term ‘product’ in this manual refers to the product and any items provided with the product.

Compliance Information

Warning

Used to indicate warning information that could lead to serious injury or death if violated while using the product.

Caution

Used to indicate caution information that may result in minor injury or product damage if violated while using the product.

Info

Used to provide notes or additional information while using the product.

Note

Used to provide notes or additional information while using the product.

⚠ Warning

Install

Be especially careful of miswiring when using high-capacity power supplies.

- Serious fires, electric shocks, or product damage may occur due to miswiring.

Do not allow users to install or repair the product arbitrarily.

- Causes fire, electric shock, or injury.
- No free repair service will be provided if the product is damaged due to arbitrary installation or repair by the user.

Do not install the product in places exposed to direct sunlight, moisture, dust, or soot, or where gas may leak.

- May cause fire or electric shock.

When installing the product outdoors, make sure to install it in a shaded and well-ventilated area.

Do not use a completely sealed enclosure when installing the product outdoors.

- The internal temperature of the enclosure may rise due to direct sunlight, causing fire, electric shock, or product damage.

Do not install the product in places where heat is generated, such as near heaters.

- May cause fire or electric shock due to overheating.

Do not install in damp places.

- May cause electric shock or product damage due to moisture.

Do not install in places with electromagnetic interference.

- May cause electric shock or product damage.

Usage

Do not allow liquids such as water, beverages, or chemicals to enter the product.

- May cause fire, electric shock, or product damage.

Do not use damaged power adapters or plugs, or loose outlets.

- If connections are unstable, may cause fire or electric shock.

Do not bend or break the power cord excessively.

- May cause fire or electric shock.

⚠ Caution

Install

Read this manual carefully before installing the product to ensure safe and correct installation.

When wiring power cables and connectors, make sure to turn off the power to all devices you are connecting before wiring and connecting.

- Devices may malfunction.

Before connecting the power to the product, check the manual again to ensure that wiring is correct, then connect the power.

Do not install the product in places directly exposed to sunlight or ultraviolet light.

- May cause product damage, malfunction, discoloration, or deformation.

Do not leave power cables in passageways.

- May cause bodily injury or product damage.

Do not install near strong magnetic objects such as magnets, TVs, CRT monitors, or speakers.

- The device may malfunction.

When installing the product on a wall, do not seal around the product with silicone or similar materials.

- The device may malfunction.

When installing multiple devices, ensure the minimum spacing distance is observed.

- May affect the RF and BLE performance of other devices, causing them to malfunction.

Use a power adapter that has IEC/EN 62368-1 approval and is rated above the power consumption of the terminal device. It is recommended to use the power adapters sold by Suprema.

- Using an unsuitable power supply may cause devices to malfunction.
- Refer to the Power in the product specifications for maximum current consumption specifications.

Ensure that the product and Secure I/O 2, electric lock (electronic locking device) use separate power supplies.

- Devices may malfunction.

Do not connect the power supply and PoE power together.

- Devices may malfunction.

It is recommended to use an enclosure when installed outdoors with full exposure.

- Decreased waterproof and dustproof performance may cause malfunction.

Usage

Do not drop or subject the product to shock.

- The device may malfunction.

Ensure the power supply is not interrupted during firmware upgrades of the product.

- The device may malfunction.

Use the product within -20 °C to 50 °C and store it at appropriate temperatures, not too low or too high.

- The device may malfunction.

Be careful when cleaning the product.

- Gently wipe the product surface with a clean, dry cloth.
- If disinfecting the product, dampen a clean cloth with a suitable amount of disinfectant alcohol and gently wipe the product surface. Use disinfectant alcohol that contains 70-75% isopropyl alcohol and a clean, lint-free soft cloth.
- Do not spray disinfectant directly onto the product.

Do not use the product for purposes other than its intended use.

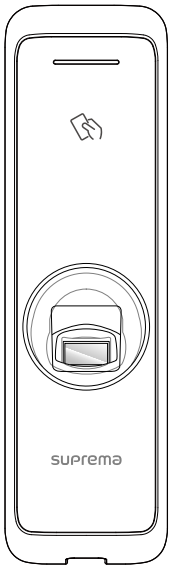
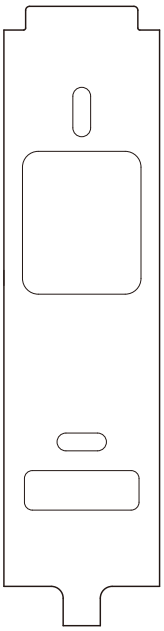
- The device may malfunction.

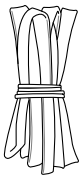
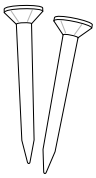
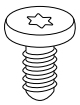
> **RTC Battery**
>
> Replacing with unauthorized or incorrect types of batteries may pose a risk of explosion. Dispose of batteries according to local or international waste regulations.

Getting Started

Provides initial procedures for getting started with the device.

Components

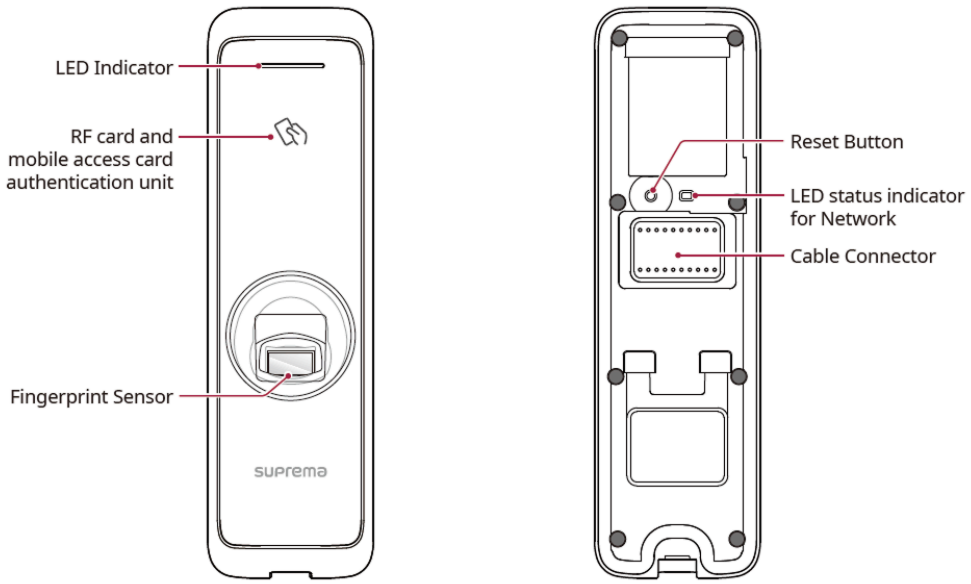
			
BioEntry W2	Wall Bracket	Quick Guide	Open Source Software Guide

				
Shrink Tube	Fixing Screws x2	Bracket Fixing Screw (Star Shaped)	Diode	120 Ω Resistor

Info

- Components may vary according to the installation environment.
- When assembling the product with the bracket, you can use the included bracket fixing screw (Star Shaped) instead of the product fixing screw for enhanced security.

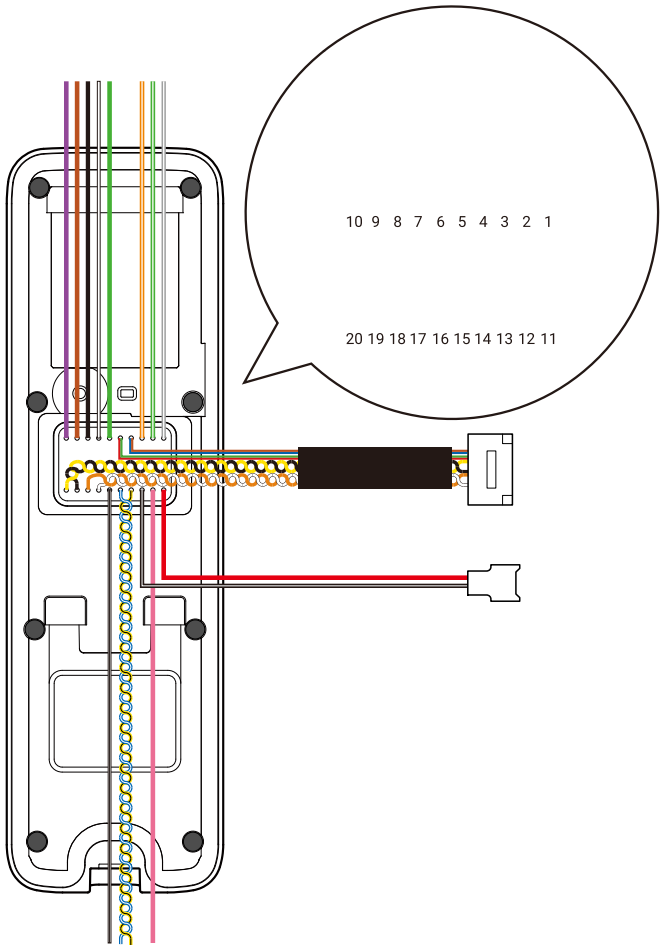
Name and function of each part



- **LED Indicator**: Indicates the operational status of the device with the color of the LED.
  - Green: Authentication success.
  - Red: Authentication failure.
  - Blue/Cyan blinking: Normal operation.
  - Blue/Green blinking:
    - When setting **DHCP** to use, unable to retrieve IP address.
    - When in **Slave** mode, the connection to the master device is disconnected.
    - When Initializing Network Settings.
  - Green blinking: Waiting for input.
  - Green/White blinking: Connecting to Suprema Airfob Pass (BLE) Application
- **RF card and mobile access card authentication unit**: Part to scan a RFID card or mobile access card for entrance.
- **Fingerprint Recognition Unit**: The part that recognizes the fingerprint for access.
- **Reset Button**
  - Initializes network settings. For more information on initializing network settings, refer to Initialize Network Settings.
  - Deletes all information and certificates stored on the device and initializes the settings. For more information on factory initialization, refer to Factory default.
- **Network Status LED**: Indicates network connection status.
- **Cable**

  Power / Ethernet + PoE / RS-485 / Wiegand Input/Output / Input / Relay

Cable



Pin	Name	Color
1	RLY NO	Gray (white stripe)
2	RLY COM	Green (white stripe)
3	RLY NC	Orange (white stripe)
4	VB2	Blue/Brown
5	VB1	Red/Green
6	WG D0	Green
7	WG D1	White
8	WG GND	Black
9	INPUT1	Brown
10	INPUT0	Purple
11	PWR +VDC	Red
12	Not Connected	Pink
13	PWR GND	Black (white stripe)
14	485 TRXN	Yellow (black stripe)
15	485 TRXP	Blue (white stripe)
16	485 GND	White (black stripe)
17	ENET TXP	White
18	ENET TXN	Orange
19	ENET RXP	Black
20	ENET RXN	Yellow

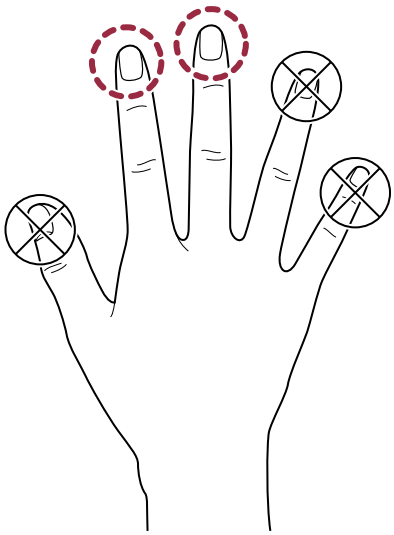
Info

There are various conductors of size AWG 26, which should be protected with standard sheathing or equivalent material when wiring. Also, ensure the lead does not contact conductors larger than 18 AWG (0.82 mm2).

Correct fingerprint input method

In order to improve the fingerprint authentication rate, enroll the fingerprint correctly. This product can authenticate fingerprints even if the user's fingerprint input angle and position change. If you enroll the fingerprint with attention to the following matters, the authentication rate can be improved.

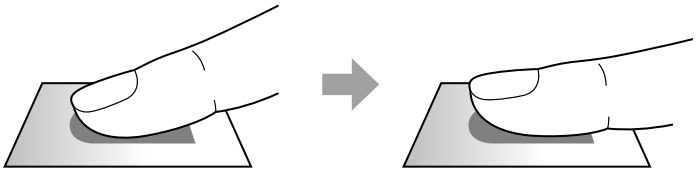
Selecting a finger for fingerprint input



- In preparation for the case that the fingerprint of a specific finger cannot be used, for example if the user is lifting a load with one hand or a finger gets hurt, up to 10 fingerprints for each user can be enrolled.
- In the case of a user whose fingerprint cannot be recognized well, the authentication rate can be improved by enrolling the same finger twice repeatedly.
- If a finger has a cut or the fingerprint is blurry, select another finger for the fingerprint.
- It is recommended to use the index finger or the middle finger when scanning the fingerprint. The authentication rate can be reduced if it is difficult to place another finger at the center of fingerprint sensor accurately.

Fingerprint enroll method

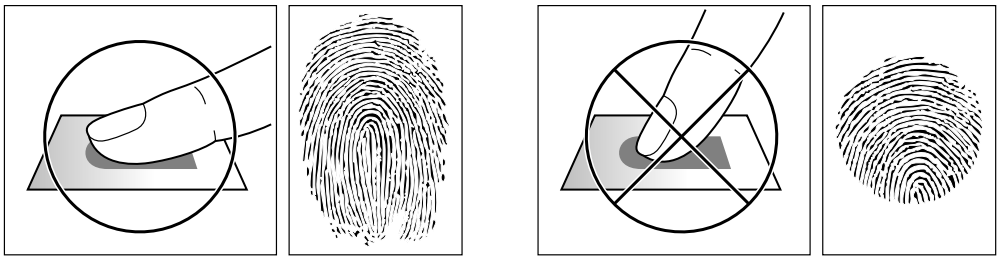
1. Place the finger you want to enroll on the fingerprint recognition unit and gently press it so that the fingerprint is authenticated well.



2. After the "beep" sound, scan the fingerprint of the enrolled finger again. (scan the fingerprint of a finger to be enrolled twice)

Cautions for fingerprint enrollment

When a fingerprint is recognized, it is compared with the initially enrolled fingerprint, so the initial fingerprint enroll is the most important. Pay attention to the following matters when enrolling the fingerprint.



- Place the finger deep enough to contact with the sensor completely.
- Place the center of the fingerprint in the center of the sensor.
- If a finger has a cut or the fingerprint is blurry, select another finger for the fingerprint.
- Scan the fingerprint correctly without moving according to the instruction on the screen.
- If you make the finger upright so that the contact area with the sensor is decreased or the angle of finger is warped, fingerprint authentication may not be performed.

If fingerprint authentication does not work well

This product can authenticate fingerprints regardless of seasonal changes or changes in the condition of the fingers. However, the authentication rate may vary according to the external environment or fingerprint input method. If the fingerprint authentication cannot be done smoothly, it is recommended to take the following measures.

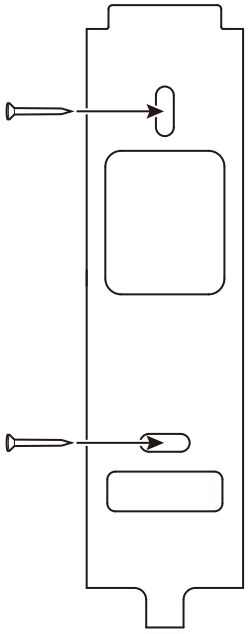
- If the finger is smeared with water or sweat, dry off the finger and then scan the finger.
- If the finger is too dry, blow your breath on the fingertips and then scan the finger.
- If the finger has a cut, enroll the fingerprint of another finger.
- Since the initially enrolled fingerprint is often not input correctly, please re-enroll the fingerprint according to the Cautions for fingerprint enrollment.

Installation

Provides the complete installation procedures and connection examples required for the device.

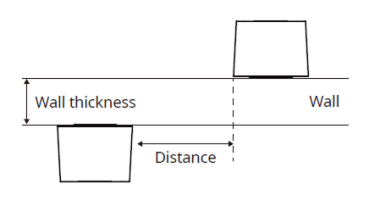
Fixing the bracket and the product

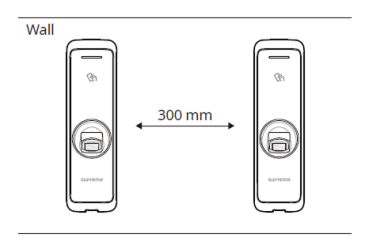
1. Secure the bracket tightly using the fixing screws at the location where the product will be mounted.



Info

- If installing the product on a concrete wall, drill a hole, insert a PVC anchor, and secure it with a fixing screw.
- To avoid RF interference, a minimum separation distance must be maintained.

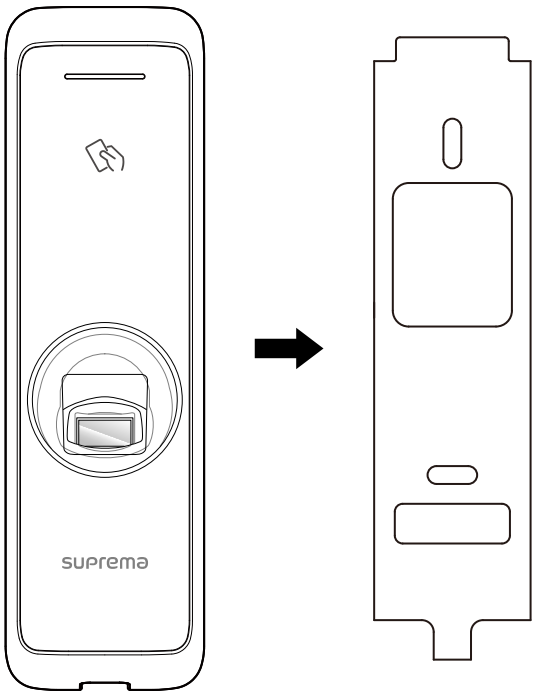




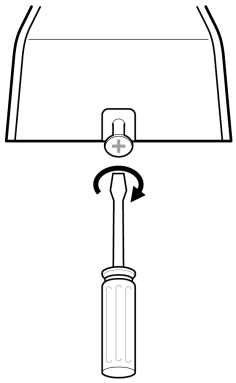
Wall thickness	Distance
100 mm	270 mm
120 mm	250 mm
150 mm	170 mm

- When using a mobile access card, install devices maintaining a minimum distance of 1 m between devices to avoid BLE interference.
- Wireless electronic products must be used in the same manner as physical credentials and must transmit user data over short distances.

2. Mount the product on the fixed bracket.



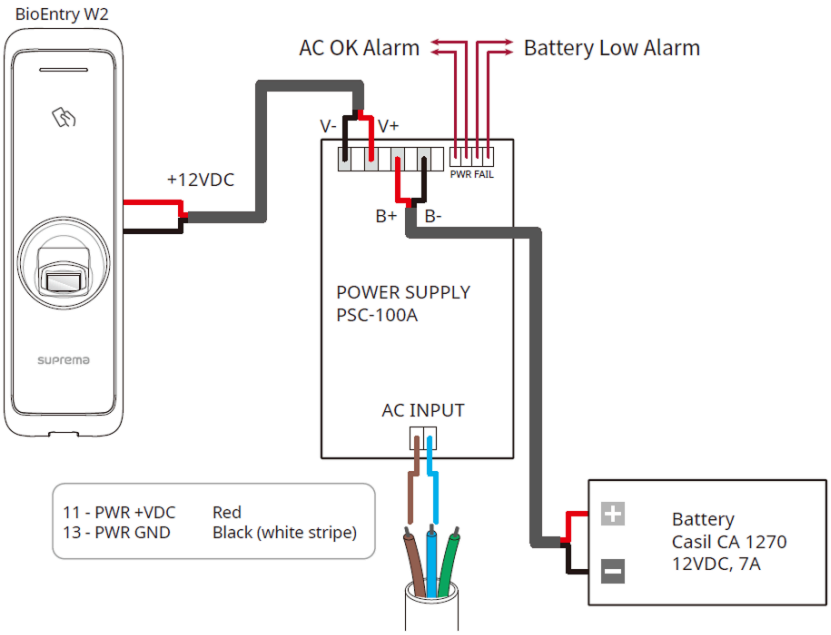
3. Rotate the fixing screws to assemble the product with the bracket.



Info

When assembling the product with the bracket, you can use the included bracket fixing screw (Star Shaped) instead of the product fixing screw for enhanced security.

Power supply connection



Caution

- Listed Class 2 power unit shall be recommended to use.
- The unit is powered by external Listed Class 2 power supply with 12VDC or by Listed to UL294B PoE power source.
- For ULC S319 compliance, connect PSC-100A power supply and Casil CA 1270 battery.
- DO NOT connect the device to the DC power supply (or adapter) and PoE power supply at the same time.
- Use the IEC/EN 62368-1 approved power adapter that supports higher power consumption than the product. If you wish to connect and use another device to the power supply adapter, you should use an adapter with a current capacity which is the same or larger than the total power consumption required for the terminal and another device.
  - Refer to the Power in the product specifications for maximum current consumption specifications.
- Use a separate power supply for Secure I/O 2, the electric lock, and the product respectively. If connecting and using the power supply to these devices together, the devices may malfunction.
- DO NOT extend the length of power cable when using the power adapter.
- Alarm signals are transmitted via relay contacts through AC OK and battery low voltage status pins.

Feature	Description	Relay status
AC power confirmation	AC power is on	Short circuit
	AC power is off	Open
Battery low voltage status	When the battery voltage is below 11 V	Short circuit
	When the battery voltage is above 11 V	Open

- An external power source is required to use the alarm signal feature. The maximum applied voltage is 30 V, and the maximum sink current is 1 A.
- PoE power must comply with National Electrical Code, ANSI / NFPA 70, Article 725.121, Class 2 and Class 3 circuit power requirements.
- 5e cable connections are the recommended minimum performance category. The performance category must match the transmission speed required at the installation site.
- The minimum conductor gauge that can be connected between PSE or power injector and PD is 26 AWG (0.13 mm2) for patch cables. For horizontal or riser cables, the minimum conductor gauge is 24 AWG (0.21 mm2).
- When the product is powered via PoE, it must be either UL294B or UL294 8th Ed. compliant source.
- Compliance with IEEE 802.3 (at or af) specifications does not count as part of this requirement.

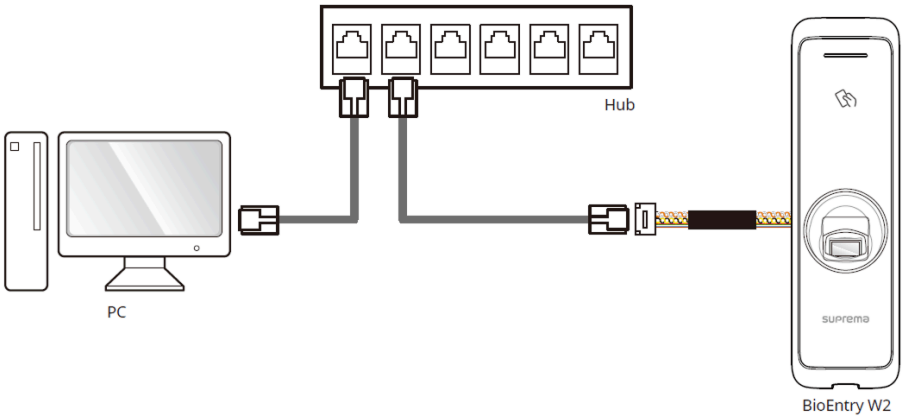
Network Connection

TCP/IP

LAN connection (connecting to a hub)

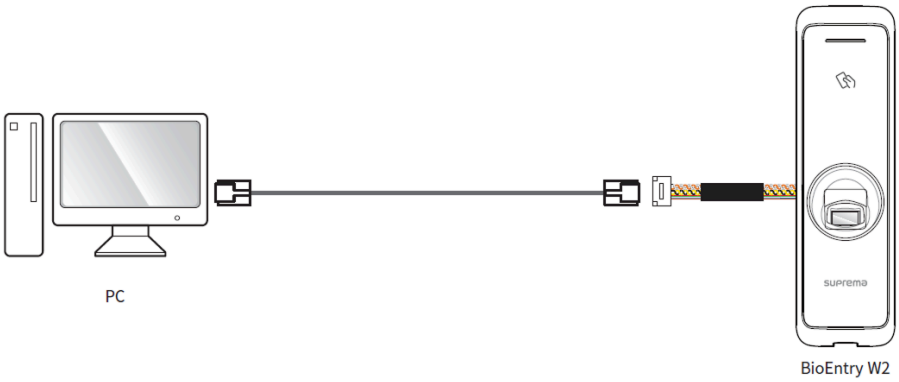
You can connect the product to a hub using a general type CAT-5 cable.

Use a PSE hub to supply power via PoE.



LAN connection (connecting to a PC directly)

This device has an automatic MDI/MDIX function so that it can be connected to a PC directly using a normal straight type CAT-5 cable or a cross cable.



Network ports and services

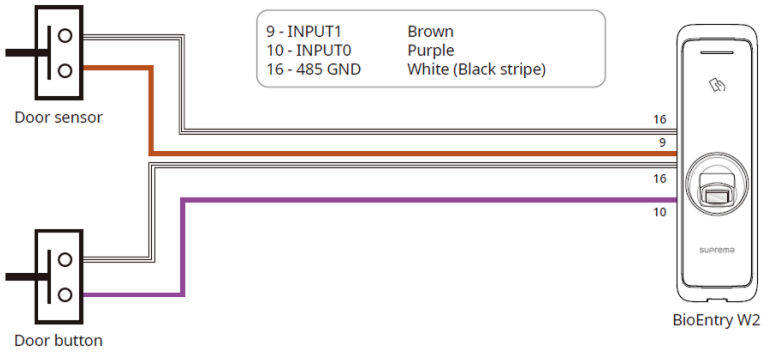
This device uses the following ports for network communication and stable service operation.

Protocol	Service Description
TCP	Used for communication services between the server and the device, and for the device operation status switching service.
UDP	Used for the device discovery service to search for devices on the network.

Info

These ports are used to provide normal network features of the product. When configuring firewall rules or network security settings, allow the use of these ports.

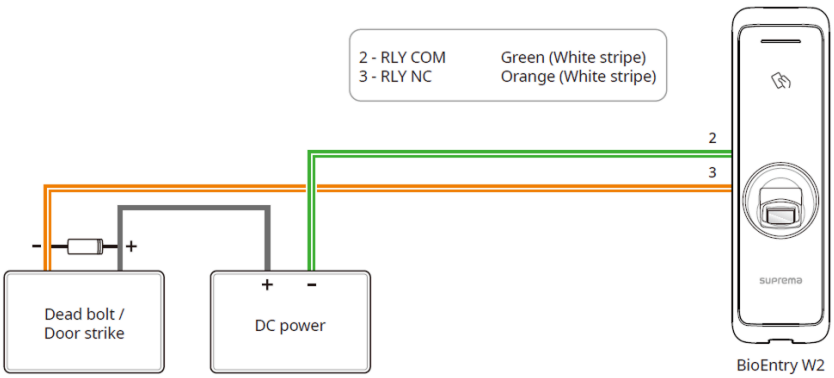
Input connection



Relay Connection

Fail Safe Lock

In order to use the Fail Safe Lock, connect N/C relay as shown in the figure below. There is normally a current flowing through the relay for the Fail Safe Lock. When the relay is activated, blocking the current flow, the door will open. If the power supply to the product is cut off due to a power failure or an external factor, the door will open.



Caution

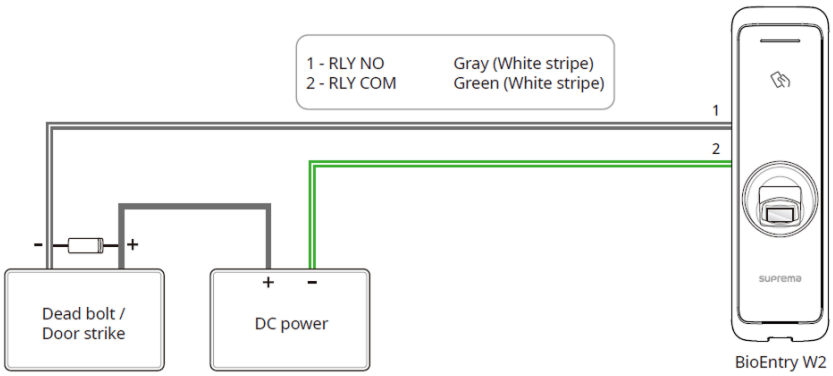
- Install a diode at both sides of the door lock wire as shown in the figure to protect the relay from the reverse current, which occurs when the door lock operates.
- Use a separate power supply for the product and the door lock.
- Suprema's standalone intelligent readers contain internal relays that can directly lock/unlock doors without external controllers for added convenience. For access control applications in need of security, however, it is NOT recommended to use the internal relay of a reader to prevent any tampering attacks which can potentially trigger the door unlock. For such applications, it is highly recommended to use a separate relay unit for a lock control such as Suprema's Secure I/O 2, DM-20 or CoreStation installed at a secure side of a door.

Info

Take caution of the installation direction of the diode. Install the diode close to the door lock.

Fail Secure Lock

In order to use the Fail Secure Lock, connect N/O relay as shown in the figure below. There is normally no current flowing through the relay for the Fail Secure Lock. When the current flow is activated by the relay, the door will open. If the power supply to the product is cut off due to a power failure or an external factor, the door will lock.



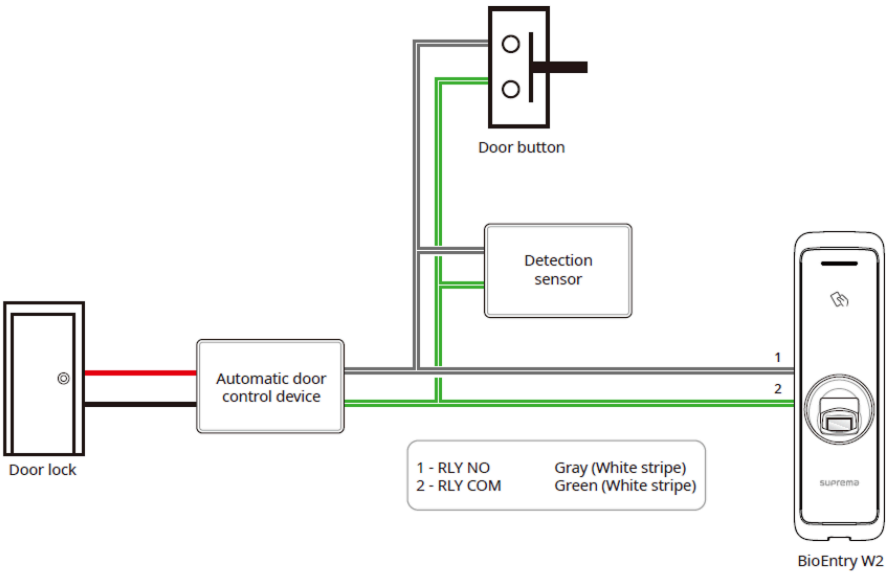
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Info

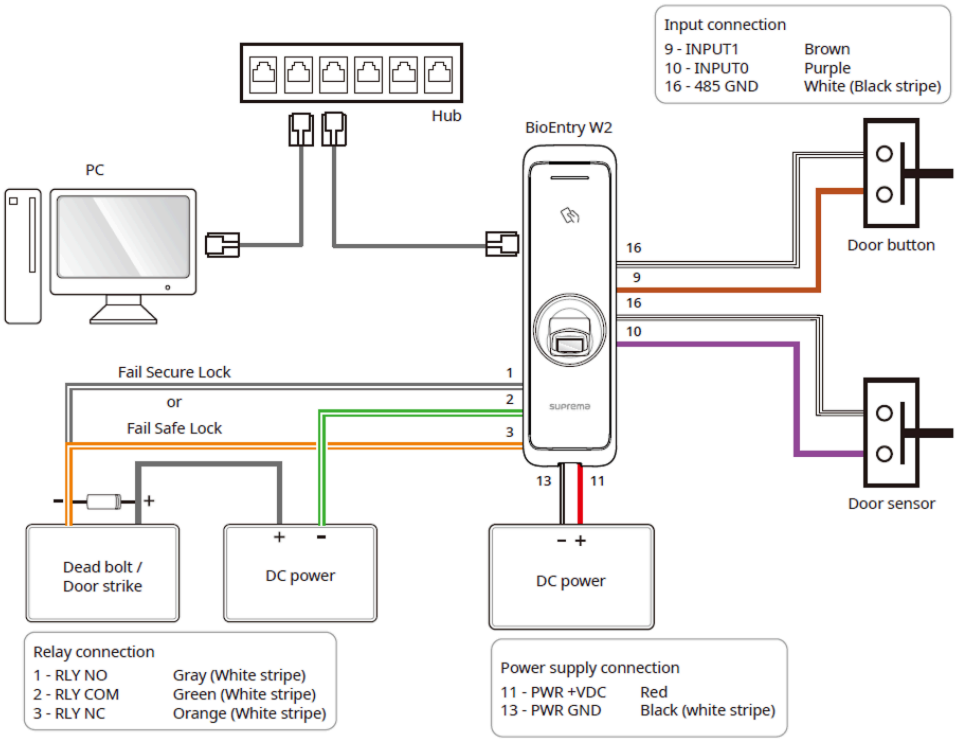
Take caution of the installation direction of the diode. Install the diode close to the door lock.

Automatic door connection



Connecting as a Standalone

The product can be connected to the door lock, door button, and door sensor directly without connecting a separate I/O device.



Caution

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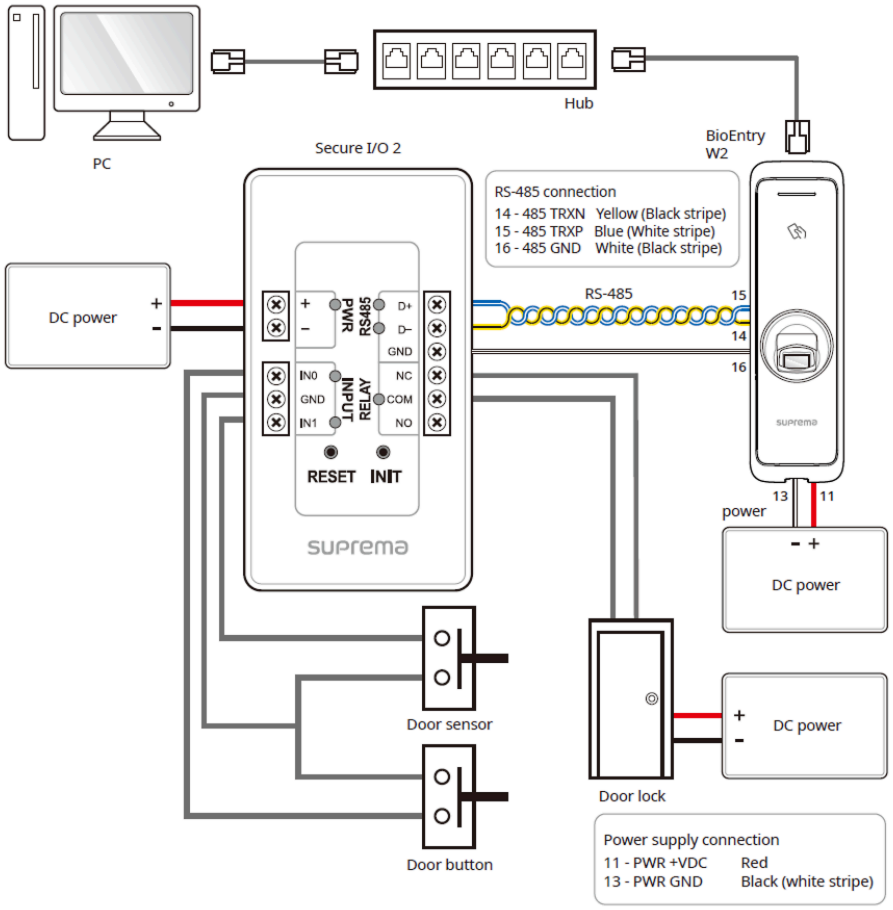
Info

- The device can be used as a multi-door controller with the slave devices with the RS-485 cable. The slave devices are used as dummy readers and authentication is performed in the master device.
- If XPass or XPass 2 is connected to the master device, only card authentication can be used.
- The maximum number of slave devices available to connect varies according to the authentication method, number of users, and number of devices. Also note that the number of slave devices affects the authentication performance.
- Connect up to 31 slave devices to a master device. The bandwidth of RS-485 allows for up to 7 fingerprint authentication devices to be connected.
- For more information, contact the Suprema Technical Support Team.

Connecting to Secure I/O 2

Secure I/O 2 is an I/O device, can be connected to the product with the RS-485 cable. Security can be maintained even if the connection between the product and Secure I/O 2 has been lost or the power supply to the product has been shut off due to external factors.

- Use an AWG24 twisted pair with a maximum length of 1.2 km for the RS-485 cable.
- It is recommended to use RS-485 cables with a characteristic impedance of 120 Ω.
- If connecting with a RS-485 daisy chain, connect the termination resistor (120 Ω) to both ends of the daisy chain connection. If connected to the middle line, the signal level becomes smaller and the communication performance will deteriorate. Make sure to connect it to both ends of the daisy chain connection.



Info

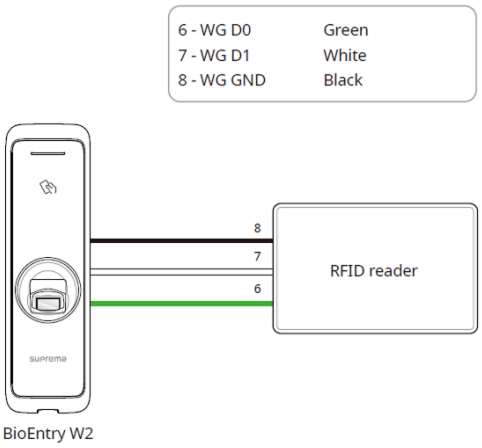
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- If XPass or XPass 2 is connected to the master device, only card authentication can be used.
- The maximum number of slave devices available to connect varies according to the authentication method, number of users, and number of devices. Also note that the number of slave devices affects the authentication performance.
- Connect up to 31 slave devices to a master device. The bandwidth of RS-485 allows for up to 7 fingerprint authentication devices to be connected.
- For more information, contact the Suprema Technical Support Team.

Info

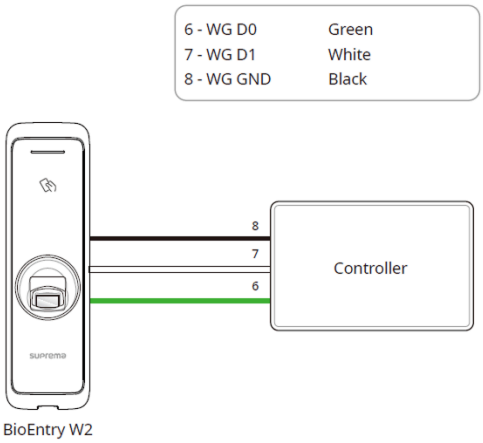
- Access control system configuration with connection to Secure I/O 2 is not Listed to UL294.

Wiegand Connection

Used as a Wiegand input device.



Used as a Wiegand output device.



Initialize Network Settings

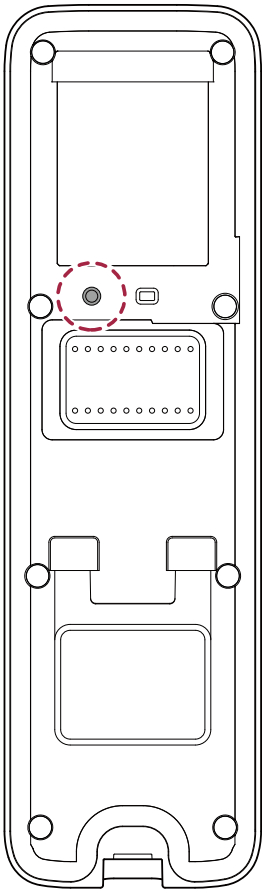
Initialize the device's network settings.

1. Power on.
2. Press the reset button until the device automatically reboots.
3. Connect the device using the initialized network information.
    - **TCP/IP Address**: DHCP address assignment (if DHCP address assignment fails, will be set to 169.254.x.x).
    - **Server Mode**: Disable
    - **RS-485**: Default, 115200 bps
4. Change the TCP/IP or RS-485 information.
5. Check if the network information is correctly set after turning the power off and on.

Factory default

Delete all information stored on the device and initialize the settings.

1. Power on.
2. Quickly press the reset button three times.



3. Press the reset button once more when the device's LED blinks green.

> **Info**
> You can only use Factory Default when the root certificate is stored on the device.

Product Specifications

Provides key specifications of the product, including size, features, and performance.

Credentials

Biometric	**Fingerprint** • **Image Dimension:272 x 320 pixels** • **Image Bit Depth:8 bits, 256 grayscale** • **Resolution:500 dpi** • **Template:SUPREMA / ISO19794-2 / ANSI-378** • **Extractor / Matcher:MINEX certified and compliant** • **Live Fingerprint Detection:Supported (HW + SW-based)**	
RF Card	**BEW2-OHPB**	**125kHz EM, HID Prox & 13.56MHz MIFARE, MIFARE Plus, DESFire, DESFire EV1/EV2/EV3[1)], FeliCa**
	BEW2-ODPB	**125kHz EM & 13.56MHz MIFARE, MIFARE Plus, DESFire, DESFire EV1/EV2/EV3[1)], FeliCa**
	BEW2-OAPB	**125kHz EM, HID Prox & 13.56MHz MIFARE, MIFARE Plus, DESFire, DESFire EV1/EV2/EV3[1)], FeliCa, iCLASS SE/SR/Seos**
RF Read Range[2)]	**EM/MIFARE/DESFire/HID iCLASS: 50 mm, HID Prox/FeliCa: 30 mm**	
Mobile	**NFC, BLE**	

General

CPU	**1.2 GHz Quad Core**
Memory	**2 GB Flash + 256 MB RAM**
Crypto Chip	**Supported**
LED	**Multi-color**

Sound	**Multi-tone Buzzer**
Operating Temperature	**-20 °C ~ 50 °C**
Storage Temperature	**-40 °C ~ 70 °C**
Operating Humidity	**0 % ~ 80 %, non-condensing**
Storage Humidity	**0 % ~ 90 %, non-condensing**
IP Rating	**IP67**
IK Rating	**IK09**
Authentication	**CE, UKCA, KC, FCC, IC, RCM, BIS, ANATEL, SIG, RoHS, REACH, WEEE, ETL Listed to UL 294**[3)]

Capacity

Max. User	**500,000**[4)]
Max. Credentials (1:N)	**Fingerprint: 100,000**
Max. Credentials (1:1)	• **Fingerprint: 500,000** • **Card: 500,000**
Max. Text logs	**1,000,000**

Interface

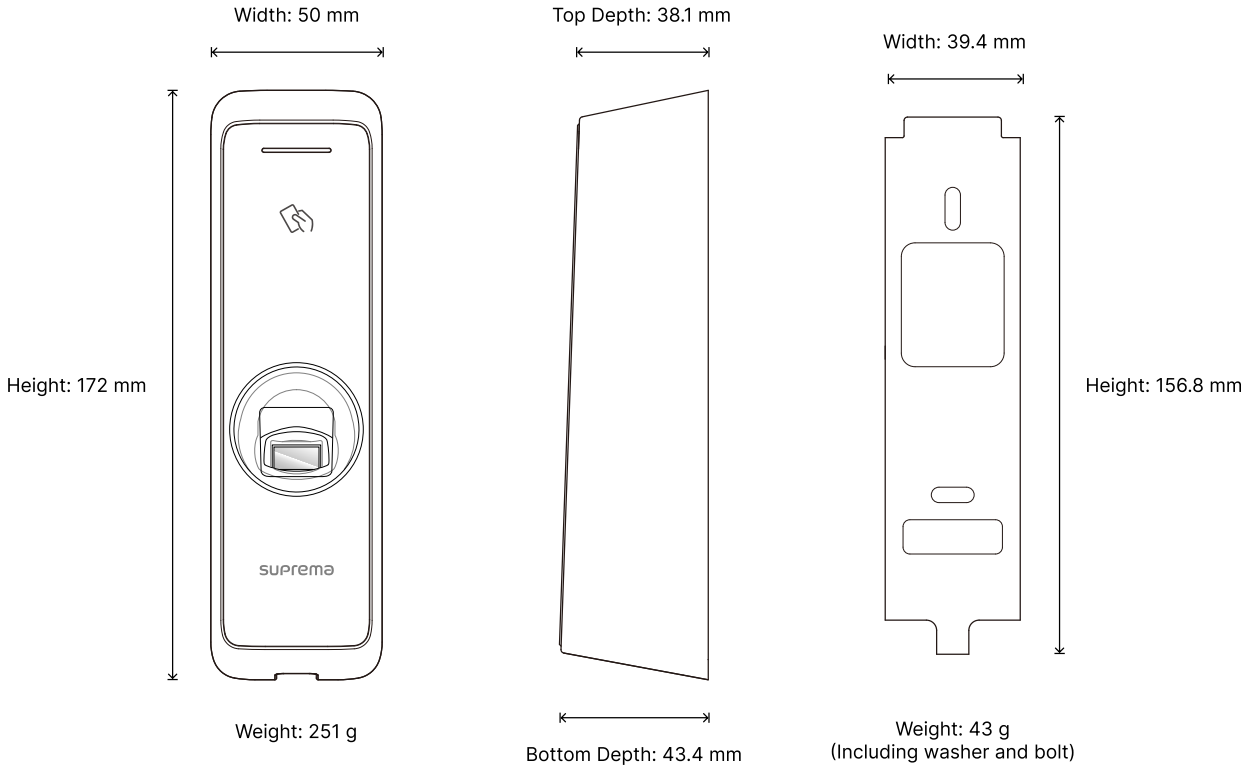
Ethernet	**Supported (10/100 Mbps, auto MDI/MDI-X)**
Network Protocol	**TCP, UDP**
RS-485	**1 ch Master / Slave (Selectable)**

RS-485 Communication Protocol	**OSDP V2 compliant**
Wiegand	**1 ch Input / 1 ch Output (Selectable)**
Input	**2 ch Inputs**
Relay	**1 relay**
PoE	**Supported (Power over Ethernet 44 VDC Max 12 W, IEEE 802.3af)**
Tamper	**Supported**

Electrical

Power	**12 Vdc**	**Current: Max. 0.5 A**
Switch Input VIH	• **Min.: 3 V** • **Max.: 5 V**	
Switch Input VIL	**Max.: 1 V**	
Switch Pull-up Resistance	**4.7 kΩ (The input ports are pulled up with 4.7 kΩ.)**	
Wiegand Output VOH	**More than 4.8 V**	
Wiegand Output VOL	**Less than 0.2 V**	
Wiegand Output Pull-up Resistance	**Internally pulled up with 1 kΩ**	
Relay	• **2 A @ 30 VDC Resistive load** • **1 A @ 30 VDC Inductive load**	

Dimensions and Weight



1) DESFire EV2/EV3 cards are backward compatible with DESFire EV1 cards, supporting CSN and smart card features, including those of the DESFire EV1 card.

2) RF read range will vary depending on installation environment.

3) UL Safety Standard - Access Control Device

- Destructive attack - Level 2 / Line security - Level 2 / Endurance - Level 1 / Standby power- Level 1

4) The number of users registered without having any credential data.

Info

Product specifications are subject to change without notice for performance improvement.

Regulatory Information

Provides information on regulations and certifications complied with by the product.

FCC Compliance Information

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES.

Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

> **Info**
>
> This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
>
> Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
>
> This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
>
> This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body. Do not install or operate this device and its antenna in conjunction with any other antenna or RF transmission device.

IC information

This device complies with Industry Canada's licence-exempt RSSs.

Operation is subject to the following two conditions:

1. This device may not cause interference; and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence.

L'exploitation est autorisée aux deux conditions suivantes :

1. l'appareil ne doit pas produire de brouillage ;
2. l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le

fonctionnement.

EU Declaration of Conformity (CE)

This product is CE marked according to the provisions of the Radio Equipment Directive (RED) 2014/53/EU.

Hereby, Suprema Inc. declares that this product is in compliance with the essential requirements and other relevant provisions of Radio Equipment Directive (RED) 2014/53/EU and is marked with the CE mark. This device is a Class 1 radio device according to the instructions.

- Bluetooth transmit power: -0.1 dBm
- Bluetooth frequency: 2402~2480 MHz
- NFC frequency: 13.56 MHz
- RFID frequency: 13.56 MHz + 125 kHz

For more information, please contact us via the contact details below.

Suprema Inc.

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Tel: +82-31-783-4502 / Fax: +82-31-783-4503

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- This product uses the “OpenSSL”, which is licensed under the OpenSSL and Original SSLeay licenses. For more information about the OpenSSL and Original SSLeay licenses, please see the OpenSSL License and Original SSLeay License.
- The source modified based on Linux kernel 3.x, glibc library, and QT library included in this product can be downloaded by contacting the Suprema Technical Support Team.

Suprema Inc.

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