BioLite N2

INSTALLATION GUIDE

Version 1.14

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suprema

SECURITY & BIOMETRICS

CONTENTS

Safety Instructions 4

Compliance Information 4

Getting Started 8

Components 8

Name and function of each part 9

Correct fingerprint input method 11

Installation 13

Fixing the bracket and the product 13

Power supply connection 16

Network Connection 17

Input connection 18

Relay Connection 19

Connecting as a Standalone 22

Connecting to Secure I/O 2 23

Wiegand Connection 25

Firmware Version 25

Product Specifications 26

Credentials 26

General 26

Capacity 27

Interface 28

Electrical 28

Dimensions and Weight 29

Regulatory Information 30

FCC Compliance Information 30

EU Declaration of Conformity (CE) 31

Appendices 32

Disclaimers 32

Copyright Notice 33

Open Source License 33

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.

Do not connect to receptacle controlled by a switch.

⚠ 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 the UL 60950-1/UL 62368-1 and UL 294, or equivalent LSS standard that includes supply line transient testing, approved power adapter that supports higher power consumption than the product.

- 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.

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.

Manage the password so others do not know it, and change it regularly.

- This may lead to unauthorized access.

Do not press the product's buttons (touchpad) forcefully or use sharp tools to press them.

- The device may malfunction.

Use the product within -20 °C ~ 50 °C (BLN2-PAB: -10 °C ~ 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.

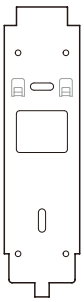
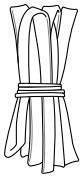
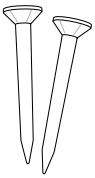
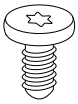
- The device may malfunction.

> **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.

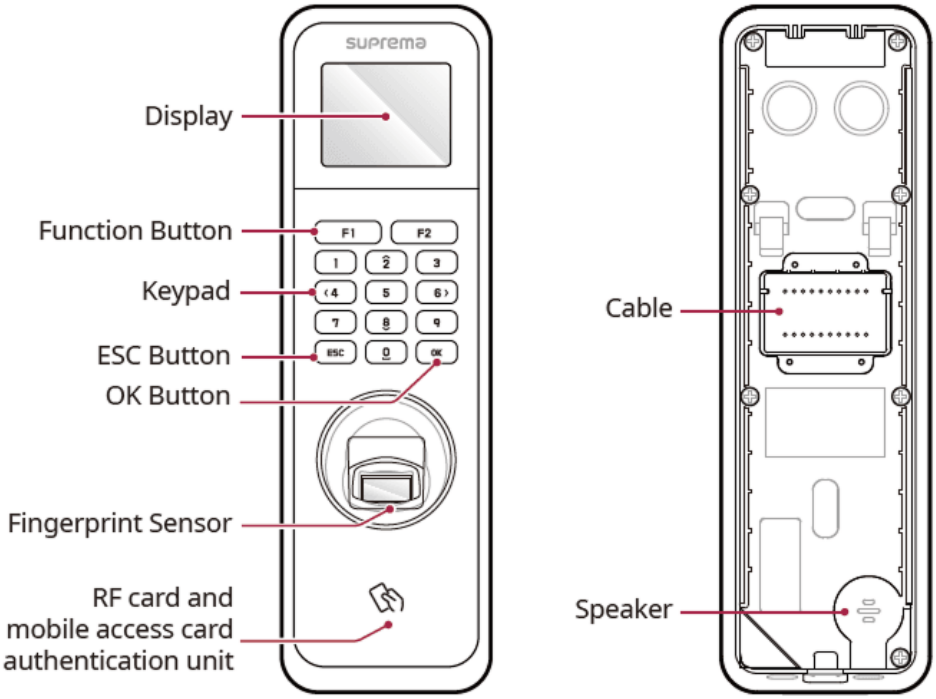
Components

		
BioLite N2	Wall Bracket	Shrink Tube
		
Fixing Screws x2	Quick Guide	Open Source Software Guide
		
Bracket Fixing Screw (Star Shaped)	120 Ω Resistor	Diode

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.

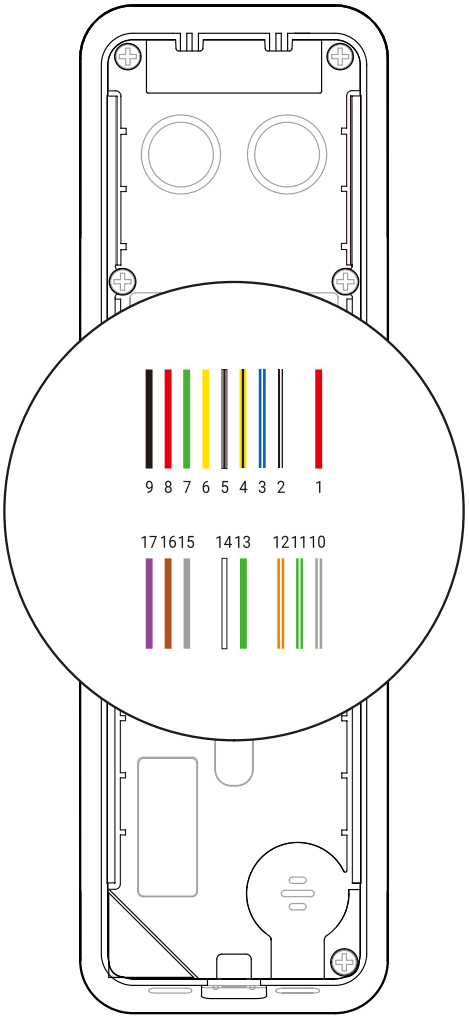
Name and function of each part



- **Display**: Provides a UI for operation.
- **Feature Button**: Used for attendance key, text modification, etc.
- **Keypad**
  - **0-9**: Used to input numbers or characters.
  - **2, 4, 6, 8**: Used to navigate to the desired item.
- **OK Button**: Used to select attendance mode and save settings. If the work code is set, you can press and hold to change the user's work code.
- **ESC Button**: Used to open the menu, go back to the previous screen, and cancel input.
- **Fingerprint Recognition Unit**: The part that recognizes the fingerprint for access.
- **RF card and mobile access card authentication unit**: Part to scan a RFID card or mobile access card for entrance.
- **Cable**

  Power / RS-485 / Ethernet / Relay / Wiegand Input/Output / Input
- **Speaker**: Delivers sound.

Cable

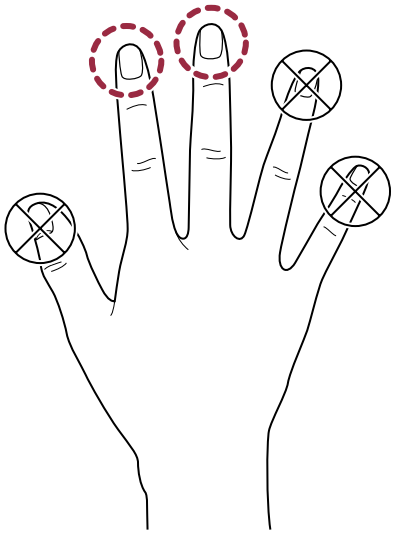


Pin	Name	Color
1	PWR +VDC	Red
2	PWR GND	Black (White Stripe)
3	485 TRXP	Blue (White Stripe)
4	485 TRXN	Yellow (Black Stripe)
5	485 GND	White (Black Stripe)
6	ENET RXN	Yellow
7	ENET RXP	Green
8	ENET TXN	Red
9	ENET TXP	Black
10	RLY NO	Gray (White Stripe)
11	RLY COM	Green (White Stripe)
12	RLY NC	Orange (White Stripe)
13	WG D0	Green
14	WG D1	White
15	INPUT GND	Gray
16	INPUT1	Brown
17	INPUT0	Purple

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.

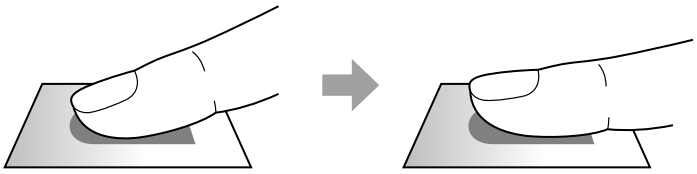
Selecting a finger for fingerprint input



- 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

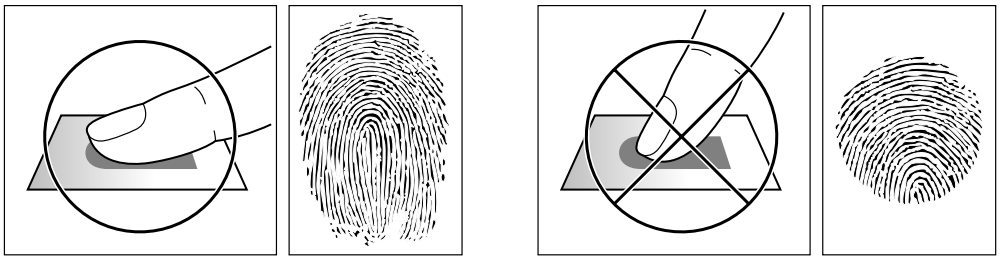
1. When the screen displays "Please input your fingerprint," place the finger you want to enroll on the fingerprint recognition unit and gently press it so that the fingerprint is authenticated well.



2. When the re-input screen is displayed after a 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.

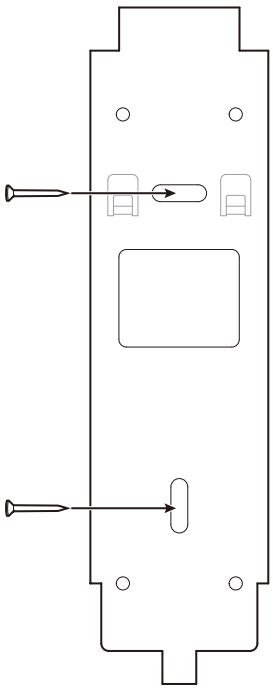
- If the finger is smeared with water or sweat, dry off the finger and then scan the finger.
- If the finger is too dry, blow your breath on the fingertips and then scan the finger.
- If the finger has a cut, enroll the fingerprint of another finger.
- Since the initially enrolled fingerprint is often 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.

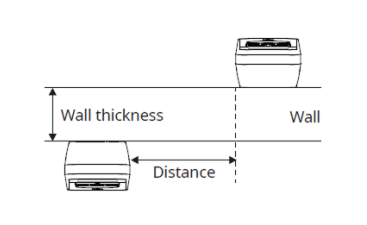
Fixing the bracket and the product

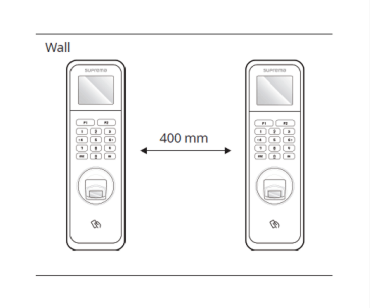
1. Secure the bracket tightly using the fixing screws at the location where the product will be mounted.



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.

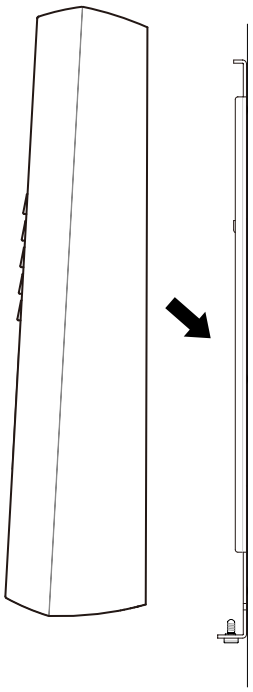




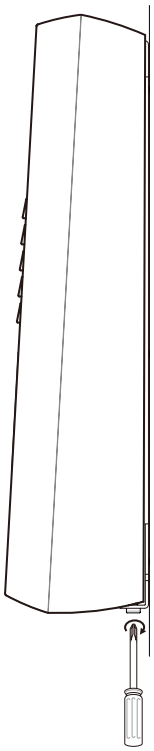
Wall thickness	Distance
100 mm	350 mm
120 mm	350 mm
150 mm	300 mm

- When using a mobile access card, install devices maintaining a minimum distance of 1 m between devices to avoid BLE interference.

2. Mount the product on the fixed bracket.



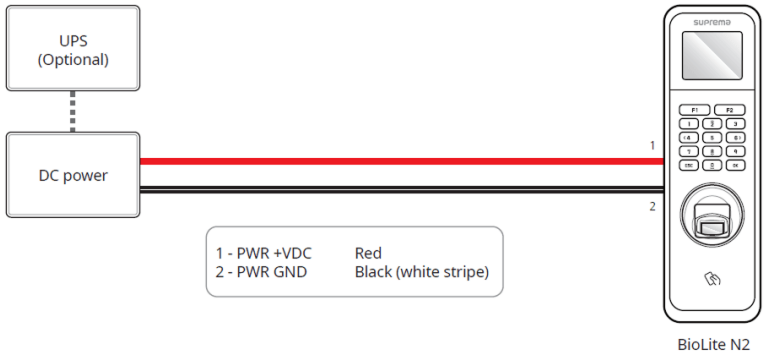
3. Rotate the fixing screws to assemble the product with the bracket.



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

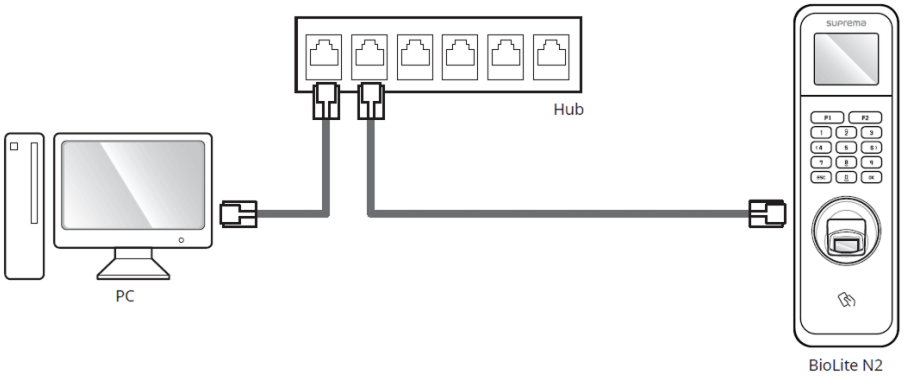
- Use the UL 60950-1/UL 62368-1 and UL 294, or equivalent LSS standard that includes supply line transient testing, approved power adapter that supports higher power consumption than the product. If you wish to connect and use another device to the power supply adapter, you should use an adapter with 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.

Network Connection

TCP/IP

LAN connection (connecting to a hub)

You can connect to a hub using a standard CAT-5 or higher cable.



LAN connection (connecting to a PC directly)

This product supports automatic MDI/MDIX, so it can connect directly to a PC using either a crossover cable or a standard straight CAT-5 or higher cable.



Network ports and services

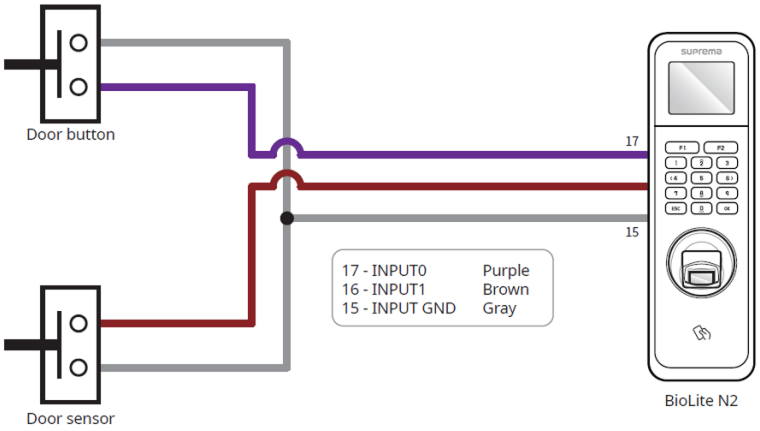
This device uses the following ports for network communication and stable service operation.

Protocol	Service
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.

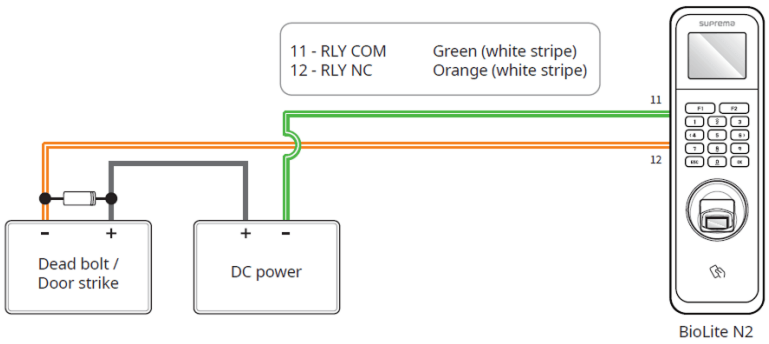
Input connection



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

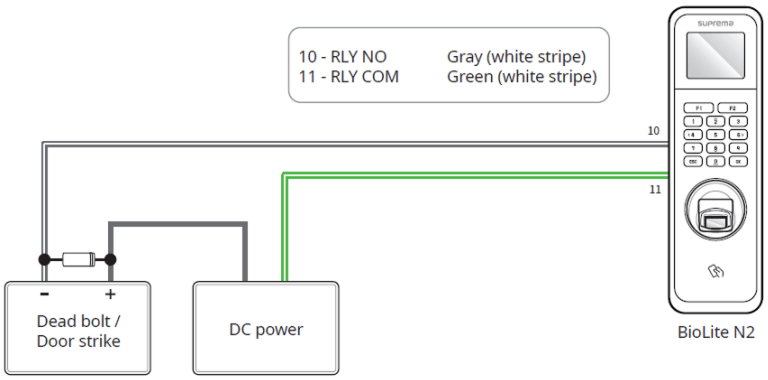
- Install a diode at both sides of the door lock wire as shown in the figure to protect the relay from the reverse current, which occurs when the door lock operates.
- Use a separate power supply for the product and the door lock.
- Suprema's standalone intelligent readers contain internal relays that 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.



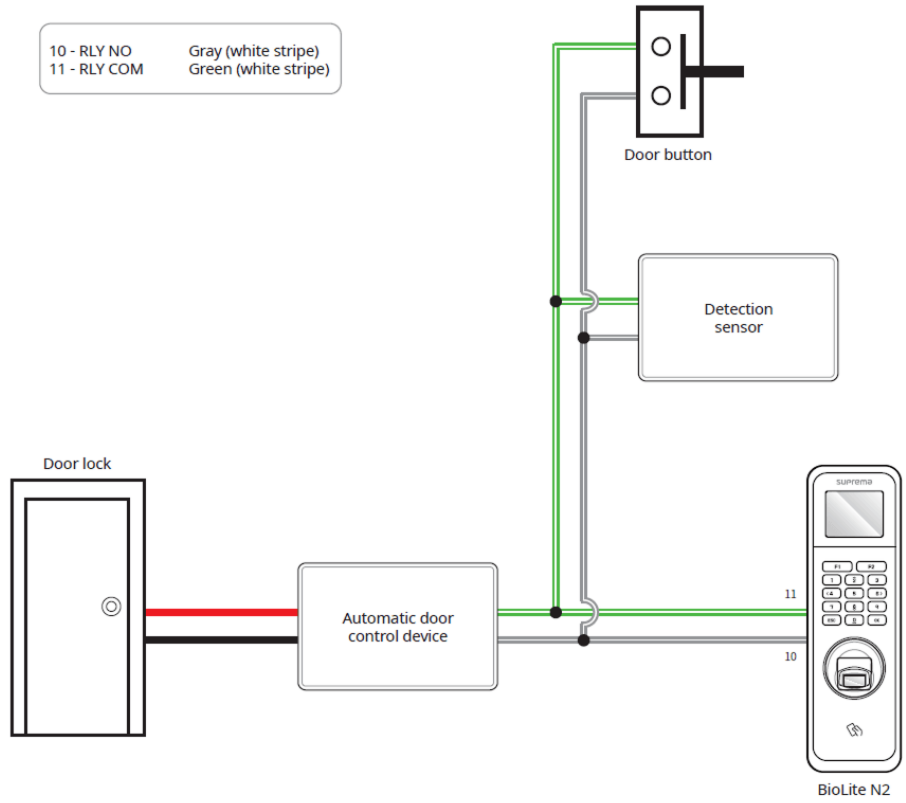
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Info

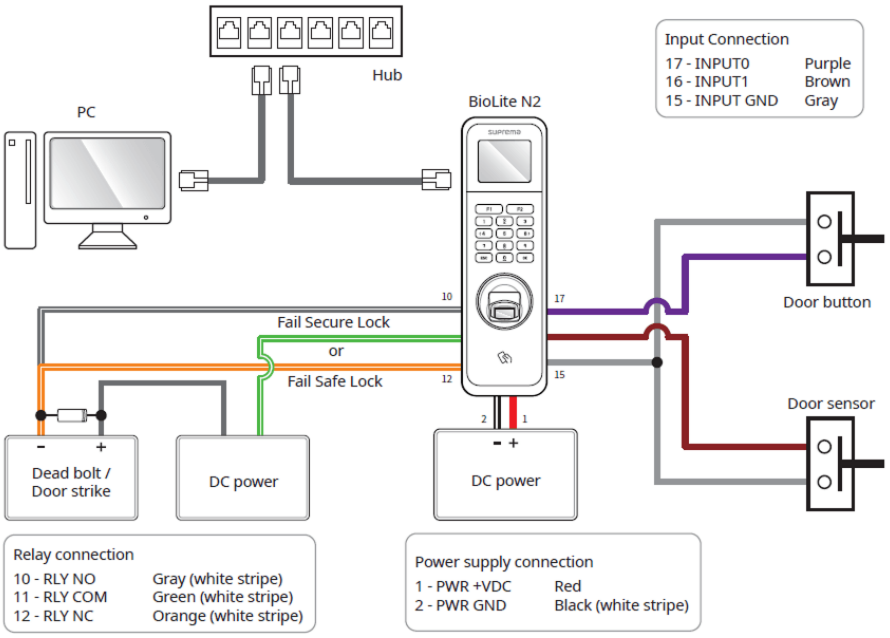
Take caution of the installation direction of the diode. Install the diode close to the door lock.

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

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.

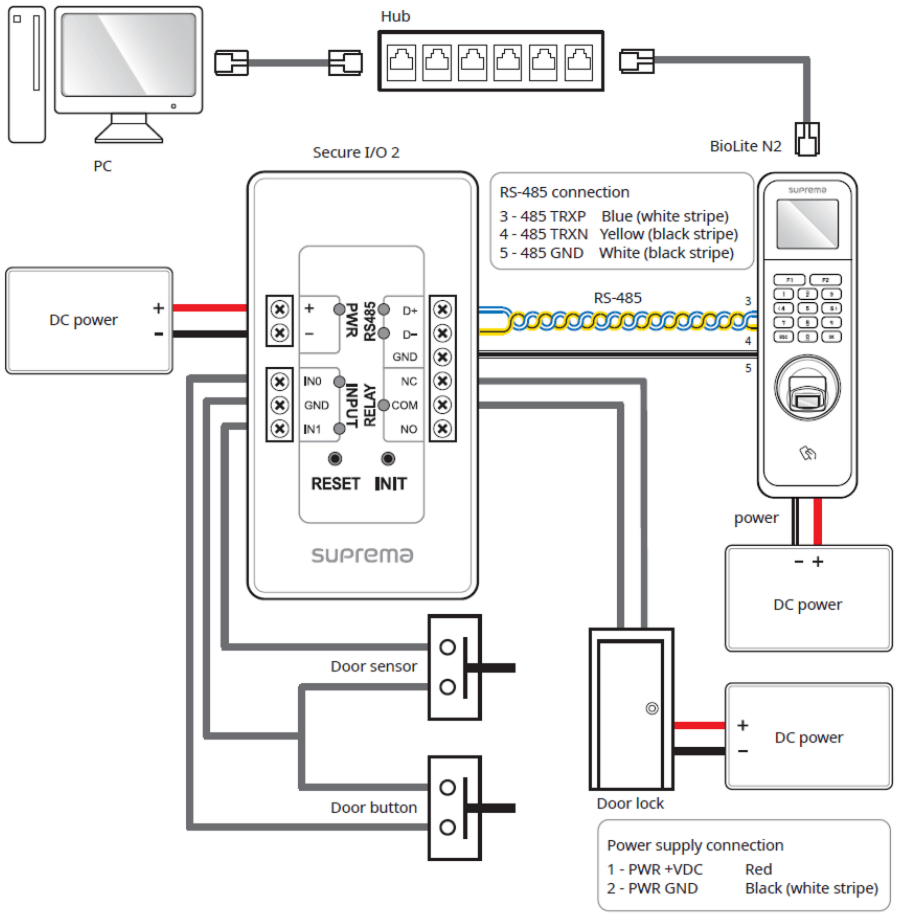
Info

- 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.

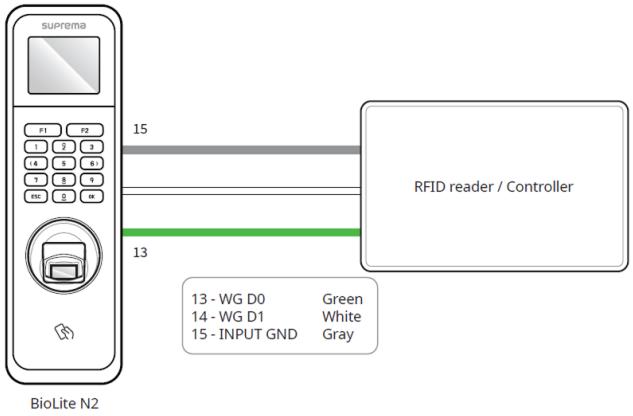


Info

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Wiegand Connection

Use as a Wiegand input or output device.



Firmware Version

You can view the firmware version of device.

1. Press **ESC** and authenticate with the Admin level credential.
2. Select **DEVICE** → **Device Info**, then press **6**. You can view the information **FW**.
3. To return to the previous screen, press **ESC**.

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 (SW-based)**	
RF Card	**BLN2-OD, BLN2-ODB**	**125kHz EM & 13.56MHz MIFARE, MIFARE Plus, DESFire, DESFire EV1/EV2/EV3, FeliCa**
	BLN2-OA, BLN2-OAB, BLN2-PAB	**125kHz EM, HID Prox & 13.56MHz MIFARE, MIFARE Plus, DESFire, DESFire EV1/EV2/EV3, FeliCa, iCLASS SE/SR/Seos**
RF Read Range[1)]	**MIFARE/DESFire/HID iCLASS: 50 mm, EM/HID Prox/FeliCa: 30 mm**	
Mobile	**BLN2-ODB, BLN2-OAB, BLN2-PAB**	**NFC, BLE**
	BLN2-OD, BLN2-OA	**NFC**

General

Model Name	**BLN2-ODB, BLN2-OAB, BLN2-PAB**
CPU	**1.2 GHz**
Memory	**4 GB Flash + 64 MB RAM**
Crypto Chip	**Supported**

Display	**1.77" color TFT LCD**	
Display Resolution	**160 x 128 pixels**	
Sound	**16 bit**	
Operating Temperature	**BLN2-ODB, BLN2-OAB, BLN2-OD, BLN2-OA**	**-20 °C ~ 50 °C**
	BLN2-PAB	**-10 °C ~ 50 °C**
Storage Temperature	**BLN2-ODB, BLN2-OAB, BLN2-OD, BLN2-OA**	**-40 °C ~ 70 °C**
	BLN2-PAB	**-20 °C ~ 60 °C**
Operating Humidity	**0 % ~ 80 %, non-condensing**	
Storage Humidity	**0 % ~ 90 %, non-condensing**	
IP Rating	**IP65, IP67**	
Authentication	**BLN2-ODB, BLN2-PAB, BLN2-OD, BLN2-OA**	**CE, UKCA, KC, FCC, IC, RCM, BIS, SIG, RoHS, REACH, WEEE**
	BLN2-OAB	**CE, UKCA, KC, FCC, IC, RCM, BIS, SIG, RoHS, REACH, WEEE, ETL Listed to UL 294**[2)]

Capacity

Max. User	**10,000**
Max. Credentials (1:N)	**Fingerprint: 10,000**
Max. Credentials (1:1)	• **Fingerprint: 10,000** • **Card: 10,000** • **PIN: 10,000**
Max. Text logs	**1,000,000**

Interface

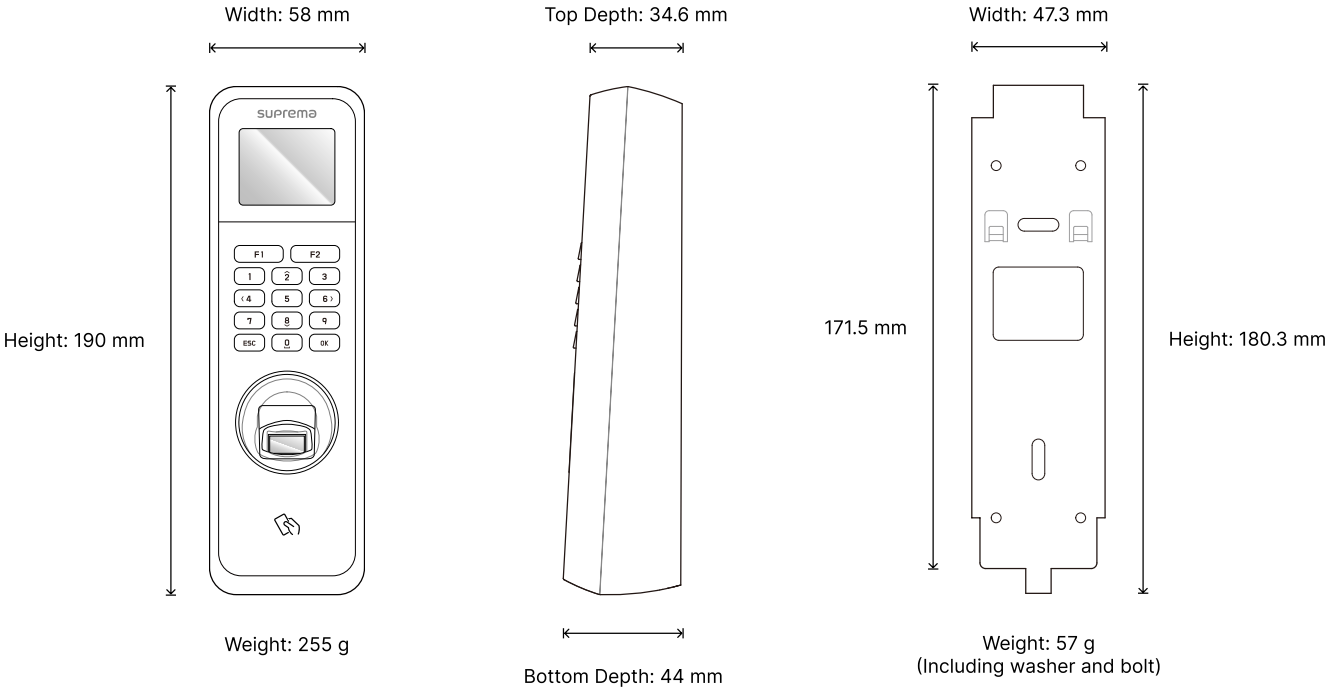
Ethernet	**Supported (10/100 Mbps, auto MDI/MDI-X)**
Network Protocol	**TCP, UDP**
RS-485	**1 ch Master / Slave (Selectable)**
RS-485 Communication Protocol	**OSDP V2 compliant**
Wiegand	**1 ch Input / 1 ch Output (Selectable)**
Input	**2 ch Inputs**
Relay	**1 relay**
Tamper	**Supported**

Electrical

Power	**12 Vdc**	**Current: Max. 0.4 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) The RF detection range may vary depending on the installation environment.

2) UL Safety Standard - Access Control Device
- Destructive attack - Level 1 / Line security - Level 1 / Endurance - Level 4 / Standby power- Level 1

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.

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: -7.9 dBm
- Bluetooth frequency: 2402~2480 MHz
- NFC frequency: 129.2 MHz
- RFID frequency: 13.56 MHz

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

Appendices

Includes legal notices contained in the product.

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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 4.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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