

# BioStation A2

## INSTALLATION GUIDE

Version 1.26

English

EN 101.00.BSA2 V1.26A

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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.

## Instructional icons



**Warning:** This symbol indicates situations that could result in death or severe injury.



**Caution:** This symbol indicates situations that may result in moderate injury or property damage.



**Note:** This symbol indicates notes or additional information.



## Warning

### Installation

**Do not install or repair the product arbitrarily.**

- This may result in electric shock, fire, or product damage.
- Damages caused by any modifications or failure to follow installation instructions can void your manufacturer's warranty.

**Do not install the product in a place with direct sunlight, moisture, dust, soot, or a gas leak.**

- This may result in electric shock or fire.

**Do not install the product in a location with heat from an electric heater.**

- This may result in fire due to overheating.

**Install the product in a dry location.**

- Humidity and liquids may result in electric shock or product damage.

**Do not install the product in a location where it will be affected by radio frequencies.**

- This may result in fire or product damage.

### Operation

**Keep the product dry.**

- Humidity and liquids may result in electric shock, fire, or product damage.

**Do not use damaged power supply adaptors, plugs, or loose electrical sockets.**

- Unsecured connections may cause electric shock or fire.

**Do not bend or damage the power cord.**

- This may result in electric shock or fire.



## Caution

### **Installation**

**Do not install the product under direct sunlight or UV light.**

- This may result in product damage, malfunction, discoloration, or deformation.

**Do not install the power supply cable in a location where people pass by.**

- This may result in injury or product damage.

**Do not install the product near magnetic objects, such as a magnet, TV, monitor (especially CRT), or speaker.**

- The product may malfunction.

**Keep the minimum distance between products when installing multiple products.**

- The product may be affected by radio frequencies emitted by other products and the product may malfunction.

**Use the IEC/EN 62368-1 approved power adaptor that supports higher power consumption than the product. It is highly recommended to use the power adaptor sold by Suprema.**

- If the right power supply is not used, the product may malfunction.

**Use a separate power supply for the Secure I/O 2, electric lock, and the product.**

- If connecting and using the same power supply, the product may malfunction.

**Do not connect and use the power supply and Power over Ethernet (PoE) simultaneously.**

- The product may malfunction.

**It is recommended to use the enclosure if the product is installed outside.**

### **Operation**

**Do not drop the product or cause impacts to the product.**

- The product may malfunction.

**Do not disconnect the power supply while upgrading the firmware of the product.**

- The product may malfunction.

**Do not disclose the password to others and change it regularly.**

- This may result in illegal intrusion.

**Do not press buttons on the product by force or do not press them with a sharp tool.**

- The product may malfunction.

**Do not store your product in very hot or very cold places. It is recommended to use your product at temperatures from -20 °C to 50 °C.**

- The product may malfunction.

**When cleaning the product, mind the following.**

- Wipe the product with a clean and dry towel.
- If you need to sanitize the product, moisten the cloth or the wipe with a proper amount of rubbing alcohol and gently clean all exposed surfaces including fingerprint sensor. Use rubbing alcohol (containing 70% Isopropyl alcohol) and a clean, non-abrasive cloth like lens wipe.
- Do not apply liquid directly to the surface of the product.

**BioStation A2 uses the capacitive button. If there is much moisture (humidity) like a rainy weather or on the product, wipe with a soft and dry cloth.**

**Do not use the product for anything other than its intended use.**

- The product may malfunction.

**RTC battery**

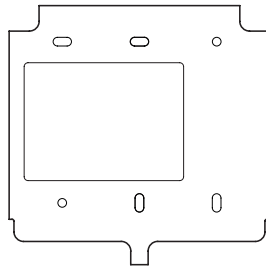
Discard the battery according to the appropriate regional or international waste regulations. Discard the battery according to the appropriate regional or international waste regulations.

# Introduction

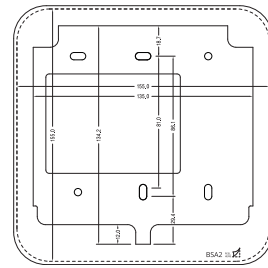
## Components



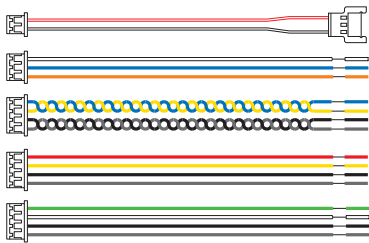
BioStation A2



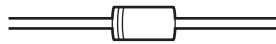
Wall Bracket



Drilling Template



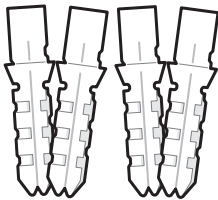
Cables



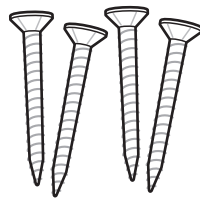
Diode



120  $\Omega$  resistor



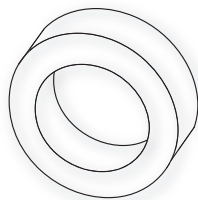
PVC Anchor x4



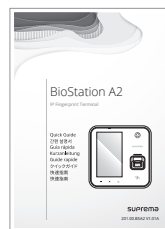
Fixing Screw x4



Bracket Fixing Screw  
(Star Shaped)



Ferrite Core



Quick Guide

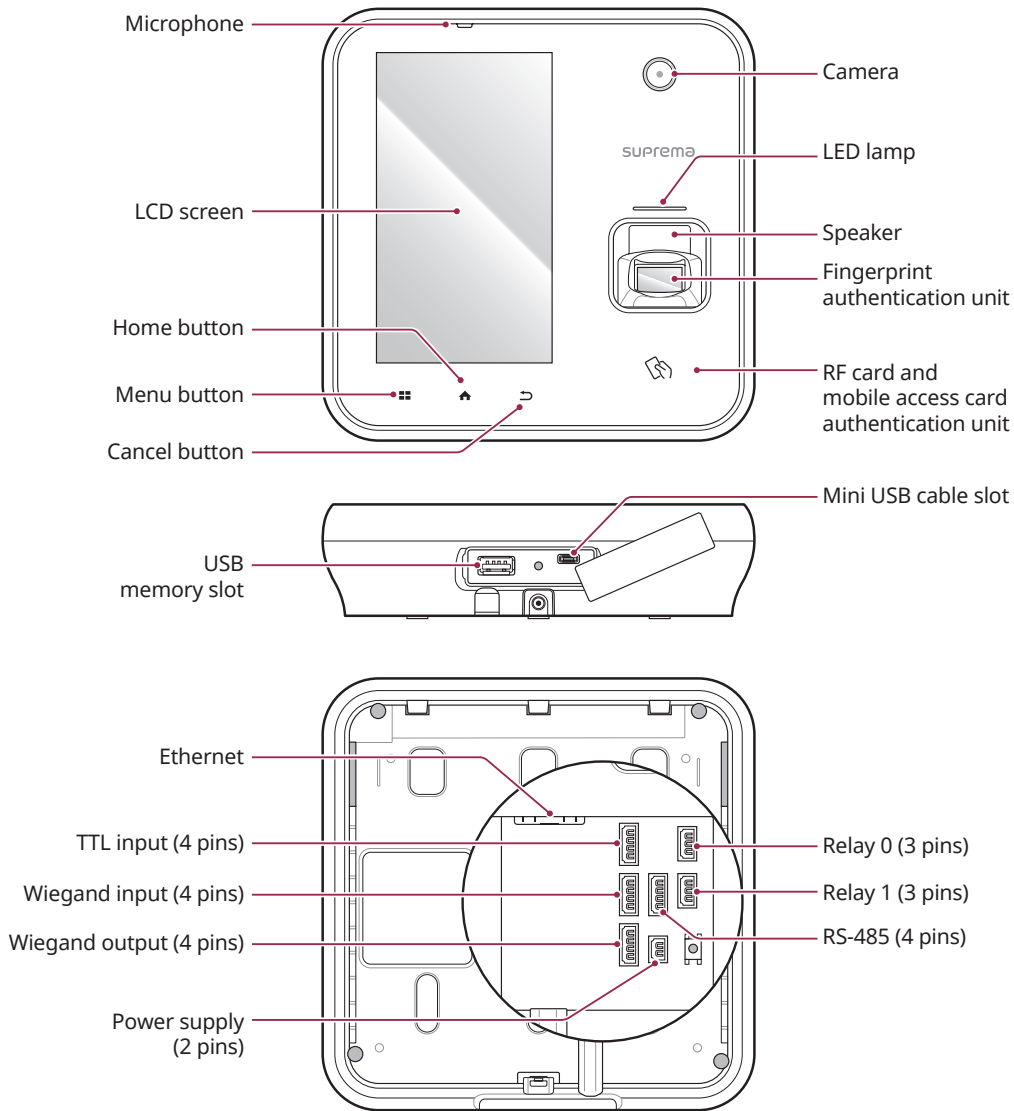


Open Source Software Guide



- 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.
- For more details regarding the product, visit the Suprema website (<https://www.supremainc.com>) and refer to the user guide.

## Name and function of each part



Name	Description
<b>Microphone</b>	Delivers the voice of the user when the interphone is connected.
<b>LCD screen</b>	Provides UI for operation.
<b>Menu button</b> (☰)	Displays the list of menus.
<b>Home button</b> (🏠)	Navigates to the home screen.
<b>Cancel button</b> (↶)	Navigates back to the previous screen.
<b>Speaker</b>	Delivers sound.
<b>LED lamp</b>	Indicates the operational status of the product with the color of the LED lamp.
<b>Fingerprint authentication unit</b>	Part to scan the fingerprint for entrance.
<b>RF card and mobile access card authentication unit</b>	Part to scan a RFID card or mobile access card for entrance.
<b>USB memory slot</b>	Connects USB memory.
<b>Mini USB cable slot</b>	Will be supported in the future.
<b>TTL input (4 pins)</b>	Connects the TTL input cable.
<b>RS-485 (4 pins)</b>	Connects the RS-485 cable.

Relay (3 pins)	Connects the relay cable.
Power supply (2 pins)	Connects the power supply cable.
Ethernet	Connects the Ethernet cable.
Wiegand input (4 pins)	Connects the Wiegand input cable.
Wiegand output (4 pins)	Connects the Wiegand output cable.

## Cables and connectors

### Power supply



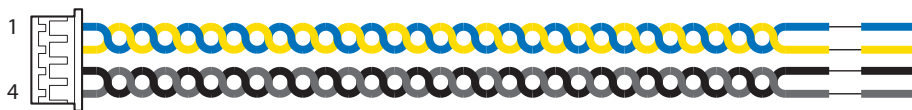
PIN	Name	Color
1	PWR +VDC	Red (white stripe)
2	PWR GND	Black (white stripe)

### Relay



PIN	Name	Color
1	RLY NO	White
2	RLY COM	Blue
3	RLY NC	Orange

### RS-485



PIN	Name	Color
1	485 TRXP	Blue
2	485 TRXN	Yellow
3	485 GND	Black
4	SH GND	Gray



## TTL input



PIN	Name	Color
1	TTL IN0	Red
2	TTL IN1	Yellow
3	TTL GND	Black
4	SH GND	Gray

## Wiegand input and output



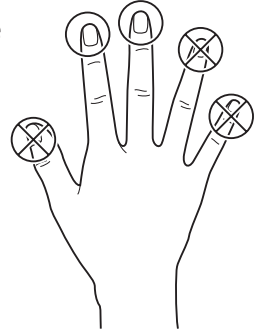
PIN	Name	Color
1	WG D0	Green
2	WG D1	White
3	WG GND	Black
4	SH GND	Gray

## How to enroll a fingerprint

In order to improve the fingerprint authentication rate, register the fingerprint correctly. BioStation A2 can recognize a fingerprint even if the angle and position of a user's fingerprint input change. If you register the fingerprint with attention to the following matters, the authentication rate can be improved.

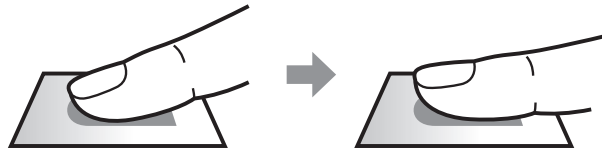
### Selecting a finger for fingerprint input

- 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 registered.
- 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 a message saying "Place your finger on the sensor." is displayed on the LCD screen for enrolling the fingerprint, place the finger with the fingerprint you wish to enroll on the fingerprint authentication unit and press the finger gently for better authentication.



- 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 enrolling a fingerprint

When a fingerprint is recognized, it is compared with the initially registered 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.



#### When the fingerprint recognition fails

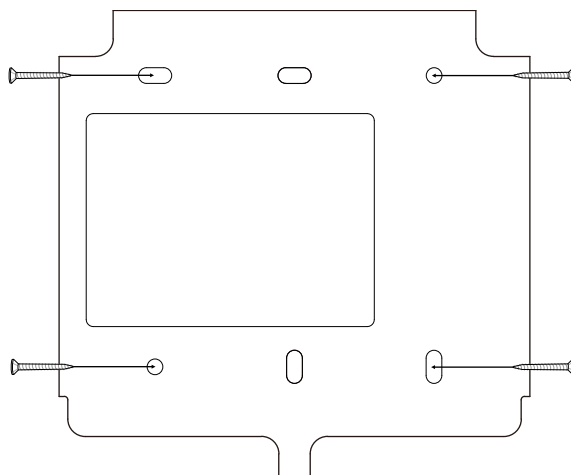
BioStation A2 can recognize a fingerprint regardless of a change in season or finger condition. However, the authentication rate may vary according to the external environment or fingerprint input method. If the fingerprint authentication cannot be done smoothly, it is recommended to take the following 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, register the fingerprint of another finger.
- The initially enrolled fingerprint often may have not been scanned correctly, so enroll the fingerprint again according to 'Cautions for enrolling a fingerprint'.

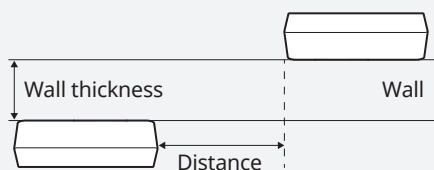
# Installation

## Fixing the bracket and the product

- 1 Determine the correct position to install the bracket using the provided drilling template. Fix the bracket firmly using fixing screws through the bracket to the position where BioStation A2 will be installed.

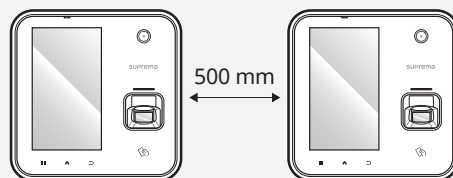


- If installing BioStation A2 on a concrete wall, drill holes, insert PVC anchors, and fix them with fixing screws.
- To avoid RF interference, a minimum separation distance must be maintained.



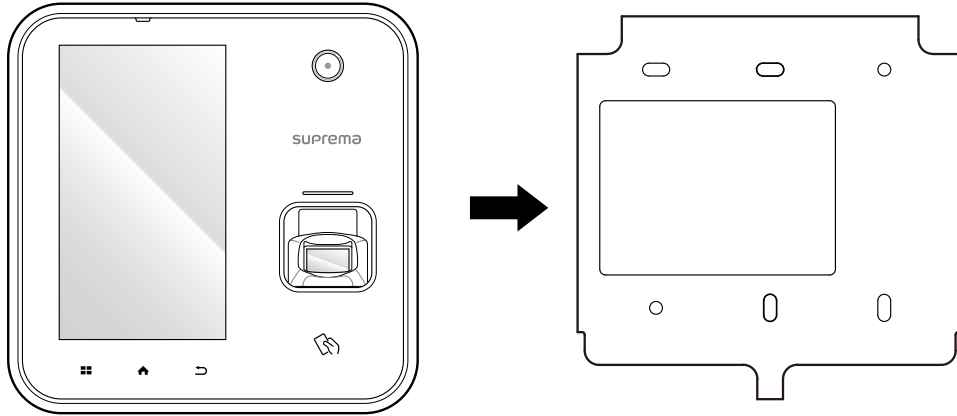
Wall thickness	Distance
100 mm	500 mm
120 mm	400 mm
150 mm	300 mm

Wall

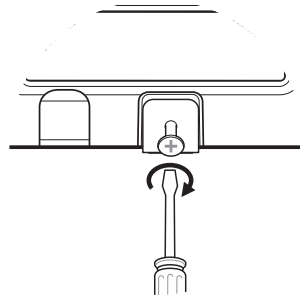


- When using a mobile access card, install devices maintaining a minimum distance of 1 m between devices to avoid RF interference.

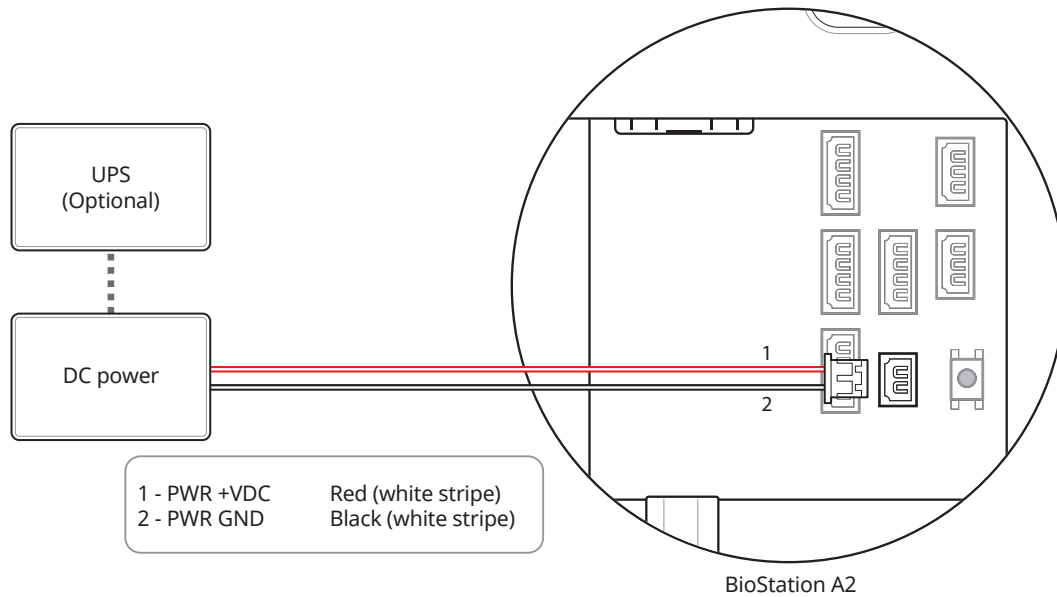
**2** Install BioStation A2 onto the fixed bracket.



**3** Connect BioStation A2 to the bracket by rotating the product fixing screw of BioStation A2.



## Power supply connection



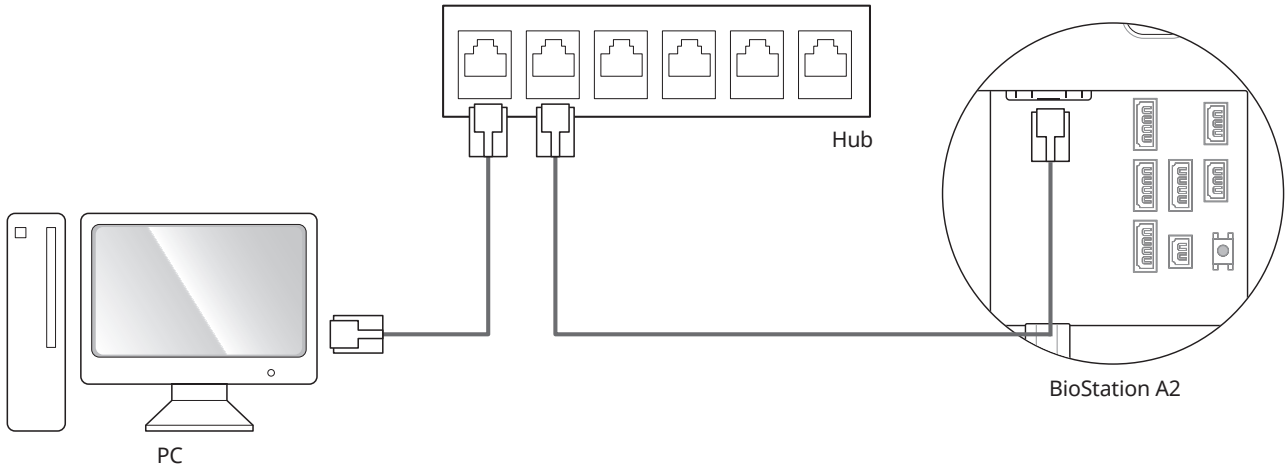
- Use the IEC/EN 62368-1 approved power adaptor that supports higher power consumption than the product. If you wish to connect and use another device to the power supply adaptor, you should use an adaptor with a current capacity which is the same or larger than the total power consumption required for the terminal and another device.
- 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 connect the device to the DC power supply (or adaptor) and PoE power supply at the same time.

## Network connection

### TCP/IP

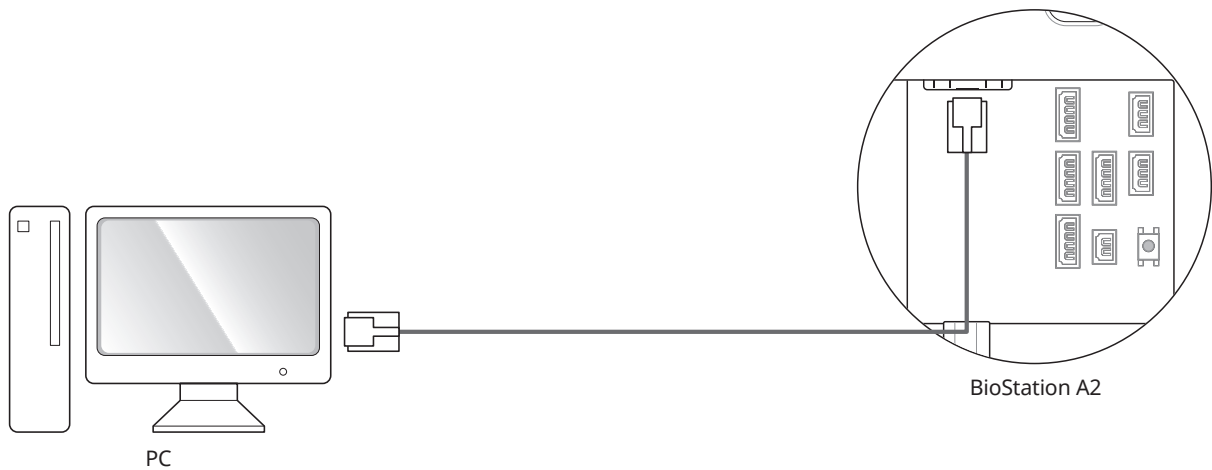
#### LAN connection (connecting to a hub)

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

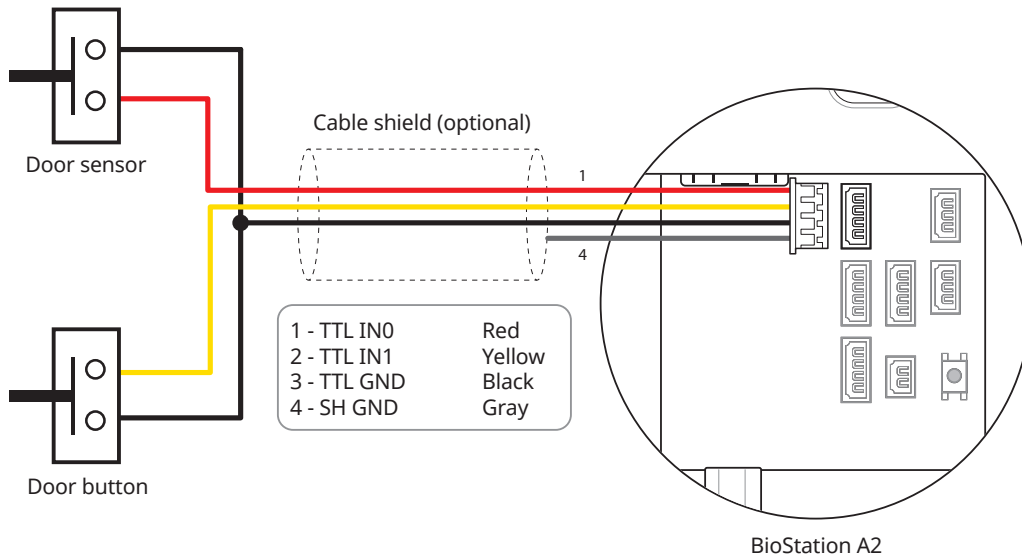


#### LAN connection (connecting to a PC directly)

BioStation A2 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.



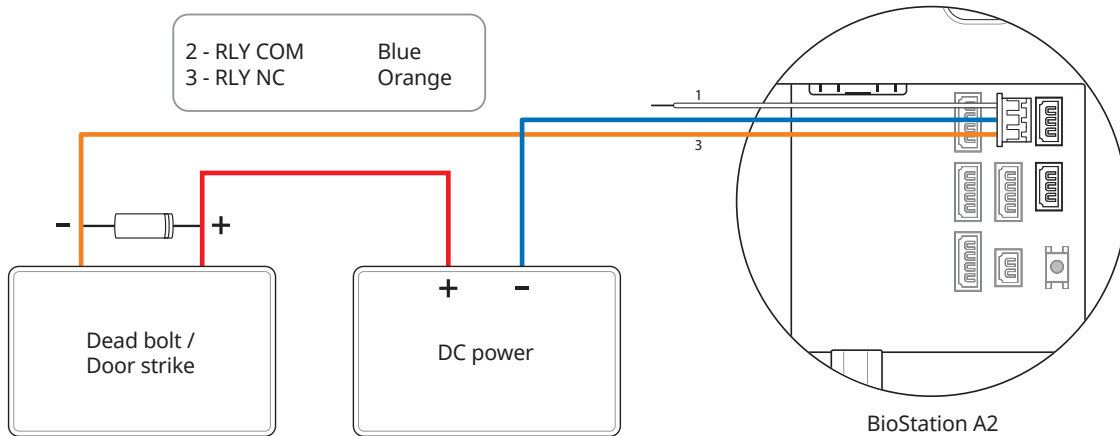
## TTL input connection



## 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.



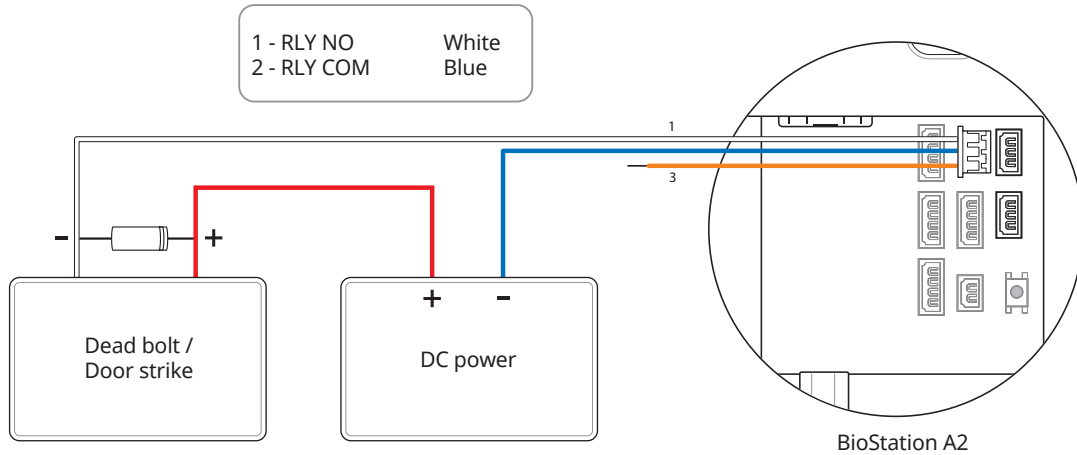
- Install a diode at both sides of the door lock wire as shown in the figure to protect the relay from the reverse current, which occurs when the door lock operates.
- Use a separate power supply for BioStation A2 and the door lock.
- Suprema's standalone intelligent readers contain internal relays that 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.



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.



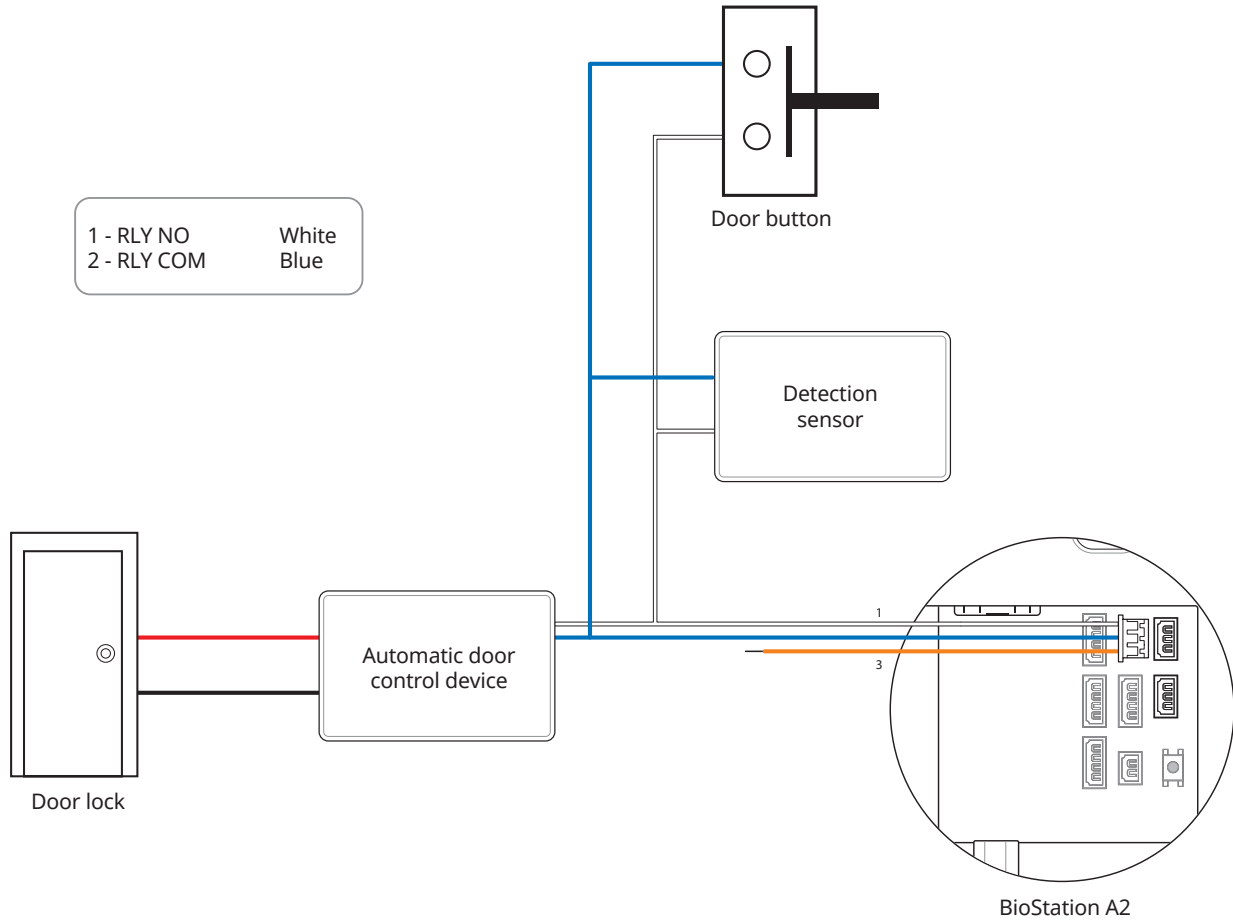
- Install a diode at both sides of the door lock wire as shown in the figure to protect the relay from the reverse current, which occurs when the door lock operates.
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Take caution of the installation direction of the diode. Install the diode close to the door lock.

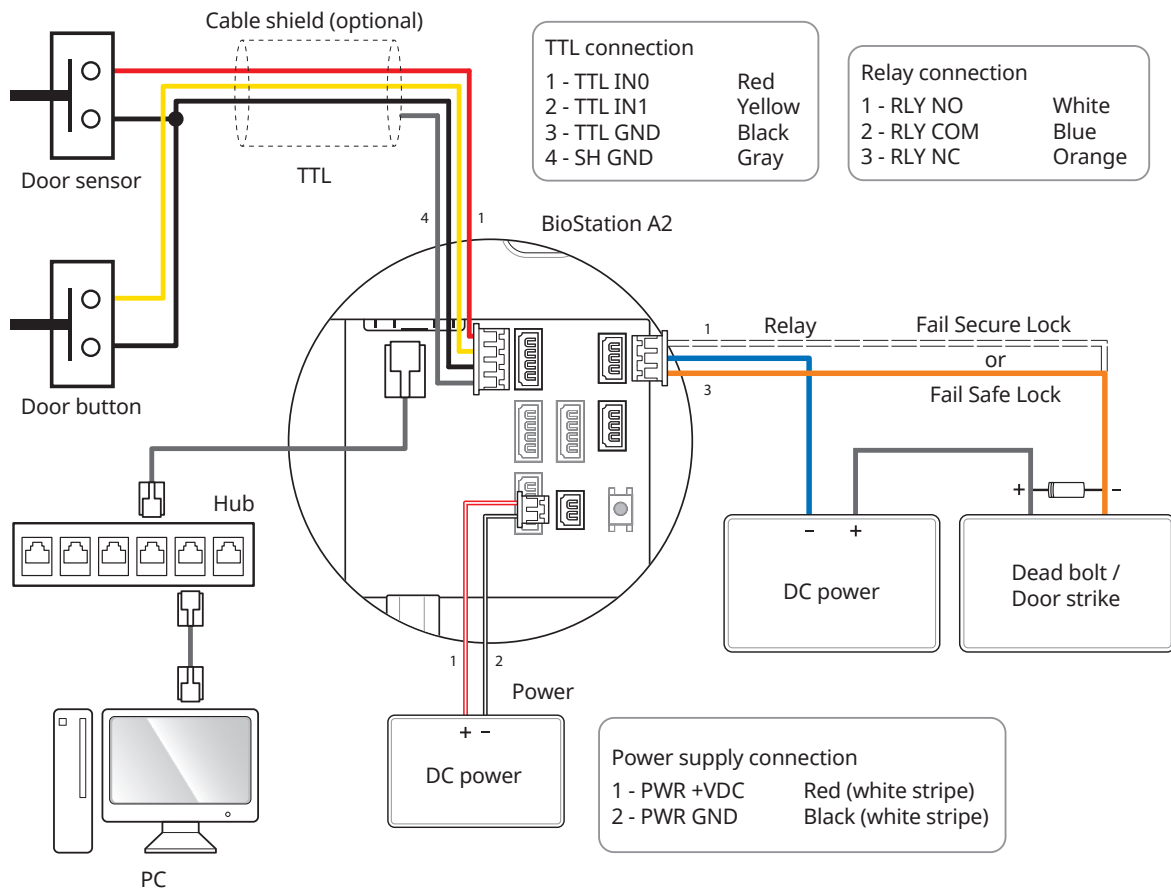


# Automatic door connection



## Connecting as a standalone

BioStation A2 can be connected to the door lock, door button, and door sensor directly without connecting a separate I/O device.



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.

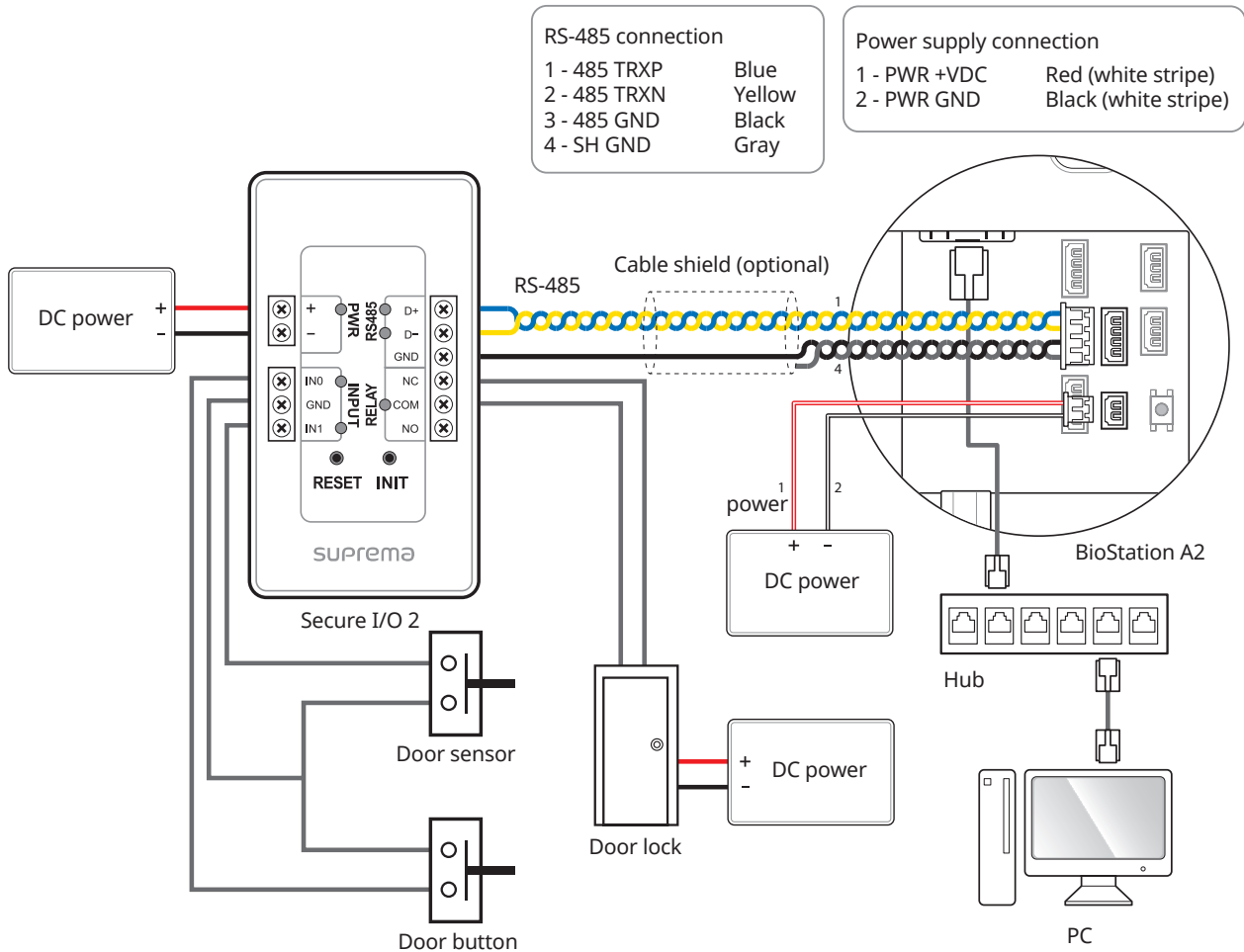


- BioStation A2 can be used as a multi-door controller with the slave devices with the RS485 cable. The slave devices are used as dummy readers and authentication is performed in the master device.
- If Xpass or Xpass 2 is connected to the master device, only card authentication can be used.
- The maximum 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 fingerprint authentication speed.
- A master device can control 31 slave devices. The bandwidth of RS485 allows for up to 7 fingerprint authentication devices to be connected.
- For more information, contact the Suprema technical support team ([support.supremainc.com](http://support.supremainc.com)).

## Connecting to Secure I/O 2

Secure I/O 2 is an I/O device, can be connected to BioStation A2 with the RS-485 cable. Security can be maintained even if the connection between BioStation A2 and Secure I/O 2 has been lost or the power supply to BioStation A2 has been shut off due to external factors.

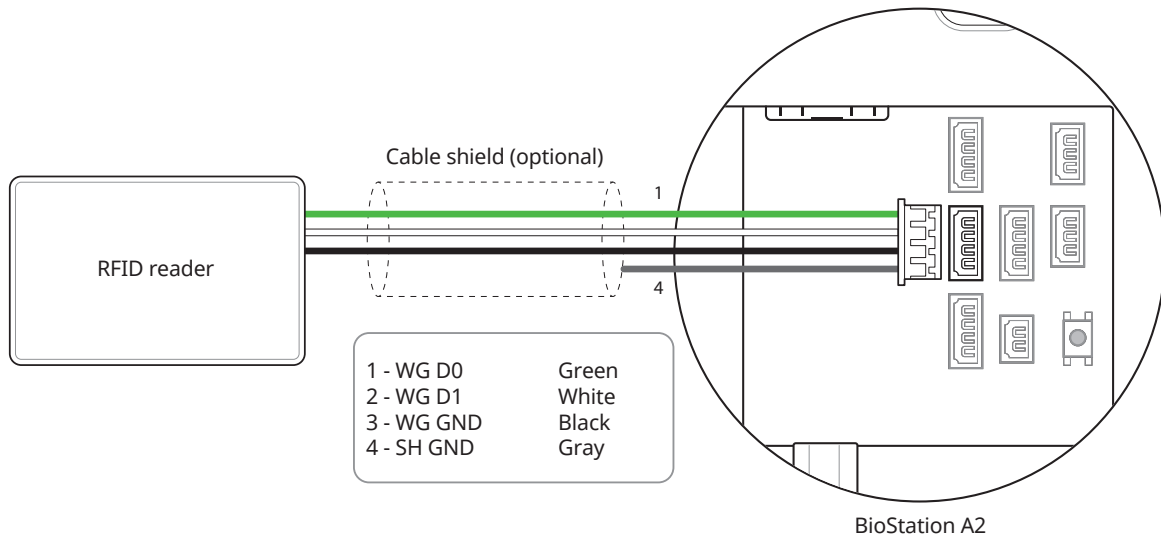
- Use an AWG24 twisted pair with less than 1.2 km in length for the RS-485 cable.
- If connecting with a RS-485 daisy chain, connect the termination resistor (120 Ω) to both ends of the daisy chain connection. If connected to the middle line, the signal level becomes smaller and the communication performance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



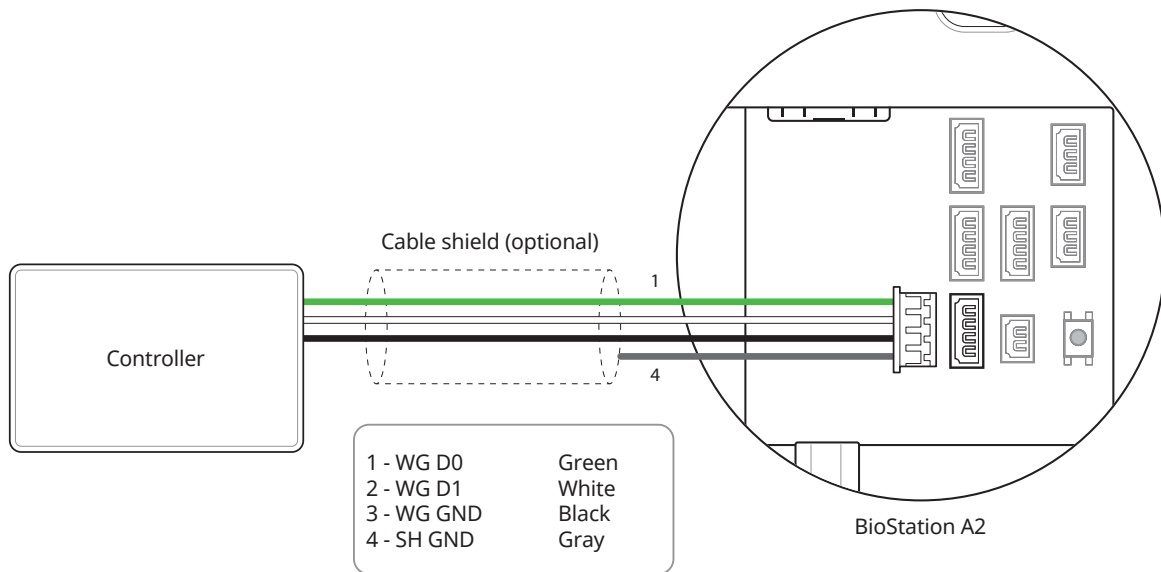
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- If Xpass or Xpass 2 is connected to the master device, only card authentication can be used.
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# Wiegand connection

Use as a Wiegand input device



Use as a Wiegand output device



# Product specifications

Category	Feature	Specification	
Credential	Biometric	Fingerprint	
	RF Option	<ul style="list-style-type: none"> <li>• <b>BSA2-OEPW:</b> 125kHz EM</li> <li>• <b>BSA2-OHPW:</b> 125kHz HID Prox</li> <li>• <b>BSA2-OIPW:</b> 13.56MHz iCLASS SE/SR/Seos</li> <li>• <b>BSA2-OMPW:</b> 13.56MHz MIFARE, MIFARE Plus, DESFire EV1/EV2*, FeliCa</li> </ul>	
	RF read range**	EM/HID Prox, MIFARE, DESFire: 50 mm, FeliCa: 30 mm	
General	Mobile	NFC (BSA2-OIPW, BSA2-OMPW)	
	CPU	1.0 GHz Quad Core	
	Memory	8GB Flash + 1GB RAM	
	Crypto chip	Supported	
	LCD type	5" color TFT touch	
	LCD resolution	480 x 854	
	LED	Multiple colors	
	Sound	24 bit/Voice DSP (echo cancel)	
	Operating temperature	-20°C–50°C	
	Storage temperature	-40°C–70°C	
	Operating humidity	0 %–80 %, non-condensing	
	Storage humidity	0 %–90 %, non-condensing	
	Camera type	CMOS 2M pixels	
	Camera resolution	1600 x 1200	
	Camera angle	Diagonal 122°, Horizontal 64.7°, Vertical 103.3°	
	Dimension (W x H x D)	155 mm x 155 mm x 40 mm	
	Weight	<ul style="list-style-type: none"> <li>• Device: 440 g</li> <li>• Bracket (Including washer and bolt): 89 g</li> </ul>	
	Certificates	CE, FCC, KC, RoHS, REACH, WEEE	
	Fingerprint	Image dimension	272 x 320 pixels
		Image bit depth	8 bits, 256 gray scale
Resolution		500 dpi	
Template		SUPREMA / ISO19794-2 / ANSI-378	
Extractor / Matcher		MINEX certified and compliant	
Live Fingerprint Detection		Supported	
Capacity	Max. User	500,000***	
	Max. Credential (1:N)	Fingerprint: 100,000	
	Max. Credential (1:1)	<ul style="list-style-type: none"> <li>• Fingerprint: 500,000</li> <li>• Card: 500,000</li> <li>• PIN: 500,000</li> </ul>	
	Max. Text Log	5,000,000	
	Max. Image Log	50,000	
Interface	Wi-Fi	Supported	
	Ethernet	Supported (10/100 Mbps, auto MDI/MDI-X)	
	RS-485	1ch Host or Slave (Selectable)	
	Wiegand	1ch Input, 1ch Output	
	TTL input	1ch Input	
	Relay	2 Relay	
	USB	USB 2.0 (Host)	
	SD Card	microSD card (Supports up to 32 GB) * The functions of the SD card are available by customization only.	
	PoE	Supported (IEEE 802.3af compliant)	
	Tamper	Supported	

Electrical	Power	Voltage: DC 12 V / Current: Max. 1 A
	Switch input VIH	Min.: 3 V / Max.: 5 V
	Switch input VIL	Max.: 1 V
	Switch Pull-up resistance	4.7 k $\Omega$ (The input pots are pulled up with 4.7 k $\Omega$ .)
	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 k $\Omega$
	Relay	2 A @ 30 VDC Resistive load 1 A @ 30 VDC Inductive load

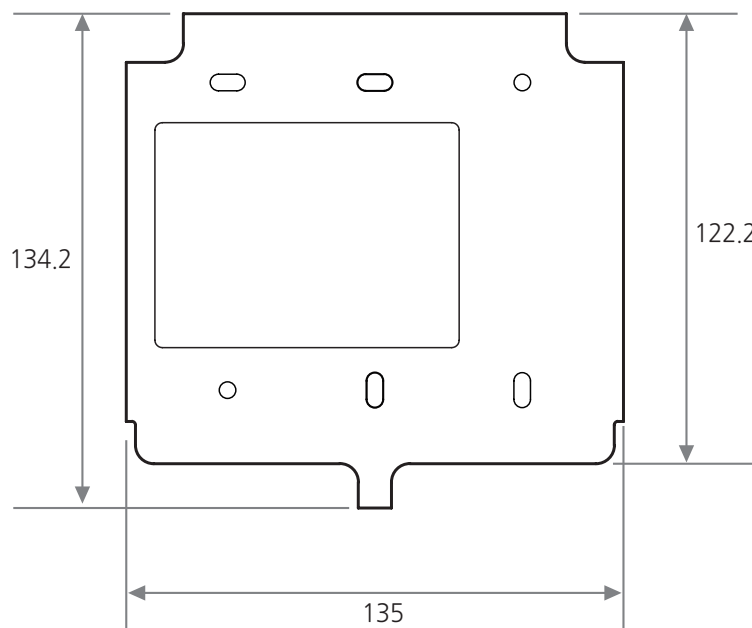
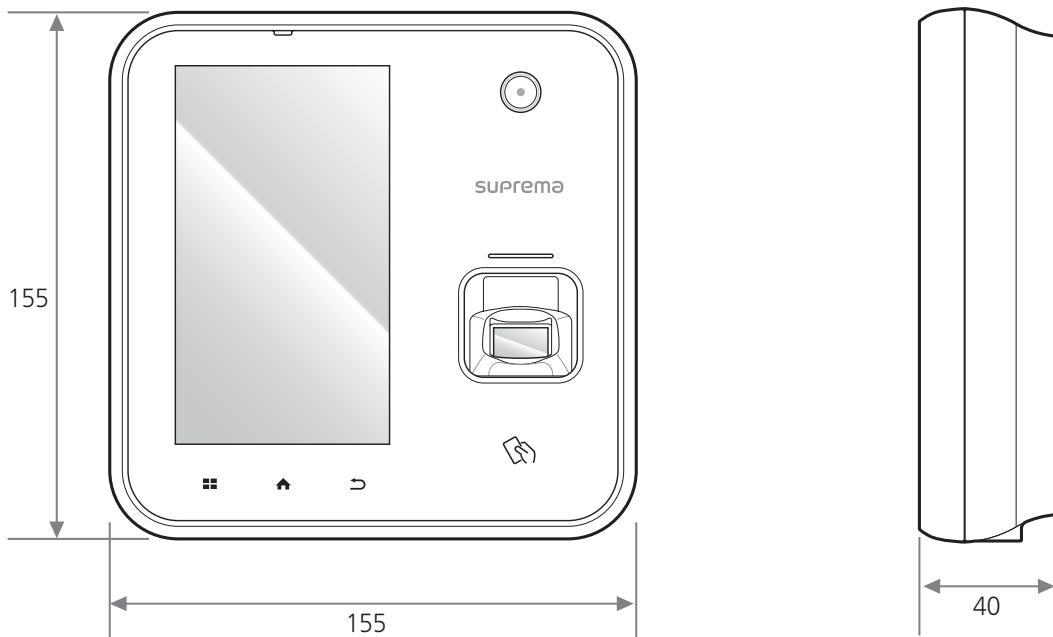
\* DESFire EV2 cards are supported by having backward compatibility of DESFire EV1 cards. CSN and smart card functions are compatible with BioStation A2.

\*\* RF read range will vary depending on installation environment.

\*\*\* The number of users registered without any credential data

## Dimensions

(Unit: mm)



## 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.



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. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

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- NFC Frequency: 13.56 MHz
- RFID Frequency: 13.56 MHz + 125 kHz

For more information, contact us at the following contact information.

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Version 3, 29 June 2007

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