# BioEntry R2

## INSTALLATION GUIDE

Version 1.05

English
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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 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.

## 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 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**.

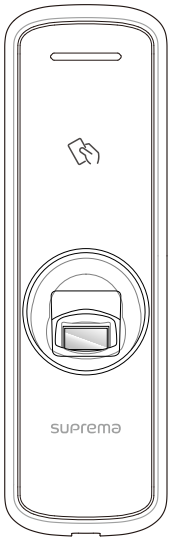
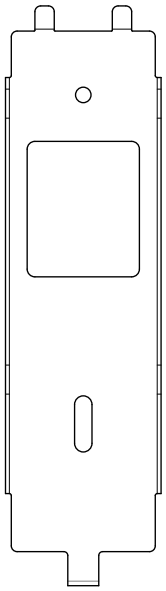
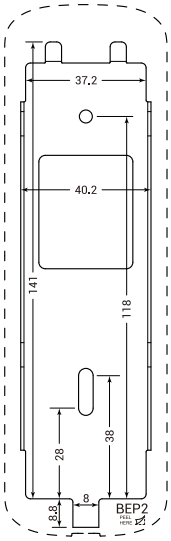
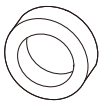
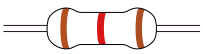
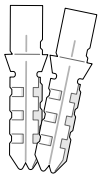
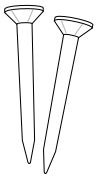
- The device may malfunction.

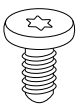
> **RTC Battery**
>
> Replacing with unauthorized or incorrect types of batteries may pose a risk of explosion. Dispose of batteries according to local or international waste regulations.

# Getting Started

Provides initial procedures for getting started with the device.

## Components

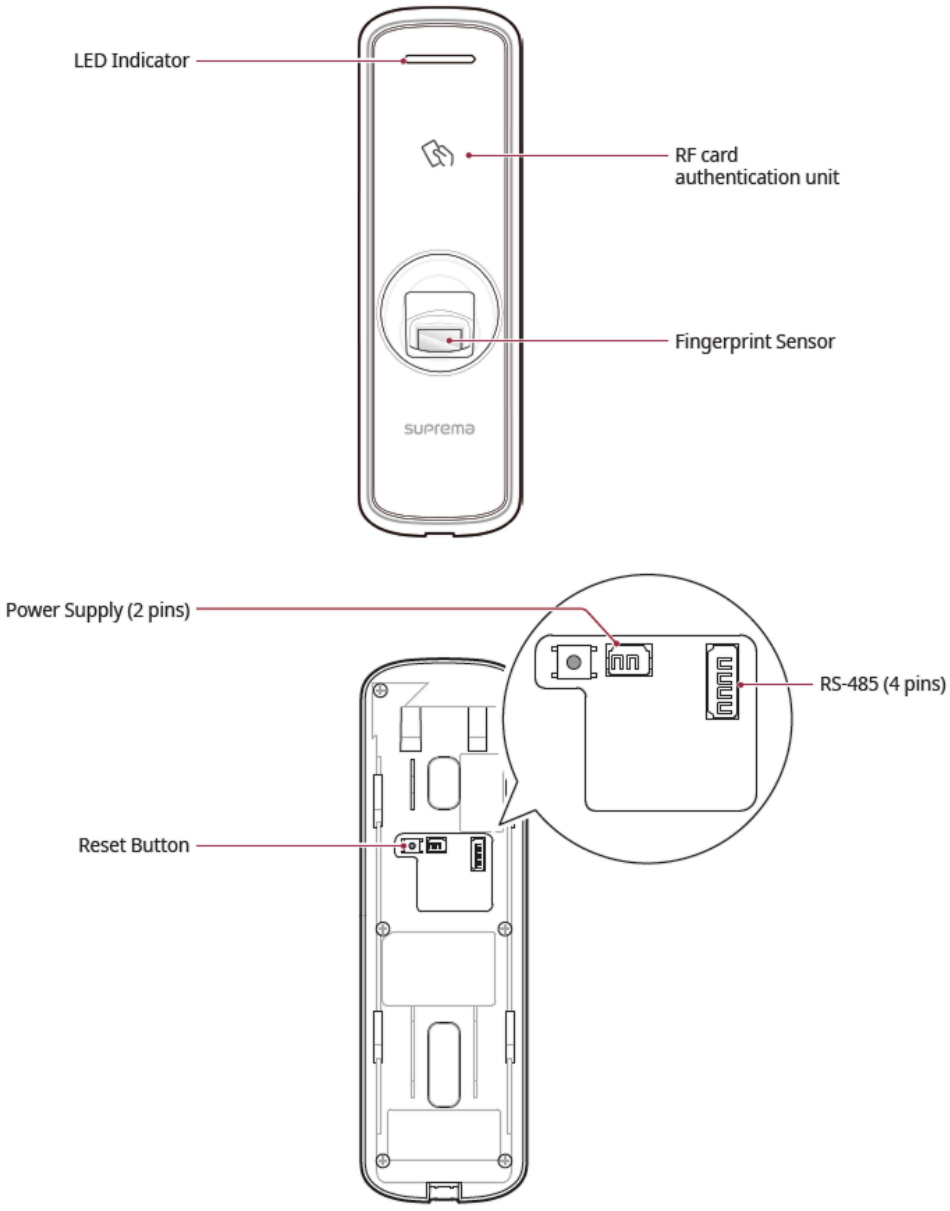
| | | | |
|---|---|---|---|
|  |  |  |  |
| BioEntry R2 | Wall Bracket | Drilling Template | Connection Cables |
|  |  |  |  |
| Ferrite Core | 120 Ω Resistor | PVC Anchors x2 | Fixing Screws x2 |

| | | |
|---|---|---|
|  |  |  |
| Bracket Fixing Screw (Star Shaped) | Quick Guide | Open Source Software Guide |

**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.
  - Green blinking: Waiting for input.

- **RF Card Recognition Part**: This is the part that recognizes RF cards for access.
- **Fingerprint Recognition Unit**: The part that recognizes the fingerprint for access.
- **Power Supply (2-pin)**: Connects the power supply cable.
- **RS-485 (4-pin)**: Connect the RS-485 cable.
- **Reset Button**
  - Initialize RS-485 connection. For more information on initializing RS-485 connection, refer to Initialize RS-485 connection.
  - Deletes all information and certificates stored on the device and initializes the settings. For more information on factory initialization, refer to Factory default.

# Cables and connectors

## Power



| Pin | Name | Color |
|---|---|---|
| 1 | PWR +VDC | Red (White stripe) |
| 2 | PWR GND | Black (White stripe) |

## RS-485

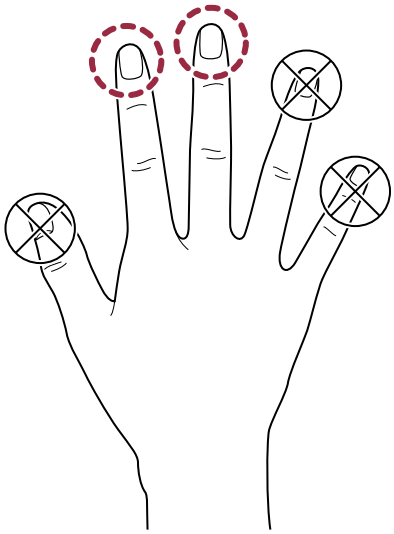


| Pin | Name | Color |
|---|---|---|
| 1 | 485 TRXP | Blue |
| 2 | 485 TRXN | Yellow |
| 3 | 485 GND | Black |
| 4 | SH GND | Gray |

# 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.

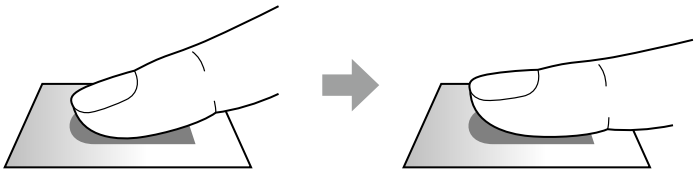
## Selecting a finger for fingerprint input



- 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

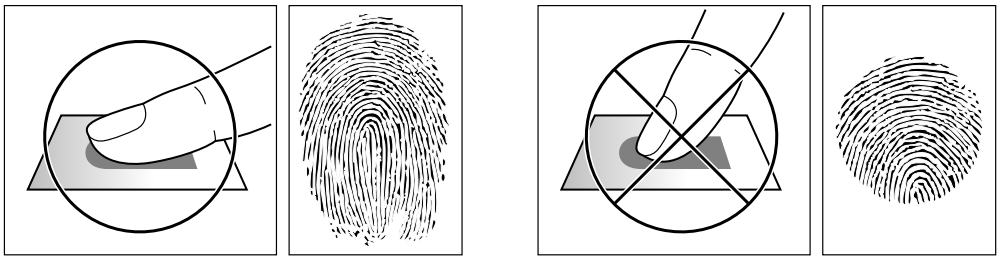
1. Place the finger you want to enroll on the fingerprint recognition unit and gently press it so that the fingerprint is authenticated well.



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.

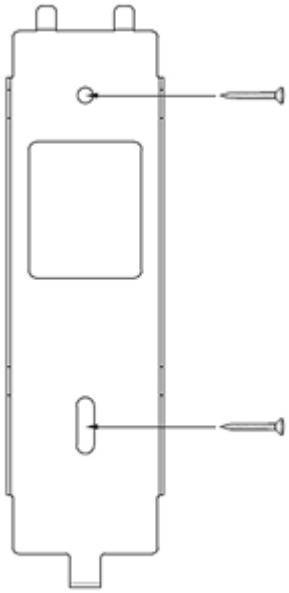
- If the finger is smeared with water or sweat, dry off the finger and then scan the finger.
- If the finger is too dry, blow your breath on the fingertips and then scan the finger.
- If the finger has a cut, enroll the fingerprint of another finger.
- Since the initially enrolled fingerprint is often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

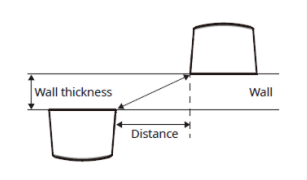
## Fixing the bracket and the product

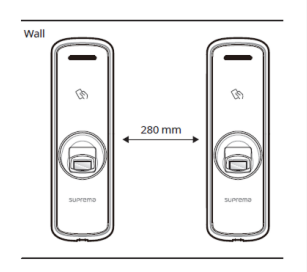
1. Determine the correct position to install the bracket using the provided drilling template. Secure the bracket tightly using the fixing screws at the location where the product will be mounted.



**Info**

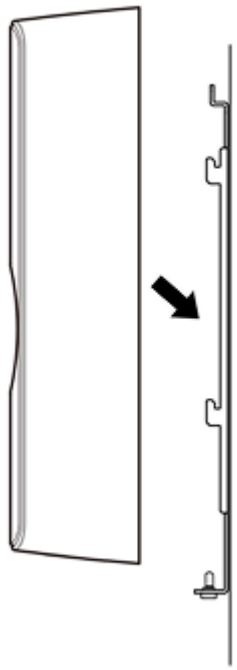
- If installing the product on a concrete wall, drill a hole, insert a PVC anchor, and secure it with a fixing screw.
- To avoid RF interference, a minimum separation distance must be maintained.




| Wall thickness | Distance |
|---|---|
| 100 mm | 250 mm |
| 120 mm | 250 mm |
| 150 mm | 180 mm |

2. Mount the product on the fixed bracket.



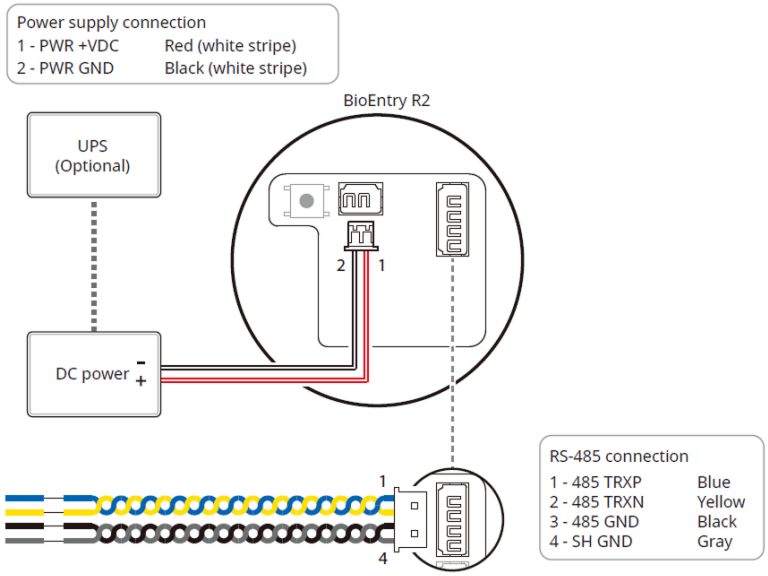
3. Rotate the fixing screws to assemble the product with the bracket.



**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 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.
- DO NOT extend the length of power cable when using the power adapter.
- 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.
- 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.
- If XPass or XPass 2 is connected to the master device, only card authentication can be used.

# Initialize RS-485 connection

1. Power on.
2. Press the reset button for more than 1 second. The LED appears green.
3. When you hear a beep, the RS-485 connection initialization is complete.

> **Info**
> If you want to connect a device already connected to the master device to another master device, you must initialize the RS-485 connection of that device.

# Reset RS-485 transmission performance

You can choose and set the desired communication performance.

1. Power on.
2. Press the reset button for more than 2 seconds. When you enter setting mode, the LED flashes green.
3. When the device's LED flashes green, press the reset button as many times as desired. The transmission performance is set according to the number of presses, and you can check the set performance by the LED color.

| Number of presses | Transmission performance | LED color |
|---|---|---|
| 1 | 9600 | Sky blue |
| 2 | 19200 | Blue |
| 3 | 38400 | Purple |
| 4 | 57600 | White |
| 5 | 115200 | Red |

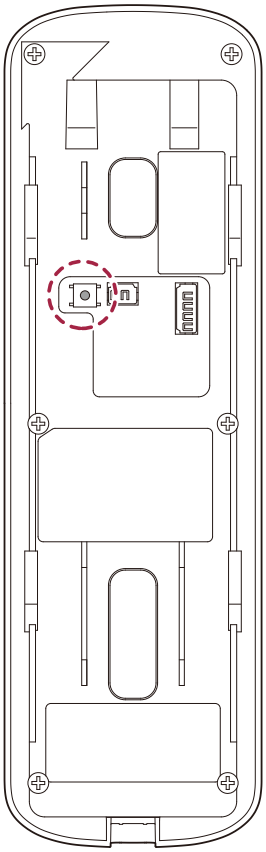
4. The LED color of the set transmission performance flashes for 5 seconds. When you hear a beep, the transmission performance setting is complete.

> **Info**
> If you do not press the reset button after entering setting mode, the transmission performance will automatically be set to 115200.

# 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**<br>• **Image Dimension:272 x 320 pixels**<br>• **Image Bit Depth:8 bits, 256 grayscale**<br>• **Resolution:500 dpi**<br>• **Template:SUPREMA / ISO19794-2 / ANSI-378**<br>• **Extractor / Matcher:MINEX certified and compliant** |
| RF Card | **125kHz EM & 13.56MHz MIFARE, MIFARE Plus, DESFire, DESFire EV1/EV2/EV3[1)], FeliCa** |
| RF Read Range[2)] | **MIFARE/DESFire: 50 mm, EM/Felica: 30 mm** |
| Mobile | **NFC** |

## General

| | |
|---|---|
| CPU | **1.0 GHz** |
| Memory | **32 MB Flash + 32 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** |
| Authentication | **CE, UKCA, KC, FCC, RoHS, REACH, WEEE** |

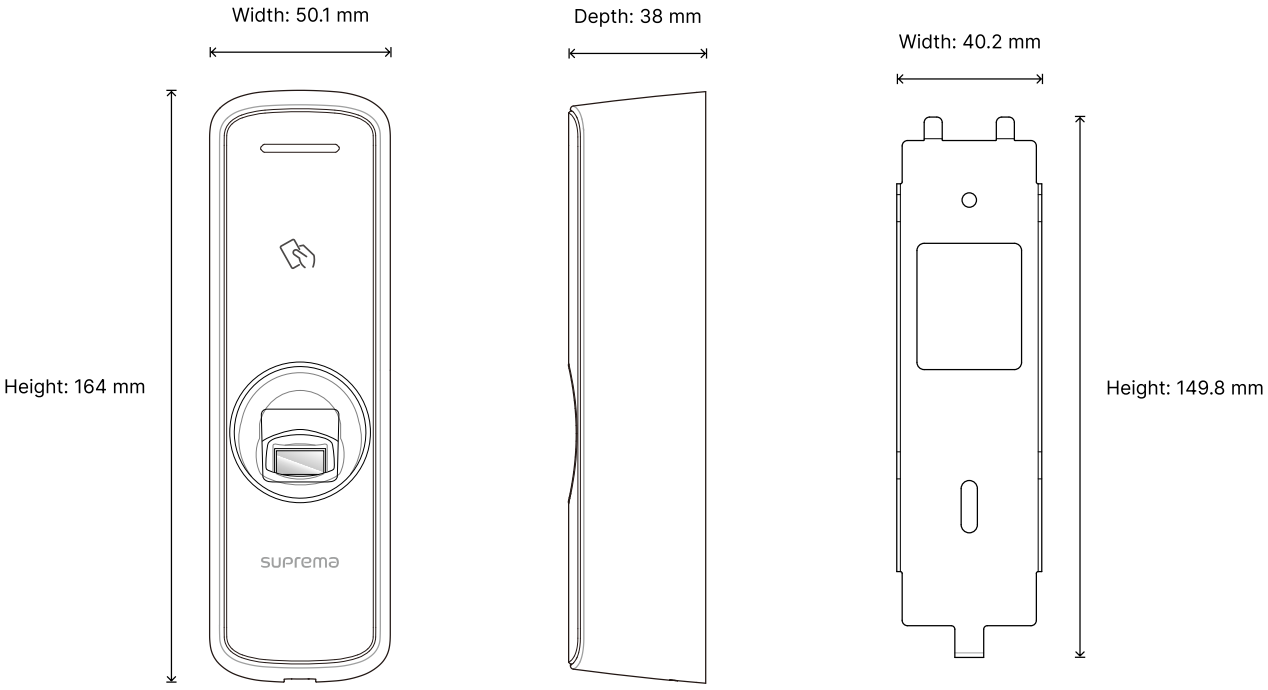
## Interface

| | |
|---|---|
| RS-485 | **1 ch Slave** |
| RS-485 Communication Protocol | **OSDP V2 compliant** |
| Tamper | **Supported** |

## Electrical

| | | |
|---|---|---|
| Power | **12 Vdc** | **Current: Max. 0.2 A** |

# 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.

**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 B 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.

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

Suprema Inc.

Address: 17F Parkview Tower, 248, Jeongjail-ro, Bundang- gu, Seongnam-si, Gyeonggi-do, 13554, Rep. of KOREA

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

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- The QT library included in this product follows the LGPL. For more information about the LGPL license, see the GNU Lesser General Public License.
- 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.**

17F Parkview Tower, 248, Jeongjail-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, 13554, Rep. of KOREA

Tel: +82 31 783 4502 | Fax: +82 31 783 4503 | Inquiry: sales_sys@supremainc.com

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