SUPREMA

bioentry Plus

IP based Fingerprint Access Control

Installation Guide
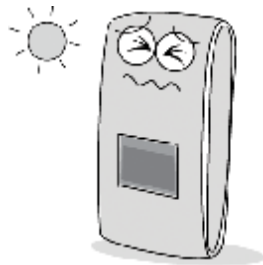**(ver 1.0)**

www.supremainc.com
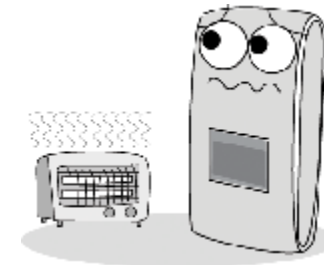
Contents

Safety precautions

n **The list below is to keep user's safety and prevent any loss. Please read carefully before use.**

Do not install the device in a place subject to direct sun light, humidity, dust or soot.

Do not place a magnet near the product. Magnetic objects such as magnet, CRT, TV, monitor or speaker may damage the device.

Do not place the device next to heating equipments.

Be careful not to let liquid like water, drinks or chemicals leak inside the device.

Clean the device often to remove dust on it.

In cleaning, do not splash water on the device but wipe it out with smooth cloth or towel.

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Safety precautions

n **The list below is to keep user's safety and prevent any loss. Please read carefully before use.**

Do not drop the device.
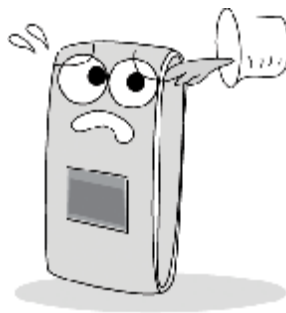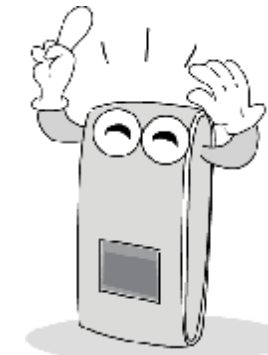
Do not damage the device.

Do not disassemble, repair or alter the device.

Do not let children touch the device without supervision.

Do not use the device for any other purpose than specified.

Contact your nearest dealer in case of a trouble or problem.

Basics of fingerprint recognition

n **What is fingerprint recognition?**

- ɪ Fingerprint is an individual's own biometric information and does not change throughout his/her life. Fingerprint recognition is a technology that verifies or identifies an individual using such fingerprint information.

- ɪ Free from the risk of theft or loss, fingerprint recognition technology is being widely used in security systems replacing PIN or cards.

n **Process of fingerprint recognition**

- ɪ Fingerprint consists of ridges and valleys. Ridge is a flow of protruding skin in a fingerprint while valley is a hollow between two ridges. Each individual has different pattern of ridges and valleys and finger recognition makes use of such originality and uniqueness of these patterns.

- ɪ Fingerprint sensor generates 2-dimentional fingerprint image using different technology. According to the sensing technology, fingerprint sensors are classified into optical, capacitive, or thermal.

- ɪ Fingerprint template is a collection of numeric data representing the features of a fingerprint. Fingerprint templates are saved inside the memory of BioStation and used for identification.

n **Secure way to protect personal information**

- ɪ To avoid privacy concern, Suprema's fingerprint products do not save fingerprint images itself. It is impossible to reconstruct a fingerprint image from a fingerprint template which is just numeric data of the features of a fingerprint.

How to place a finger

Suprema's fingerprint products show an outstanding recognition performance regardless of the user's fingerprint skin condition or the way of fingerprint positioning. However, following tips are recommended to get more optimal fingerprint recognition performance.

n **Select a finger to enroll**
- It is recommended to use an index finger or a middle finger.
- Thumb, ring or little finger is relatively more difficult to place in a correct position.
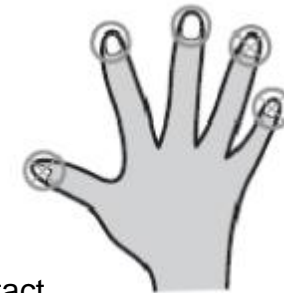
n **How to place a finger on a sensor**
- Place a finger such that it completely covers the sensor area with maximum contact.
- Place core part of a fingerprint to the center of a sensor.
  - § People tend to place upper part of a finger.
  - § The core of a fingerprint is a center where the spiral of ridges is dense.
  - § Usually core of fingerprint is the opposite side of the lower part of a nail.
  - § Place a finger such that the bottom end of a nail is located at the center of a sensor.
- If a finger is placed as in the right picture, only a small area of a finger is captured. So it is recommended to place a finger as shown in the left picture.

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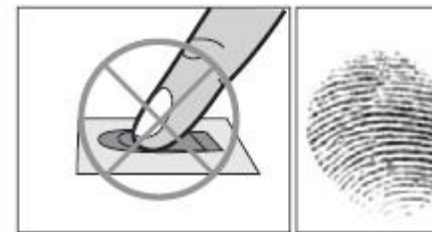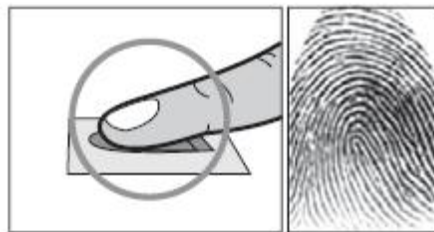
How to place a finger

n **Tips for different fingerprint conditions**

- l Suprema's fingerprint products are designed to scan fingerprint smoothly regardless of the conditions of a finger skin. However, in case a fingerprint is not read well on the sensor, please refer to the followings tips.
  - § If a finger is stained with sweat or water, scan after wiping moisture off.
  - § If a finger is covered with dust or impurities, scan after wiping them off.
  - § If a finger is way too dry, place after blowing warm breath on the finger tip.

n **Tips for fingerprint enrollment**

- l In fingerprint recognition, enrollment process is very important. When enrolling a fingerprint, please try to place a finger correctly with care.
- l In case of low acceptance ratio, the following actions are recommended.
  - § Delete the enrolled fingerprint and re-enroll the finger.
  - § Enroll the same fingerprint additionally.
  - § Try another finger if a finger is not easy to enroll due to scar or worn-out.
- l For the case when an enrolled fingerprint cannot be used due to injury or holding a baggage, it is recommended to enroll more than two fingers per user.

Product Contents

n **Basic Contents**

Wall mounting screws – 2 ea

Star-shaped screws

Star-shaped small wrench

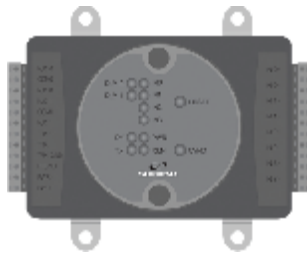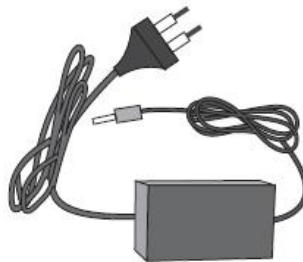Software CD

BioEntry Plus

Wall-mounting metal bracket
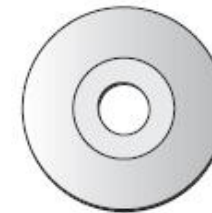
3 pin, 4 pin, 5 pin, 7 pin cables – each 1 ea
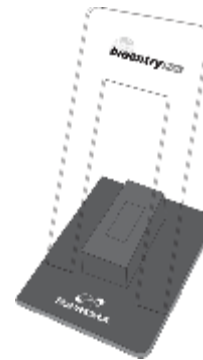
Product Contents

n **Optional accessories**

| Secure I/O | 12V power adaptor | Plastic stand | USB fingerprint scanner for enrollment on PC |

Front Side

n Front

RF card reading part
Place an RF card over the picture

LED
Display current status using seven different colors

Fingerprint sensing part
Place a finger on a sensor surface

LED Status per Color

l Green : Authorization Success

l Red : Authorization Fail

l Pink : On Processing

l Flicker Blue/Sky-Blue Color per 2sec : Normal

l Flicker Red/Pink Color per 2sec : Locked

l Flicker Blue/Red Color per 2sec : Initialized Time due to the Internal Battery Discharge

l Flicker Blue/Yellow Color per 2sec : DHCP Fail

l Flicker Red Color per 2sec : Failed. Please contact to your distributor or Suprema

l Flicker Yellow Color per 2sec : Waiting Input

l Flicker Yellow Color per 1sec : Receiving IP Address from DHCP server

Bottom and Back Side

n **Bottom**
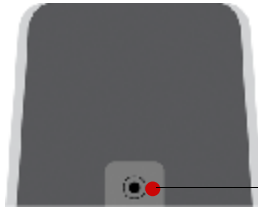
Star-shaped screw hole for fixing a body to a metal bracket

n **Back**
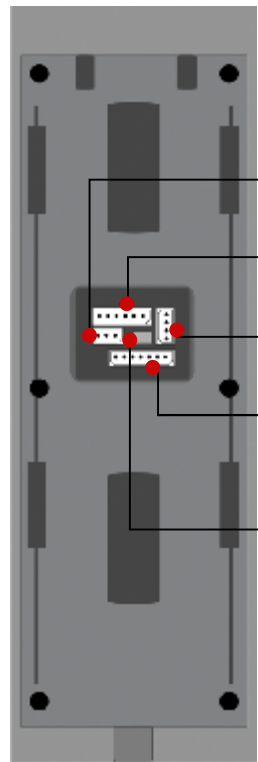
3 pin connector – wiegand output

5 pin connector – power and RS485

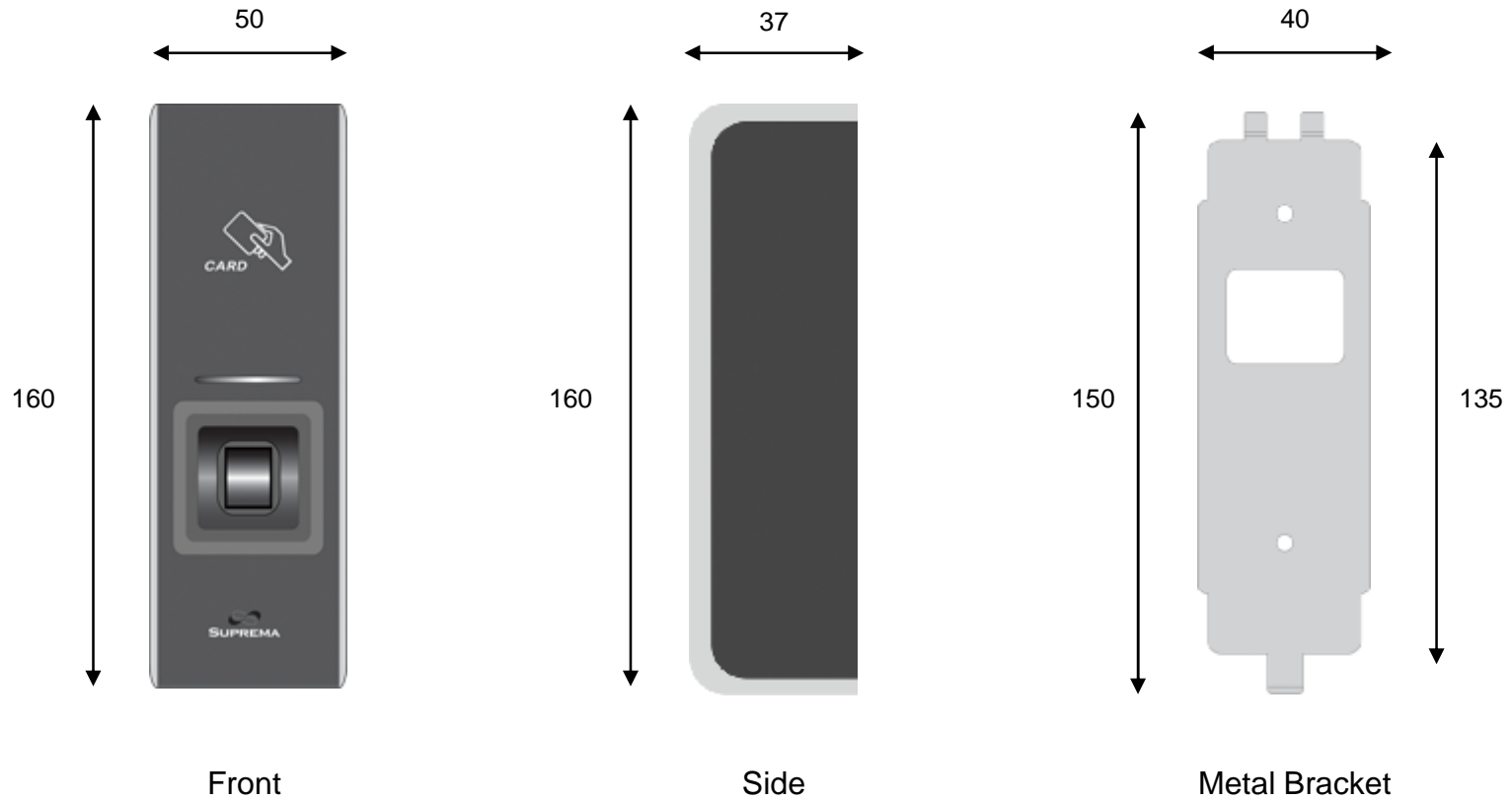4 pin connector – ethernet (TCP/IP)

7 pin connector – digital input and relay output

DIP switch – RS485 termination setting
(Refer to "RS485 Connection" pages for details)

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Product Dimension

50

37

40

160

160

150

135

Front

Side

Metal Bracket

(unit : mm)

Cables and Connectors

Power and RS485

TCP/IP

Wiegand output

Digital Inputs and Relay output
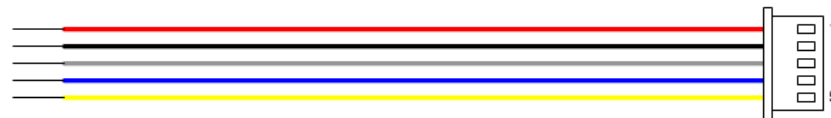
PIN	PIN DESCRIPTION	WIRE
1	POWER +12V	RED
2	POWER GND	BLACK
3	RS -485 GND	GRAY
4	RS -485 TRX+	BLUE
5	RS -485 TRX-	YELLOW

PIN	PIN DESCRIPTION	WIRE	RJ45 PIN
1	TX +	YELLOW	6
2	TX -	GREEN	3
3	RX +	RED	2
4	RX -	BLACK	1
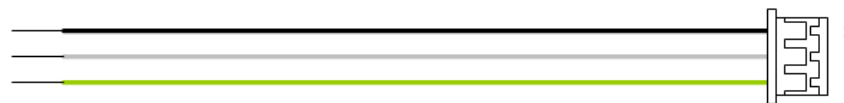
PIN	PIN DESCRIPTION	WIRE
1	WIEGAND DATA0	GREEN
2	WIEGAND DATA1	WHITE
3	WIEGAND GND	BLACK
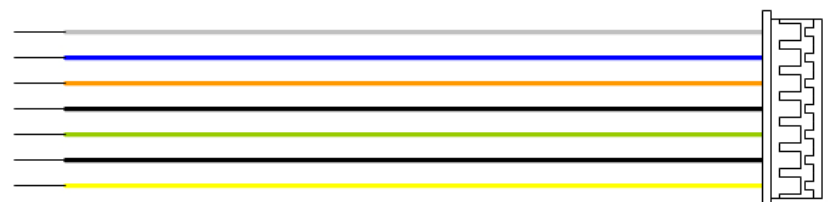
PIN	PIN DESCRIPTION	WIRE
1	SW1 INPUT	YELLOW
2	SW1 GND	BLACK
3	SW2 INPUT	GREEN
4	SW2 GND	BLACK
5	RELAY NORMAL CLOSE	ORANGE
6	RELAY COMMON	BLUE
7	RELAY NORMAL OPEN	WHITE

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Installation of Wall-mount Bracket

n **Fix wall mount bracket on a wall using wall mounting screws**

Wall mounting screws
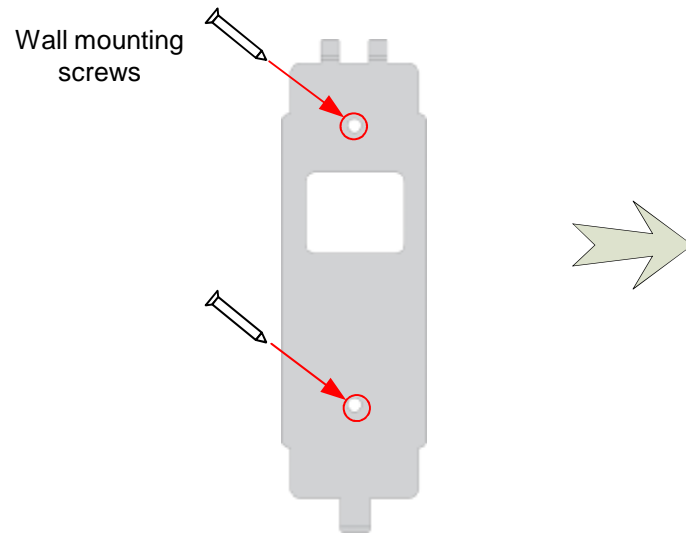
n **Hook BioEntry Plus on the wall mount bracket**

CARD

SUPREMA
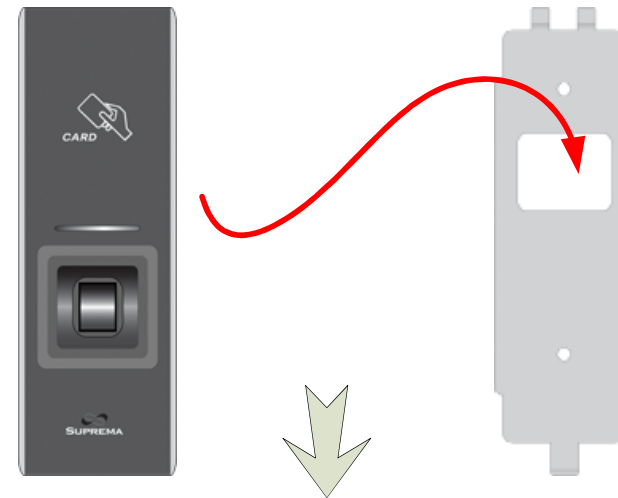
n **Fix BioStation and wall mounting bracket using a star shape screw.**

Star-shaped screw

Star-shaped wrench

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Power Connection

UPS
(optional)

DC
Power supply

RS-485

(1) Power 12V (Red)
(2) Power GND (Black)
(3) Signal GND (Gray)
(4) TRX+ (Blue)
(5) TRX- (Yellow)

BioEntry Plus
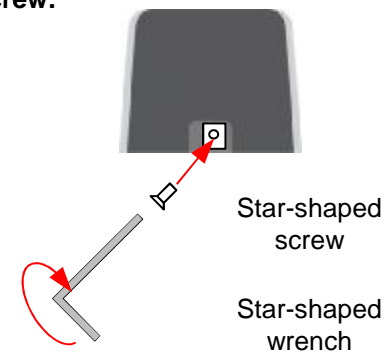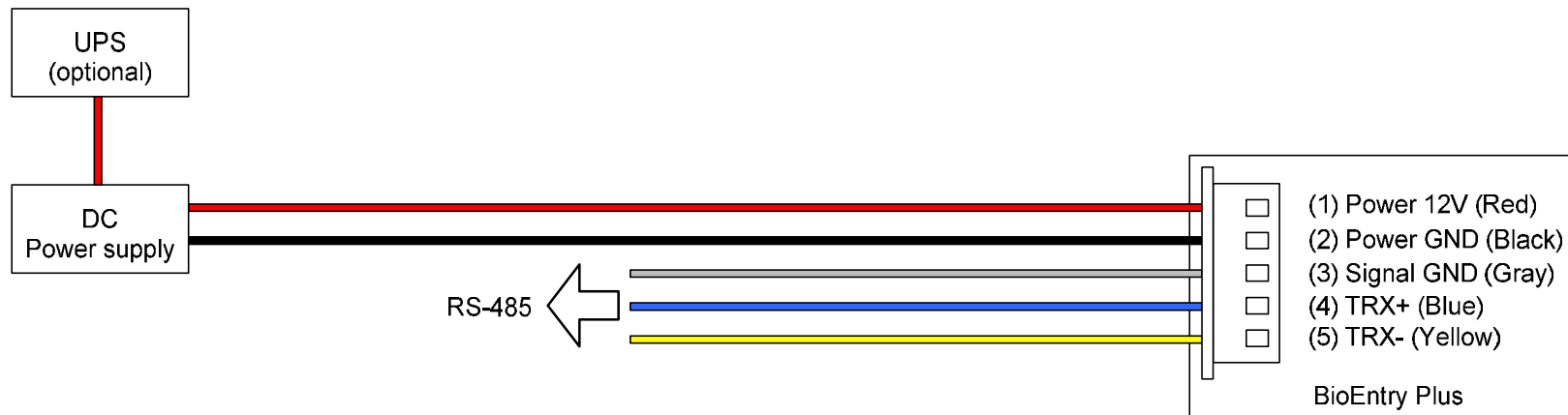
n **Recommended power supply**

I **12V ± 10%, at least 1500mA.**

I **Comply with standard IEC/EN 60950-1.**

I **To share the power with other devices, use a power supply with higher current ratings.**

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Ethernet Connection

HUB
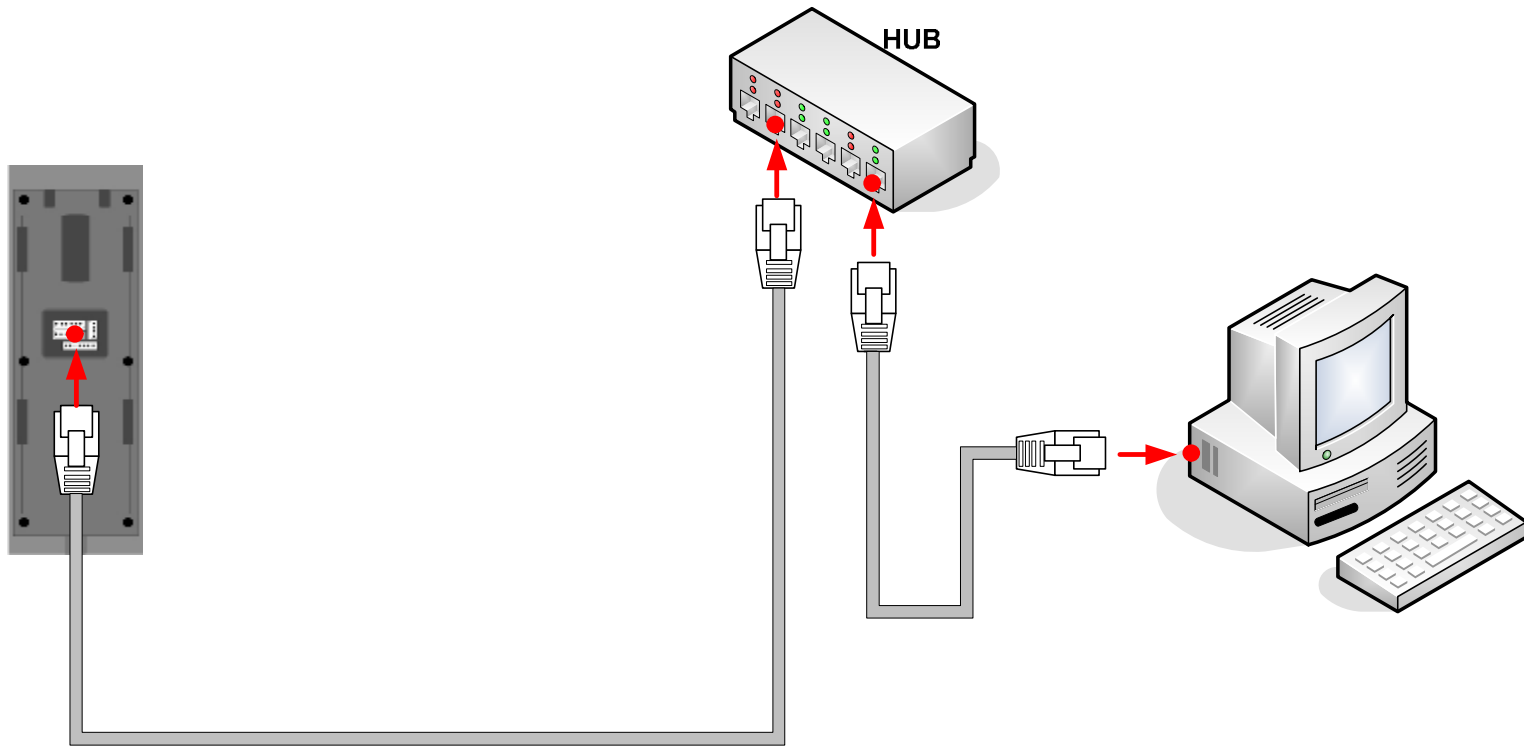
Ethernet Connection (Direct connection with PC)

n **To connect BioEntry Plus with a PC directly, connect both devices with a straight CAT-5 cable. As the BioEntry Plus supports auto MDI/MDIX feature, it is not necessary to use a crossover type cable.**
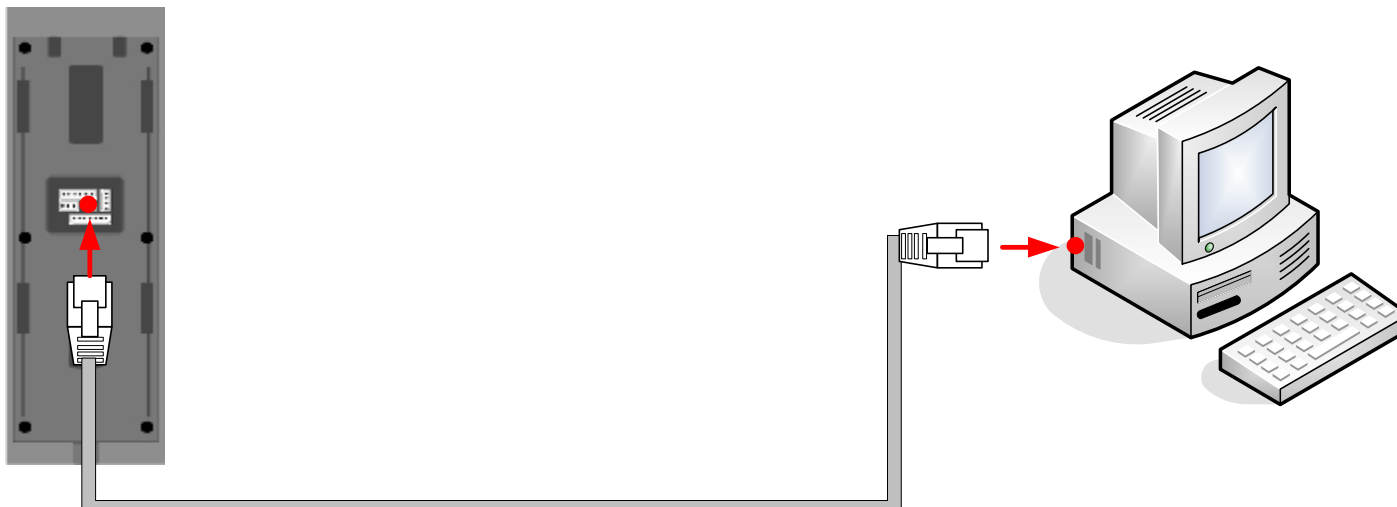
RS485 Connection for Host Communication

RS-232

PC

GND
TRX+
TRX-

RS232-485 converter

Enable termination (Note 1)

Power

(1) Power 12V (Red)
(2) Power GND (Black)
(3) Signal GND (Gray)
(4) TRX+ (Blue)
(5) TRX- (Yellow)

BioEntry Plus

Enable termination (Note1)

SW1

1 ⟶ O N
2

Power

(1) Power 12V (Red)
(2) Power GND (Black)
(3) Signal GND (Gray)
(4) TRX+ (Blue)
(5) TRX- (Yellow)

BioEntry Plus

As short as possible

Disable termination (Note 1)

SW1

1 O N
2

Important Notes
1. Only the devices at the both ends of the bus should be terminated. To enable termination on the RS232-485 converter, refer to the converter's manual.
2. Adjust the communication speed as needed. The signal quality vary depending on wiring conditions, and it may be necessary to lower the baudrates.
3. The GND signal may be omitted *if and only if* the GND potential difference is less than ±5V.

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Important Notes
1. For bus termination, only the devices at both ends of the bus should be terminated. To enable termination on the RS232-485 converter, refer to the converter's manual.
2. The stubs should be as short as practical

Max number of devices

- **Maximum numbers of devices in an RS485 loop are two(2) devices (BioStation or BioEntry Plus) and four(4) Secure I/Os**

Relay Connection – Fail safe lock

BioEntry Plus

(7) Normally Open / N.O. (White)
(6) Common (Blue)
(5) Normally Closed / N.C. (Orange)

−   +

Deadbolt /
Door strike

+   −

DC
Power supply

20
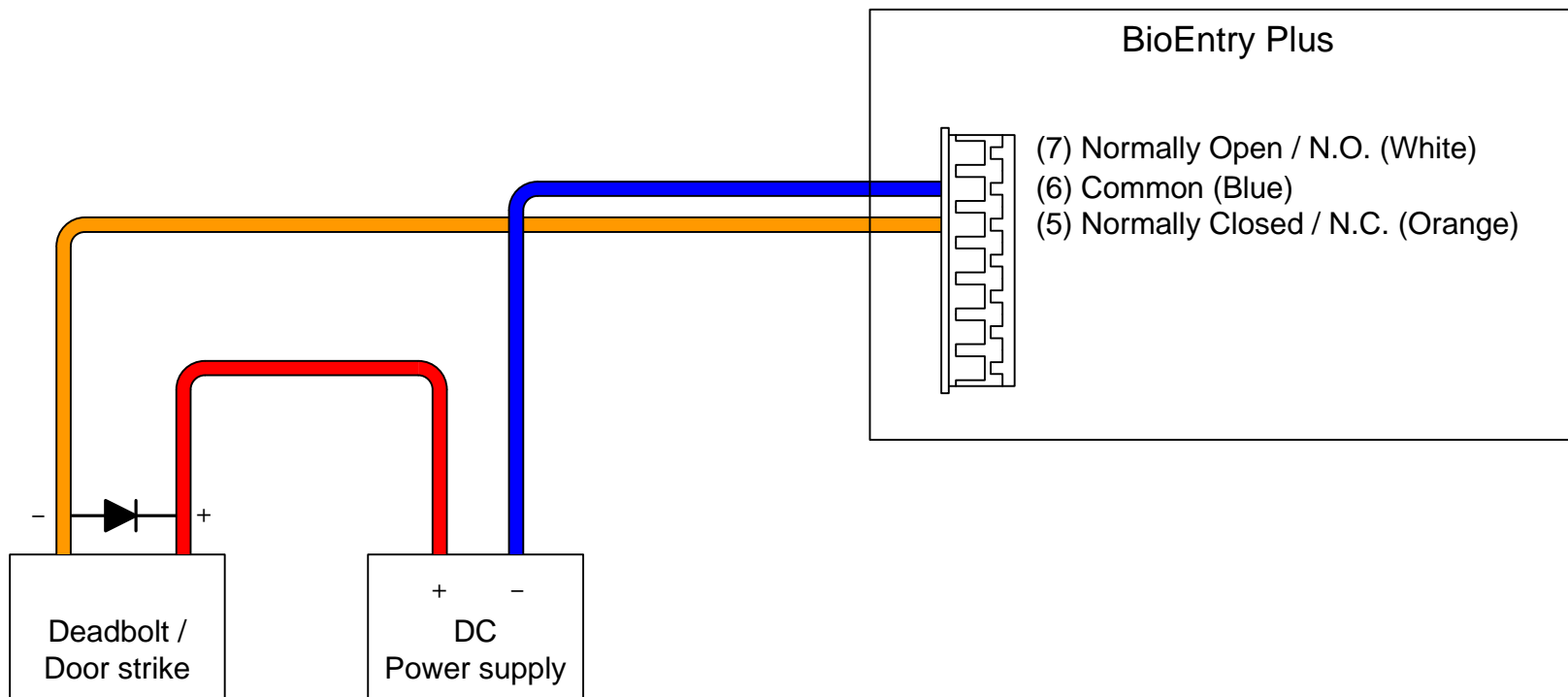
Relay Connection – Fail secure lock

BioEntry Plus

(7) Normally Open / N.O. (White)
(6) Common (Blue)
(5) Normally Closed / N.C. (Orange)

Deadbolt /
Door strike

DC
Power supply
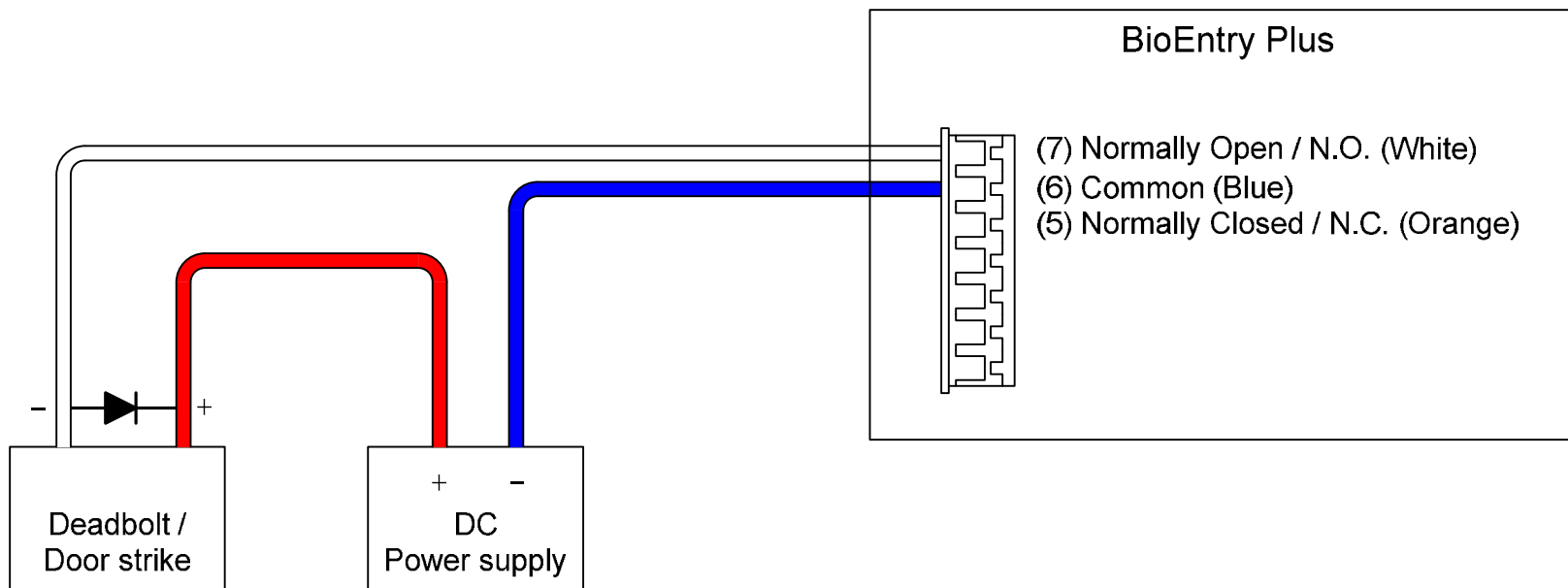
Relay Connection - Automatic door

RTE Switch

Presence Detector

BioEntry Plus

Automatic Door

Door Controller

(7) Normally Open / N.O. (White)
(6) Common (Blue)
(5) Normally Closed / N.C. (Orange)
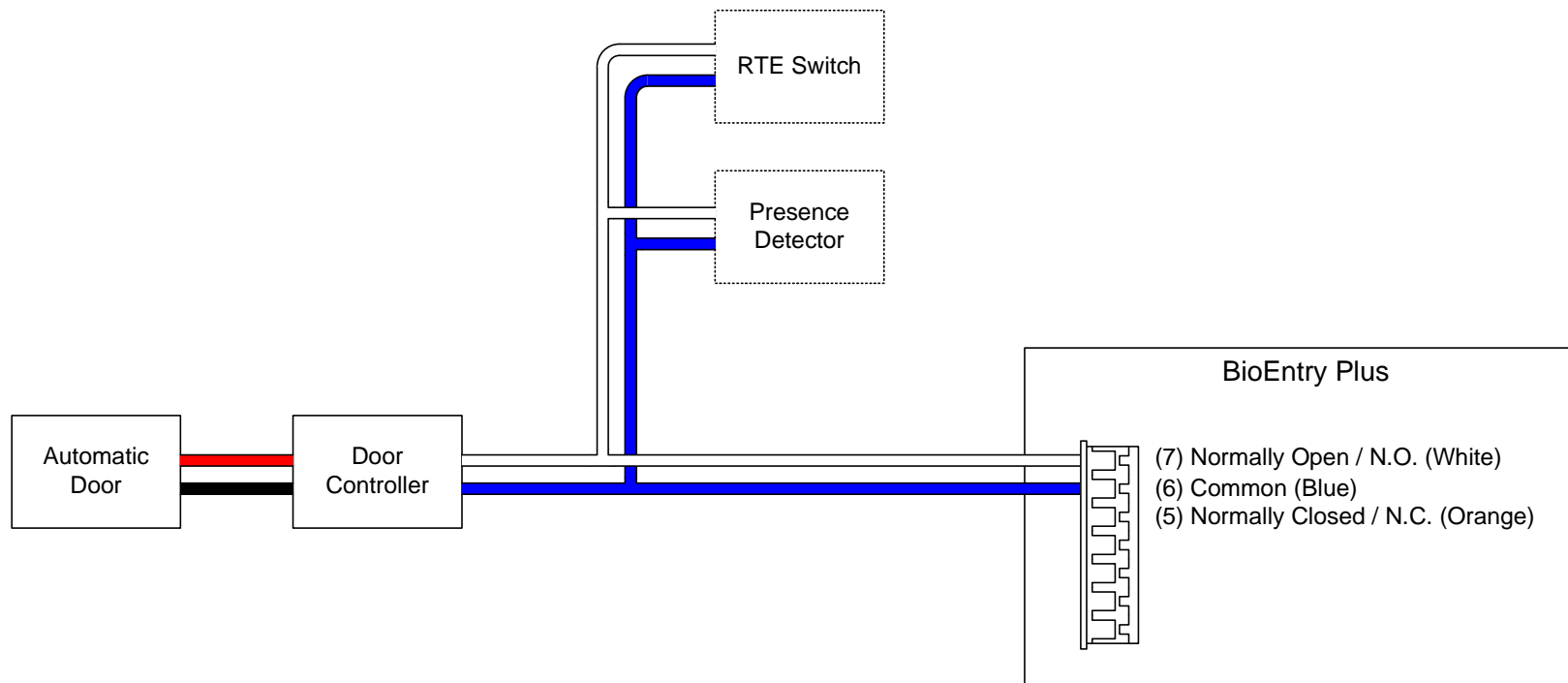
Digital Input Connection (RTE, Door sensor)

BioEntry Plus

(4) SW1 GND (Black)
(3) SW1 Input (Green)
(2) SW0 GND (Black)
(1) SW0 Input (Yellow)

Door Status

Request To Exit

BioEntry Plus

(4) SW1 GND (Black)
(3) SW1 Input (Green)
(2) SW0 GND (Black)
(1) SW0 Input (Yellow)

Switch #1

Switch #0

Wiegand Output

Controller

GND
Wiegand Input, Data 1
Wiegand Input, Data 0

BioEntry Plus

(3) Signal GND (Black)
(2) TTL OUT1/ Wiegand Out 1 (White)
(1) TTL OUT0/ Wiegand In 0 (Green)
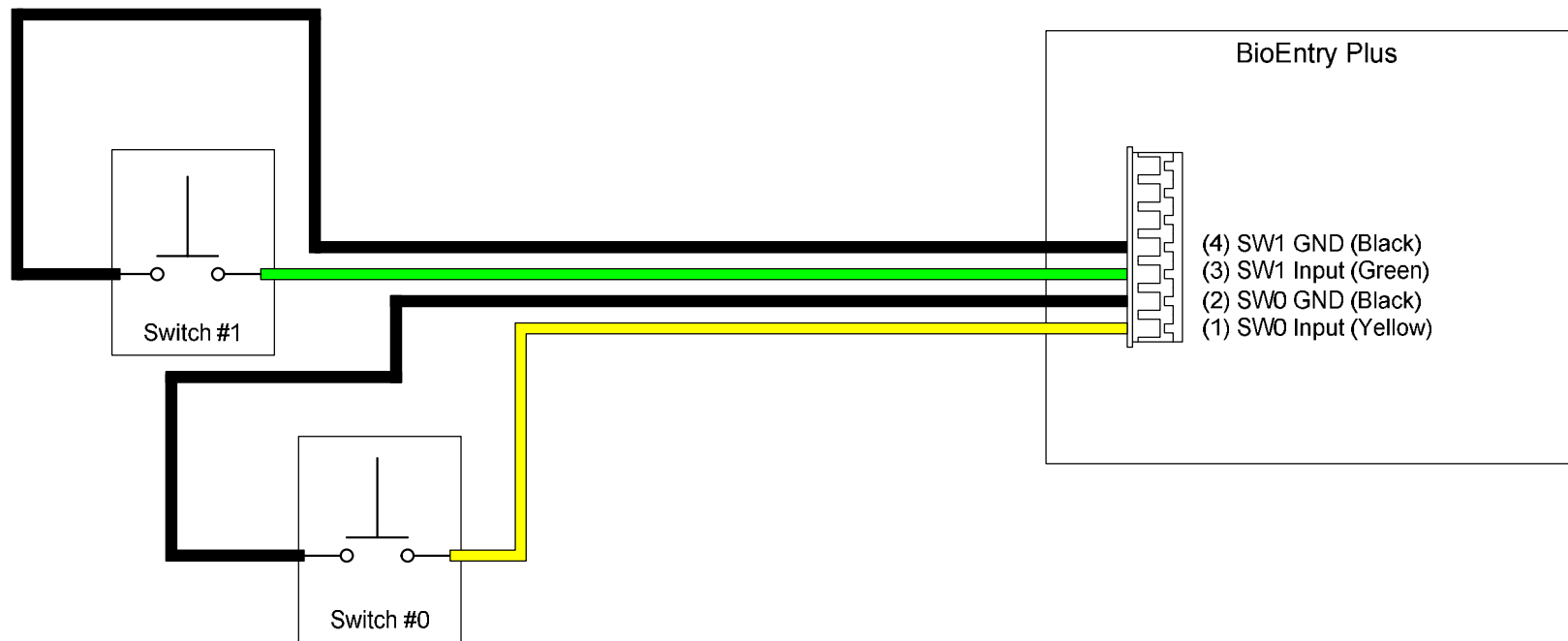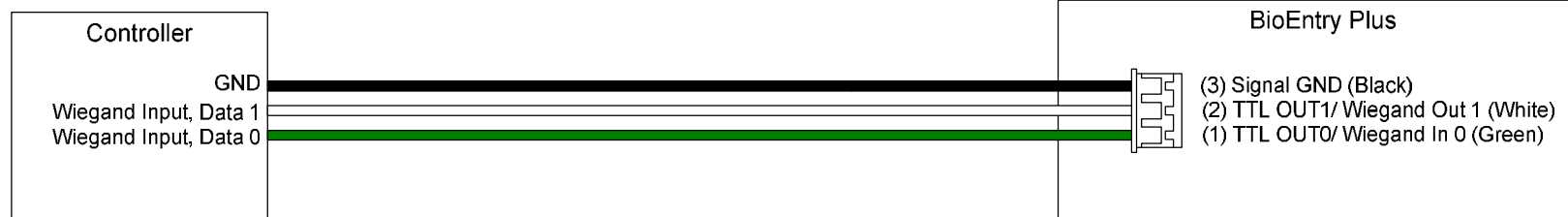
Installation Reference 1 - Stand alone

Door Sensor

Door Lock

Exit Button

BioEntry Plus

LAN

PC

Enroll Scanner
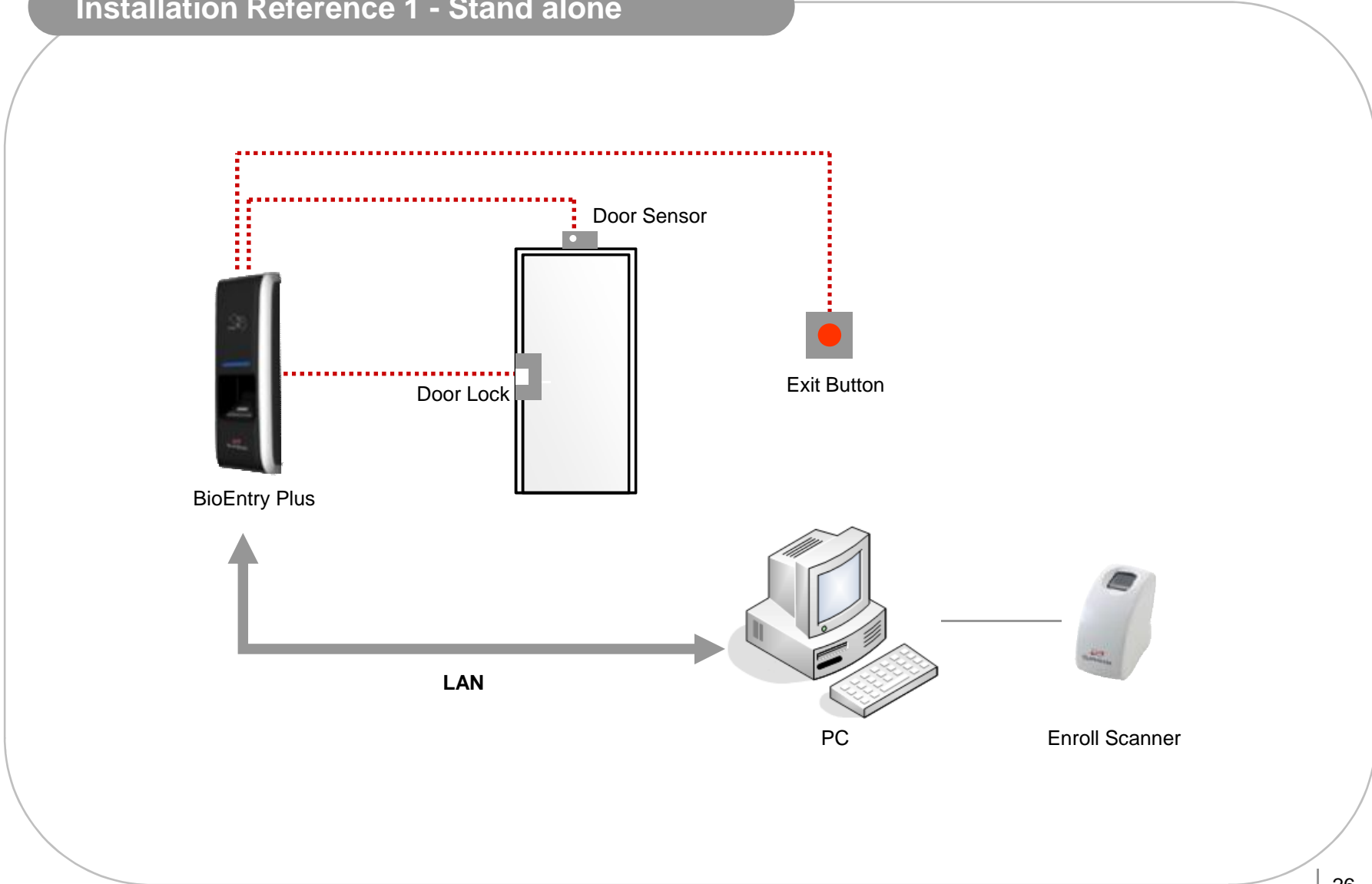
Installation Reference 2 – Secure

RS485

Door Sensor

Door Lock

Exit Button

Secure I/O

BioEntry Plus

LAN

PC

Enroll Scanner
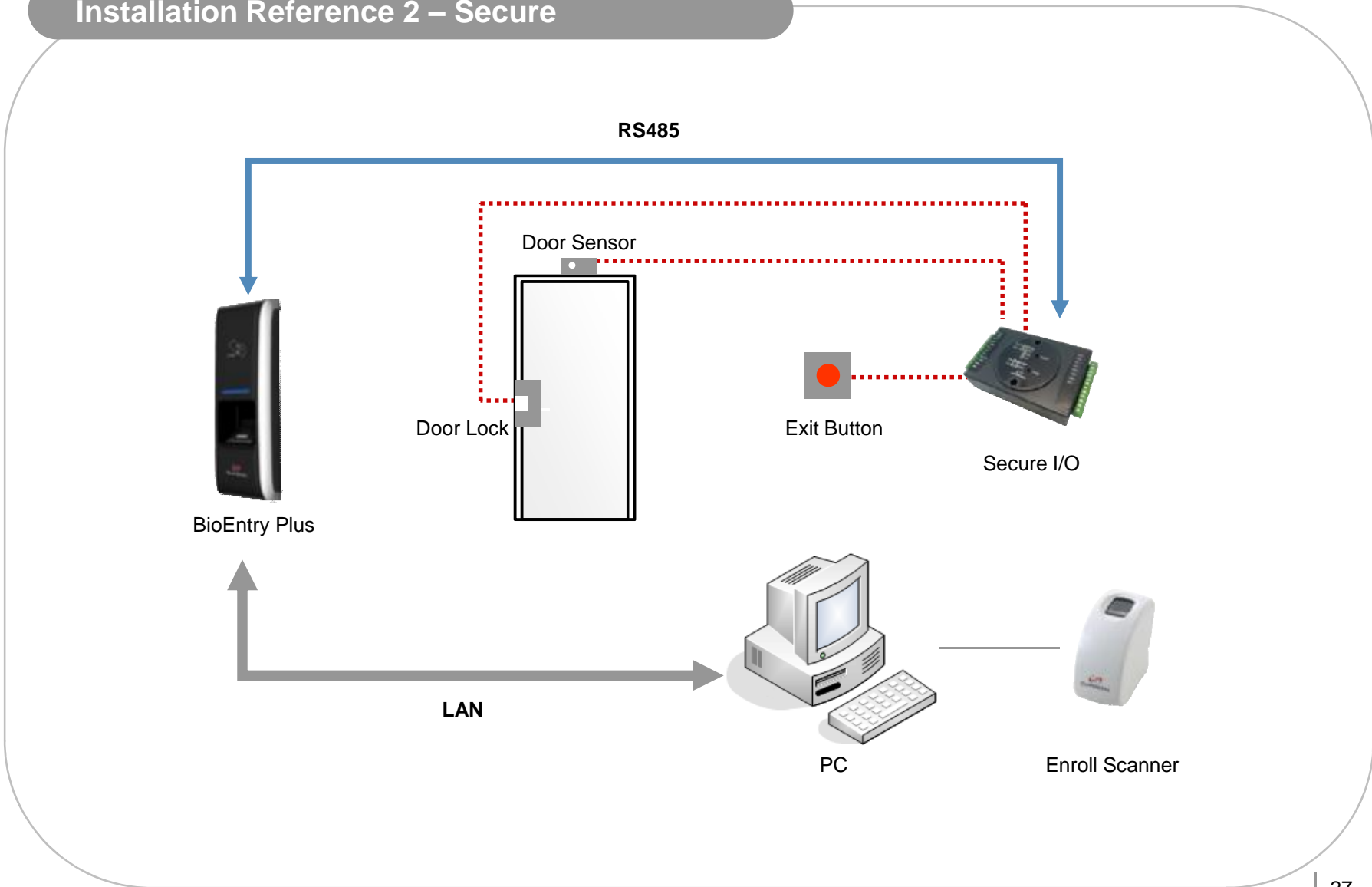
Installation Reference 3 – Network

Door Zone 1 (Anti passback)

RS485   **RS485**

BioStation   BioEntry Plus   BioEntry Plus   Secure I/O

LAN

BioStation   Secure I/O   BioEntry Plus   Exit Button

RS485

Door Zone 2 (Anti passback)

PC Server   Enroll Scanner

PC Client

PC Client

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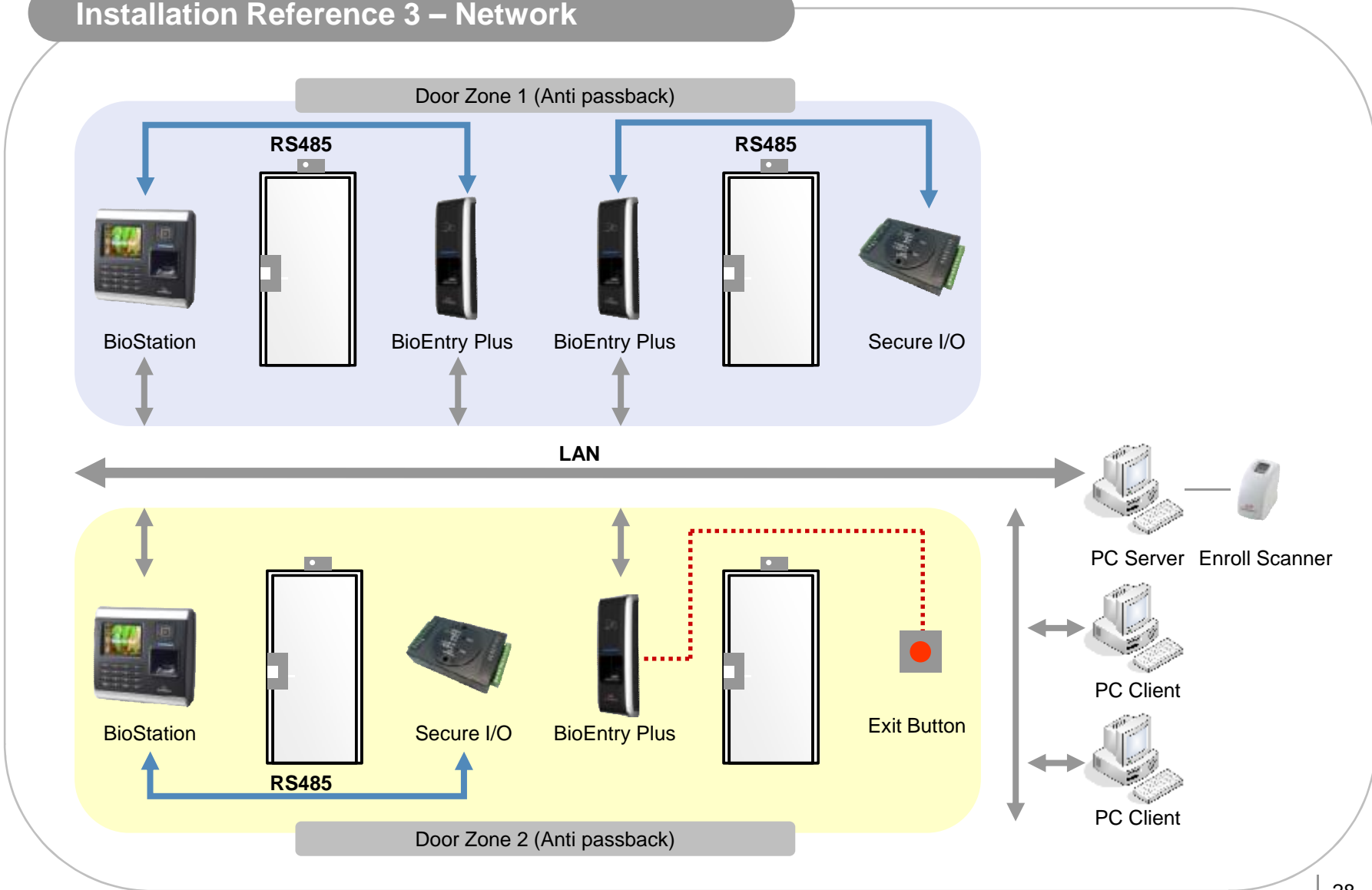
Electrical Specification

	Min.	Typ.	Max.	Notes
Power				
Voltage (V)	10.8	12	13.2	Use regulated DC power adaptor only
Current (mA)	-		250	
Switch Input				
V_{IH} (V)	-	TBD	-	
V_{IL} (V)	-	TBD		
Pull-up resistance (Ω)	-	4.7k	-	The input ports are pulled up with 4.7k resistors
TTL/Wiegand Output				
V_{OH} (V)	-	5	-	
V_{OL} (V)	-	0.8	-	
Pull-up resistance (Ω)	-	4.7k	-	The outputs ports are open drain type, pulled up with 4.7k resistors internally
Relay				
Switching capacity (A)	-	-	1 0.3	30V DC 125V AC
Switching power (resistive)	-	-	30W 37.5VA	DC AC
Switching voltage (V)	-	-	110 125	DC AC

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General Specification

Item	Specification
CPU	400MHz DSP
Fingerprint Sensor	OC Model : Optical Sensor TC Model : Capacitive Sensor
IN/OUT	Relay Out x 1, Switch Input x 2, Wiegand In/Out x 1 RS-485 x 1, Ethernet x 1
Power Input Rate	DC12V, Max 250mA

Support Cards	BioEntey Plus OC/TC Model (BEPL-OC/TC) :
	  - 125KHz EM4100 Compatible Card Read
	BioEntry Plus HID OC/TC Model (BEPH-OC/TC)
	  - 125KHz HID Prox Compatible Card Read
	BioEntry Plus Mifare OC/TC Model (BEPM-OC/TC)
	  - 13.56MHz Mifare Card Read/Write
	  - 13.56MHz ISO14443A Card CSN Read
	BioEntry Plus iClass OC Model
	  - 13.56Mhz iClass Card Read/Write

Size	50 x 160 x 38 (Width x Height x Depth)
Certified	KCC, CE, FCC

Troubleshooting

n **Fingerprint can not be read well or it takes too long.**

- Check whether a finger or fingerprint sensor is stained with sweat, water, or dust
- Retry after wiping off finger and fingerprint sensor with dry towel.
- If a fingerprint is way too dry, blow on the finger and retry.

n **Fingerprint is entered but authorization keeps failing.**

- Check whether the user is restricted by door zone or time zone.
- Inquire of administrator whether the enrolled fingerprint has been deleted frin the device for some reason.

n **Authorized but door is not opened.**

- Check whether the time is set as lock time.
- Check whether an antipass back mode is in use. In antipass back mode, only who entered can exit.

n **Device doesn't operate though power is connected.**

- Check whether a device and a bracket is well connected to each other. If not, a tamper switch is activated and the device doesn't work.

Device cleaning

- Wipe out machine surface with dry towel or cloth.
- In case there is dust or impurities on the sensor of the BioStation, wipe off the surface with dry towel.
- Note that if the sensor is cleaned by detergent, benzene or thinner, surface is damaged and fingerprint can't be entered.

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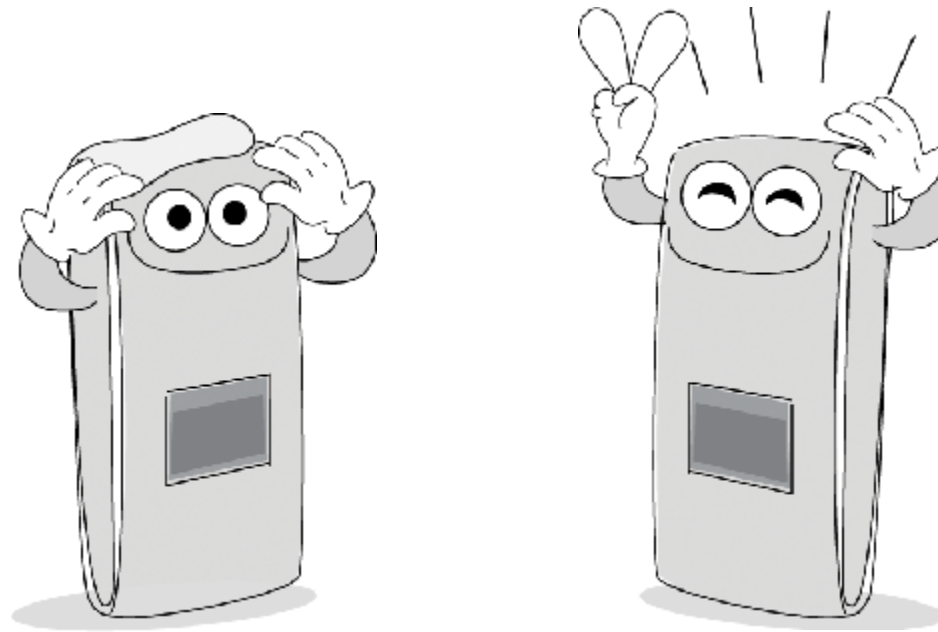
FCC Rules

Caution

- Changes or modifications not expressly approved by the manufacturer responsible for compliance could void the user's authority to operate the equipment.

Warning

- 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.

Information to User

- This equipment has been tested and found to comply with the limit of a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, user and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guaranteee that interference will not occur in a particular installation; if this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

  1. Reorient / Relocate the receiving antenna.
  2. Increase the separation between the equipment and receiver.
  3. Connect the equipment into an outlet on a circuit difference from that to which the receiver is connected.
  4. Consult the dealer or an experienced radio/TV technician for help

Caution

- **RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.**
- **DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.**