Input Module
INSTALLATION GUIDE

suprema
SECURITY & BIOMETRICS

CONTENTS

Safety information

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.

ℹ️ **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 the 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 adapters, 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.

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

- If the right power supply is not used, the product may malfunction.
- Refer to the Power in the product specifications for maximum current consumption specifications.

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 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 the product at temperatures from -20°C to 60°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 the 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.

Do not use the product for anything other than its intended use.
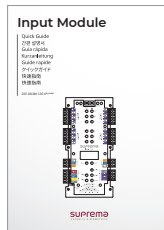
- The product may malfunction.

Introduction

Components
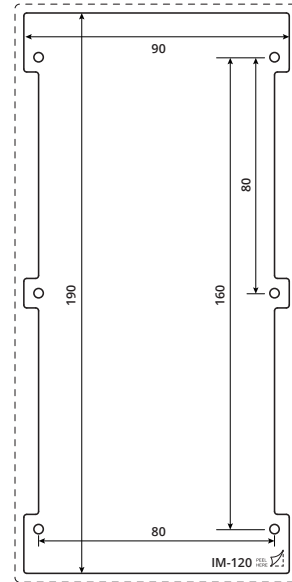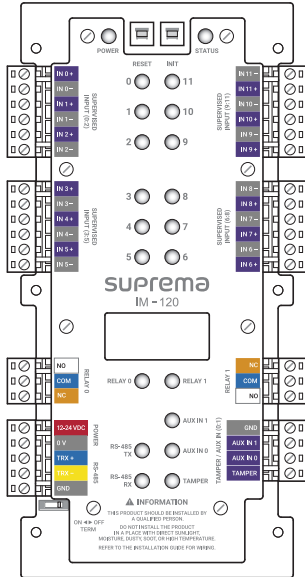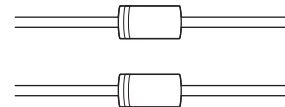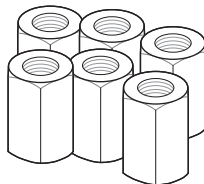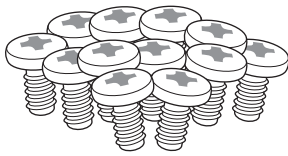

Input Module (IM-120)	Drilling Template

Quick Guide	Open Source Software Guide

| Fixing Screw x12	Spacer x6	Diode x2

Components may vary according to the installation environment.

Accessory

You can use the Input Module with the enclosure (ENCR-10). The enclosure is sold separately, and you can install two Input Modules in one enclosure. The enclosure includes a power status LED board, power distribution board, power supply, and tamper. To learn how to install the Input Module in the enclosure, refer to Using the Input Module with the enclosure.
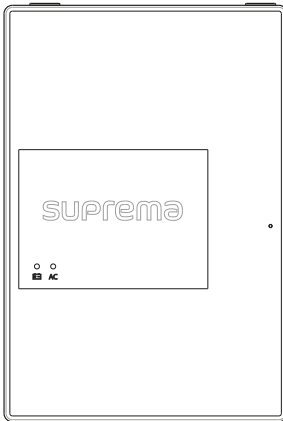
ENCR-10

- There is no optimal height for installing ENCR-10 on the wall. Install it to a safe and convenient location for you to use.

- Fixing screws for the enclosure, the device, and the power supply cable are included in the ENCR-10 package. Use each screw correctly by following the details below.
  - Fixing screws for the enclosure (diameter: 4 mm, length: 25 mm) x 4
  - Fixing screws for the device (diameter: 3 mm, length: 5 mm) x 6
  - Fixing screws for the power supply cable (diameter: 3 mm, length: 8 mm) x 1

Name and function of each part
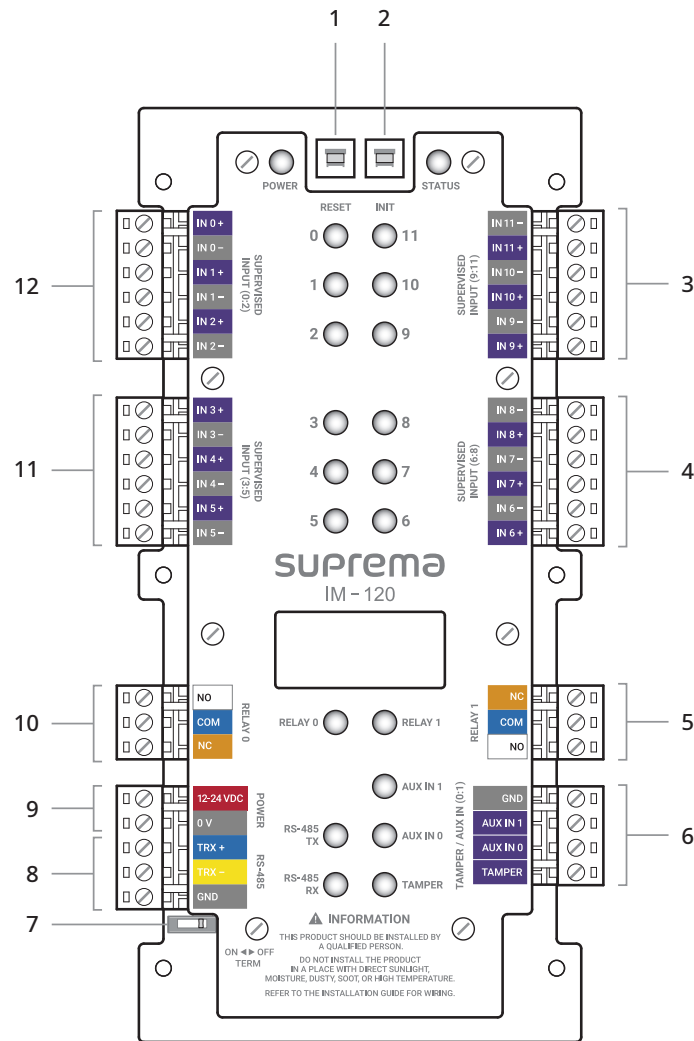
No.	Name
1	RESET button
2	INIT button
3	Supervised Input (9, 10, 11) connection
4	Supervised Input (6, 7, 8) connection
5	Relay 1 connection
6	AUX IN (0, 1) and Tamper connection
7	RS-485 terminating resistance switch
8	RS-485 connection
9	Power connection (DC 12 - 24 V)
10	Relay 0 connection
11	Supervised Input (3, 4, 5) connection
12	Supervised Input (0, 1, 2) connection

- Press and hold the INIT button for 2 seconds or longer to initialize the Input Module currently linked with a device and connect it to a different device.

LED Indicator

You can check the status of the device by the color of the LED indicator.

Item	LED	Status
POWER	Solid red	Power on
STATUS	Solid green	Connected with the secure session
	Solid blue	Disconnected from a master device
	Solid pink	Upgrading the firmware
	Solid yellow	RS-485 communication error due to different encryption key or OSDP packet loss
	Solid sky blue	Connected without the secure session
	Blinking green	Waiting for the final input to reset settings
	Solid green	Settings initialization completed
SUPERVISED INPUT (0 - 11)	Solid red	Receiving an input signal
RELAY (0, 1)	Solid red	Relay operation
RS-485 TX	Blinking orange	Transmitting RS-485 data
RS-485 RX	Blinking green	Receiving RS-485 data
AUX IN (0, 1)	Solid orange	Receiving an AUX signal
TAMPER	Solid orange	Tamper operation

Installation example

The Input Module provides instant relay behavior by connecting to BioStar 2 for detected inputs in real-time and it operates a relay or saves logs for detected inputs while it is disconnected from the master device. The Input Module supports 12 channel supervised input, 2 channel relay, 2 channel AUX input, and 1 channel tamper input to detect status, such as 1 channel RS-485, disconnection, short, on, or off for networking with the master device.
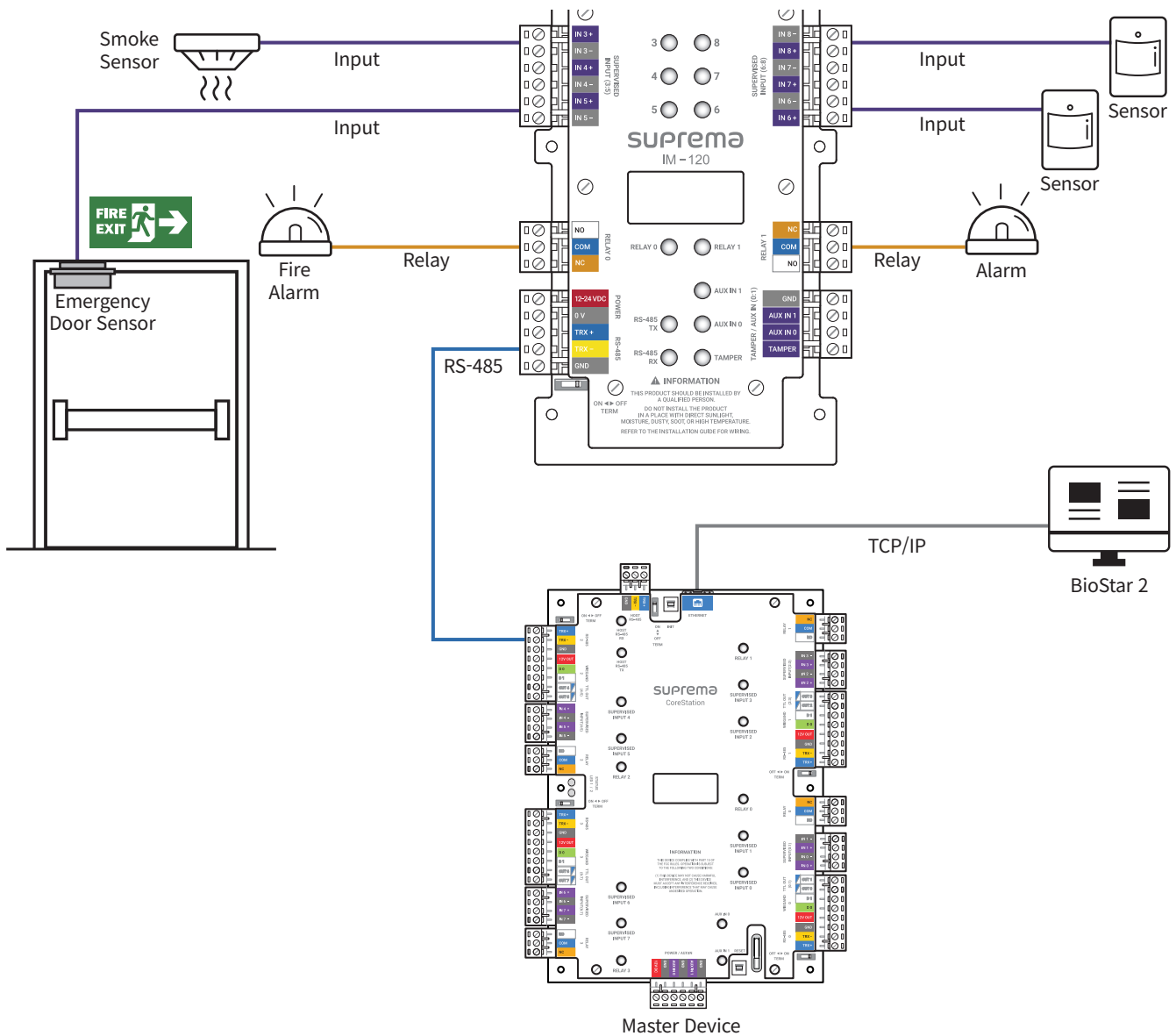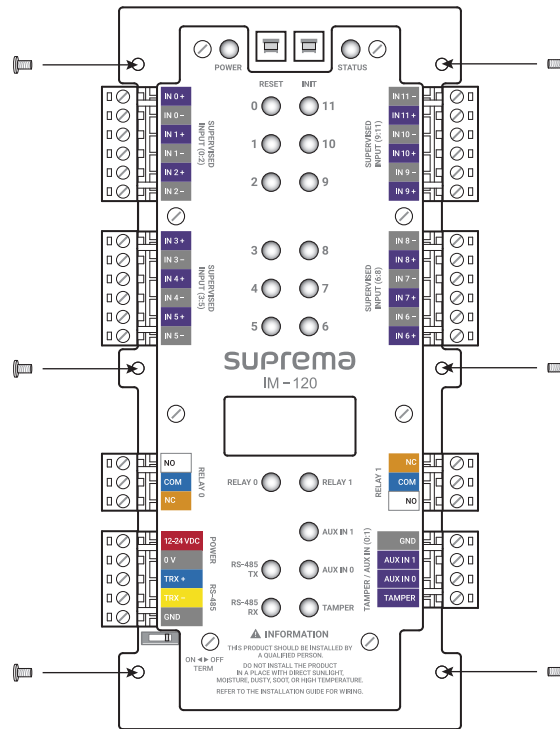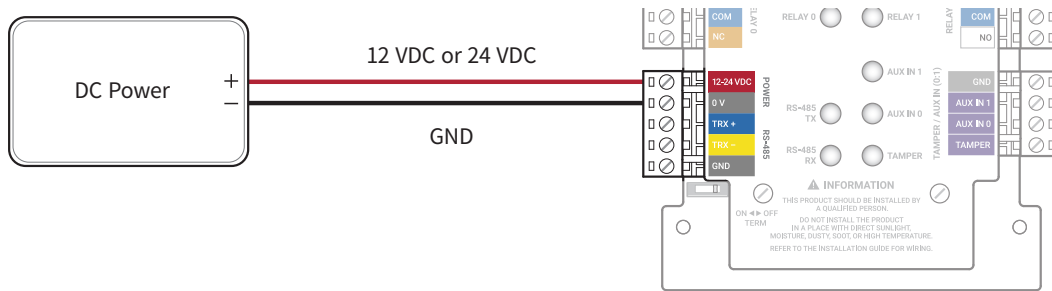
Installation

> ⓘ • To learn how to install the Input Module in the enclosure, refer to Using the Input Module with the enclosure.

1 Fix a spacer on the position to mount Input Module using a fixing screw.

2 Fix the product on top of the fixed spacer firmly using a fixing screw.

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Power Connection

- Make sure to use separate power for the access control device and Input Module.
- 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.
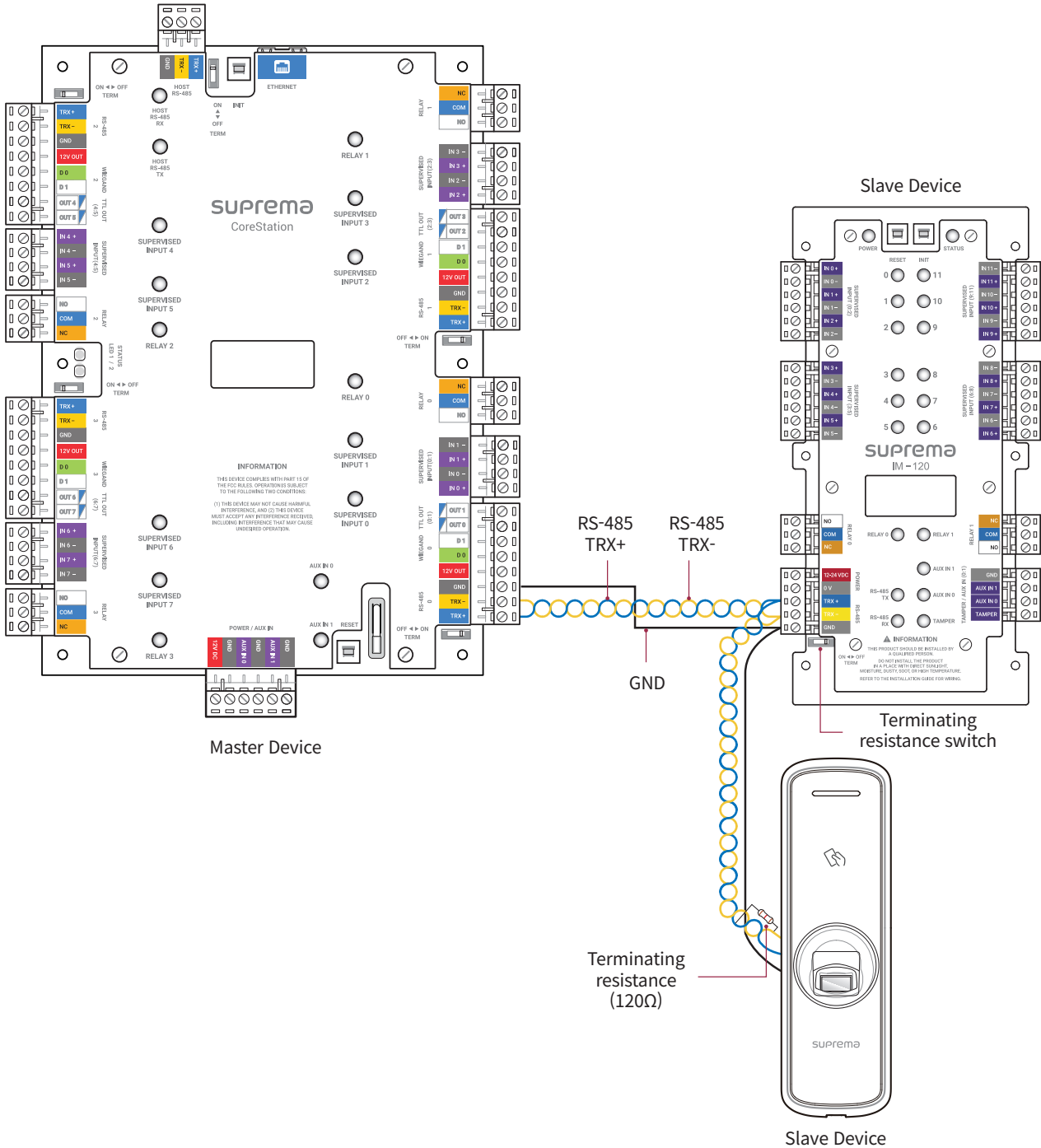- DO NOT extend the length of power cable when using the power adapter.

- It is recommended to connect and use an Uninterruptible Power Supply (UPS) to prevent power failure.

RS-485 Connection

You can connect the Input Module to a master device.

> • 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. Set the termination switch(TERM) to ON for Input Module.

Master Device

Slave Device

RS-485 TRX+

RS-485 TRX-

GND

Terminating resistance switch

Terminating resistance (120Ω)

Slave Device

> • RS485 wire size shall be over 26 AWG and all wiring must comply with National Electrical Code, ANSI/NFPA 70.

Relay Connection

The relay of the Input Module can control door locks and alarms. Connect the relay as NC (Normally Closed) or NO (Normally Open) by referring to the installation guide of the connection device.
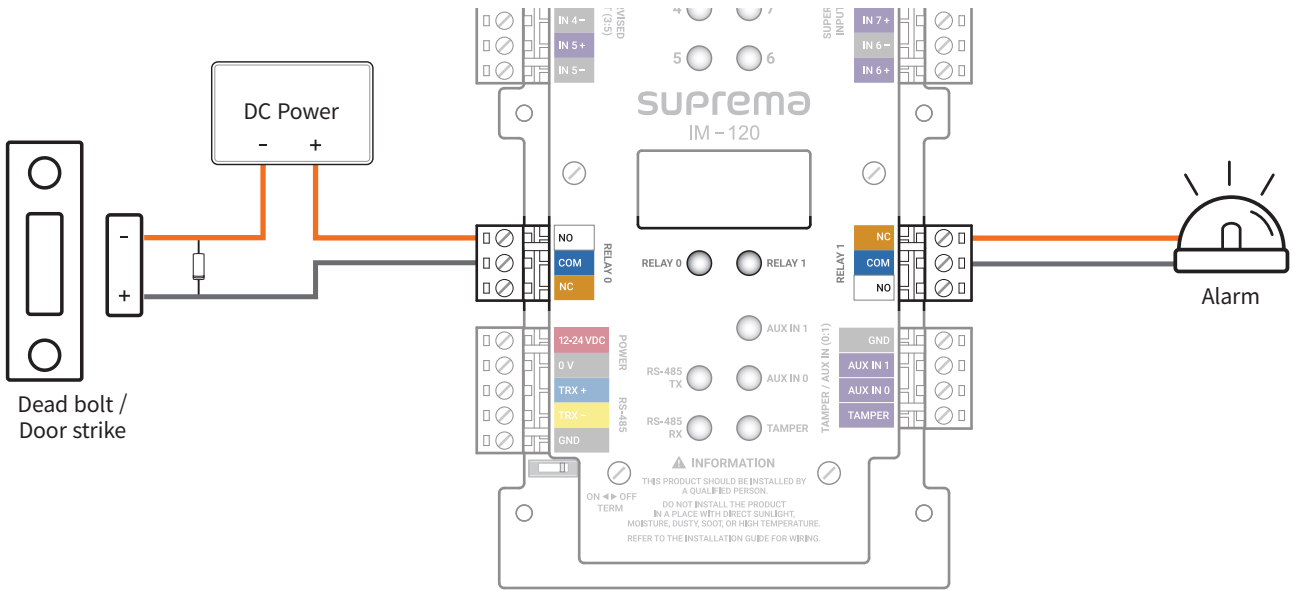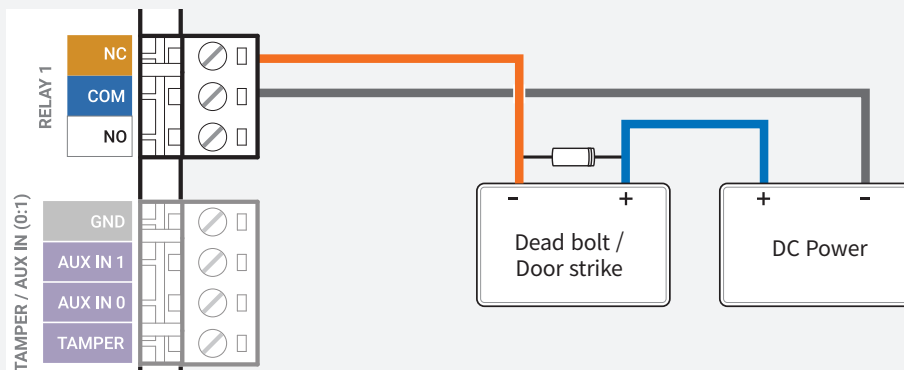

- **Fail Safe Lock**: In order to use the Fail Safe Lock, connect the NC relay as shown in the figure below. There is normally a current flowing through the relay for the Fail Safe Lock. When the relay is activated, blocking the current flow, the door will open. If the power supply to the product is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


- **Fail Secure Lock**: In order to use the Fail Secure Lock, connect NO 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.
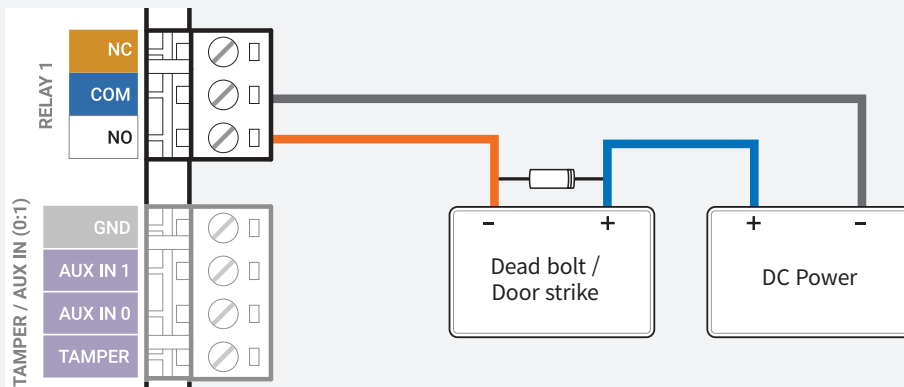
- Connect a diode to both ends of the power input as shown in the figure below when installing a deadbolt or a door strike. Make sure to connect the Cathode (direction to the stripe) to the + part of the power while paying attention to the direction of the diode.

- Do not connect the relay of the Input Module in duplicate to the device connected to the relay port of the master device.

Supervised Input Connection

You can connect a fire sensor, heat sensor, security sensor, door sensor, exit button, or etc. The SUPERVISED INPUT 0 to 11 pins detect the voltage flowing through the circuit to monitor device disconnection, short, on, and off conditions, and can also be used as a general TTL input. With BioStar 2, you can set the behavior according to the Supervised Input status, and you can monitor the status of each input.
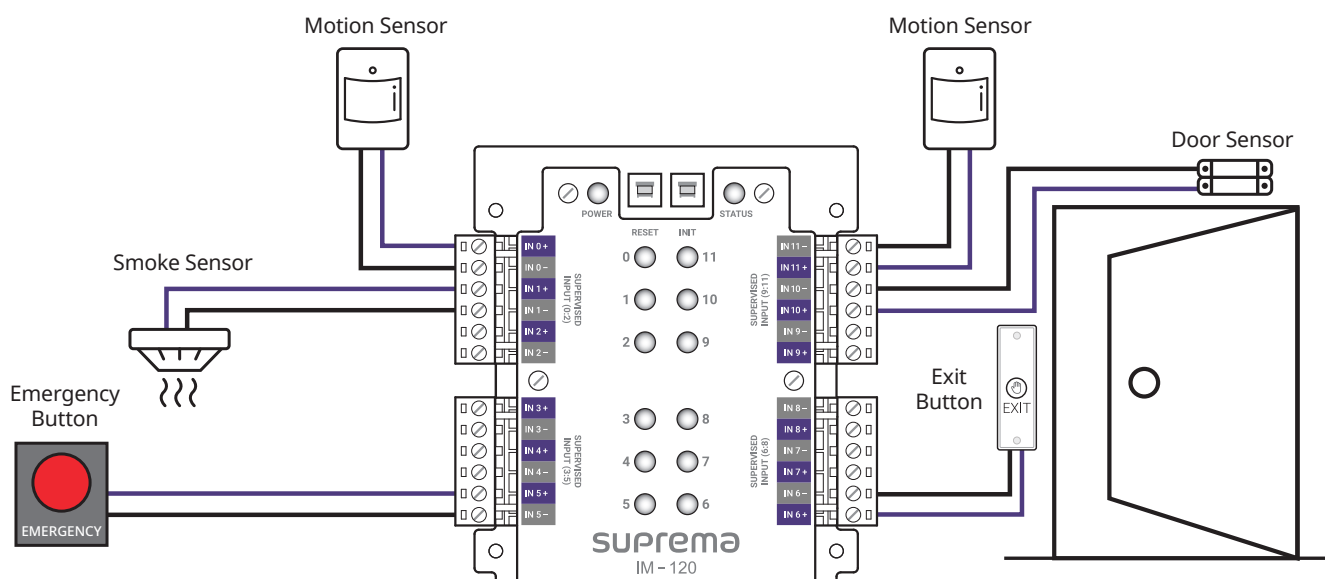
- Do not connect the input of the Input Module in duplicate to the device connected to the input port of the master device.

- The Input Module can be used by connecting 1 kΩ, 2.2 kΩ, 4.7 kΩ, or 10 kΩ resistors. After connecting the resistor corresponding to the input device of the connection, set the same resistance value in BioStar 2.

- To learn how to operate it depending on the supervised input status, refer to the manual of BioStar 2.

Tamper Connection

If Input Module is detached from the installed location due to an external factor, it can trigger an alarm or save an event log.

Tamper
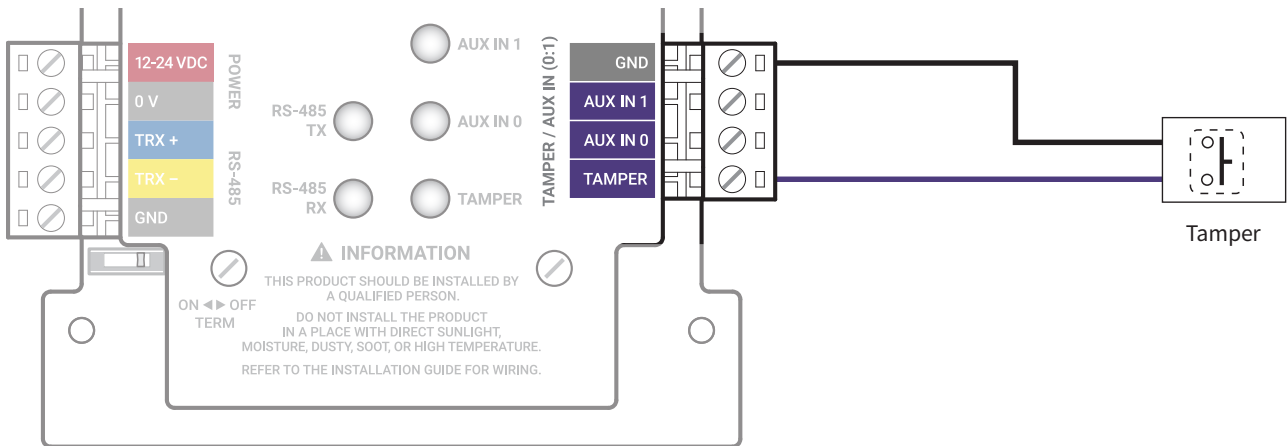
Using the Input Module with the enclosure

The Input Module can be installed inside the enclosure (ENCR-10) for physical and electrical protection. The enclosure includes a power status LED board, power distribution board, power supply, and tamper. The enclosure is sold separately.

Securing the battery

Insert the battery velcro strap into the enclosure and secure the battery.
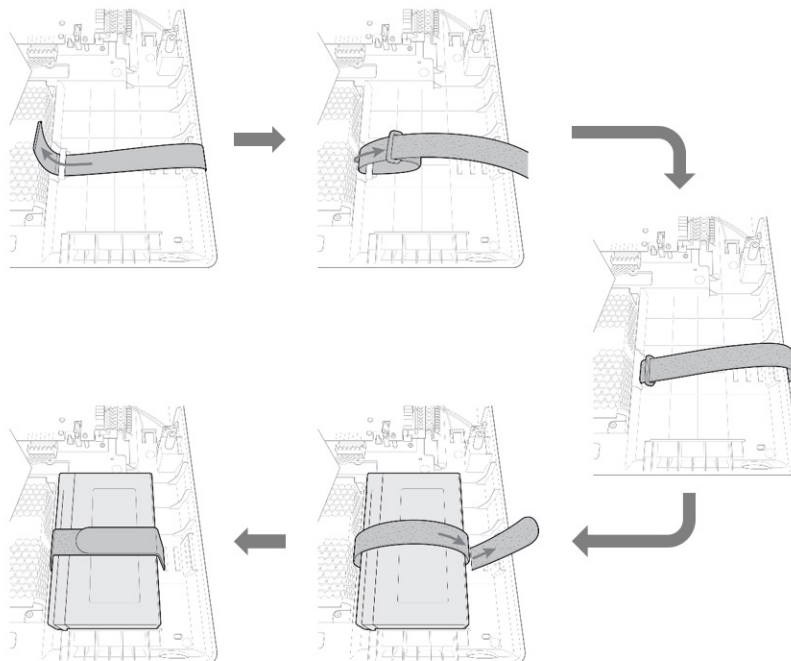
> ⚠ • Use a backup battery with 12 VDC and 7 Ah or higher. This product was tested with 'ES7-12' battery of 'ROCKET'. It is recommended to use a battery corresponding to 'ES7-12'.

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- The battery is sold separately.

- If the dimension of the backup battery is larger than the recommended specification, it may not be able to be mounted in the enclosure or the enclosure may not close after it is mounted. Also, if the shape and dimension of the terminals are different, the battery cannot be connected using the cable provided.

Terminal

(Unit: mm)

Backup Battery
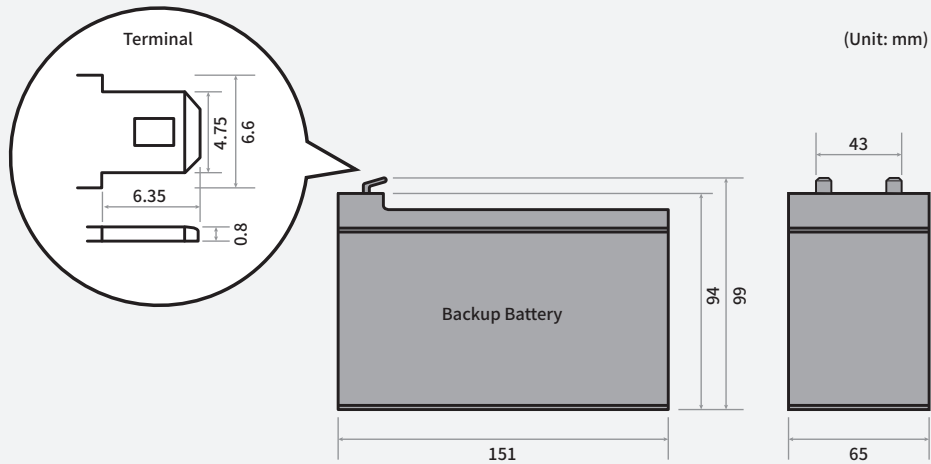
Installing the Input Module in the enclosure

1 Check the position to install the Input Module in the enclosure. You can install two Input Modules in one enclosure.
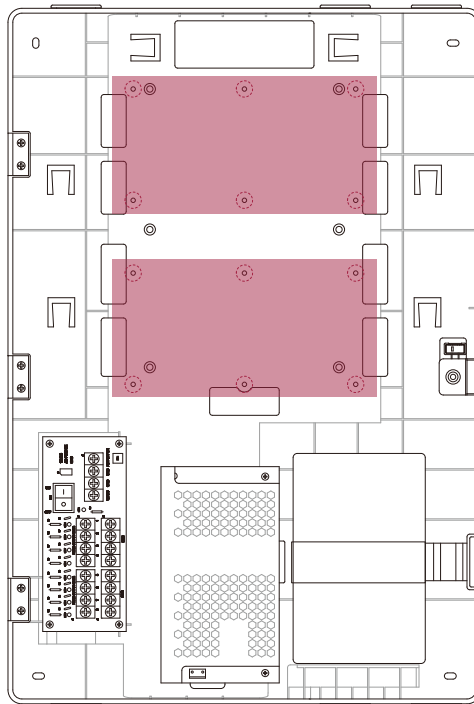
2 After positioning the Input Module in the enclosure, fix it with the fixing screws.
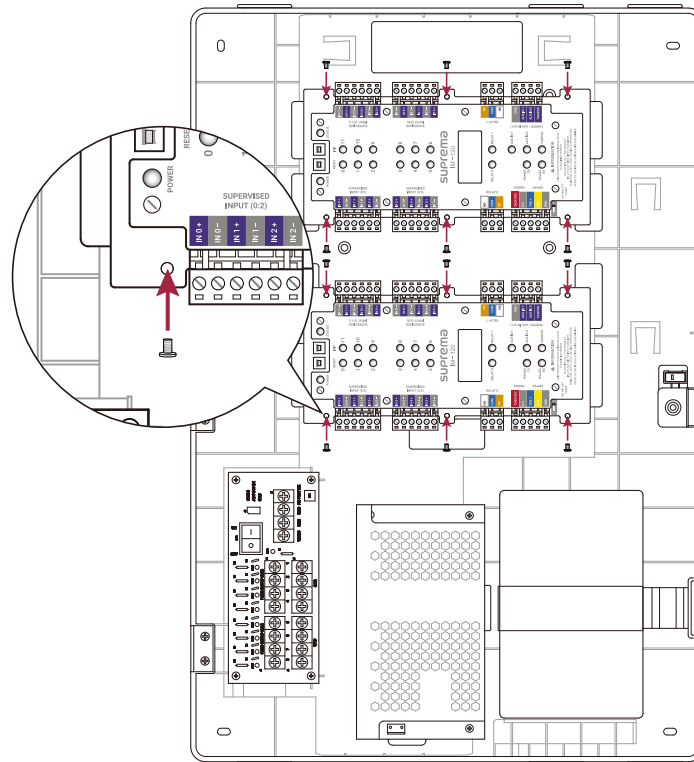
> ⓘ
> - There is no optimal height for installing ENCR-10 on the wall. Install it to a safe and convenient location for you to use.
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> - Fixing screws for the enclosure, the device and the power supply cable are included in the ENCR-10 package. Use each screw correctly by following the details below.
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>   - Fixing screws for the power supply cable (diameter: 3 mm, length: 8 mm) x 1

Power and AUX Input Connection

You can connect an Uninterruptible Power Supply (UPS) to prevent power failure. And a power failure detector or a dry contact output can be connected to the AUX IN terminal.
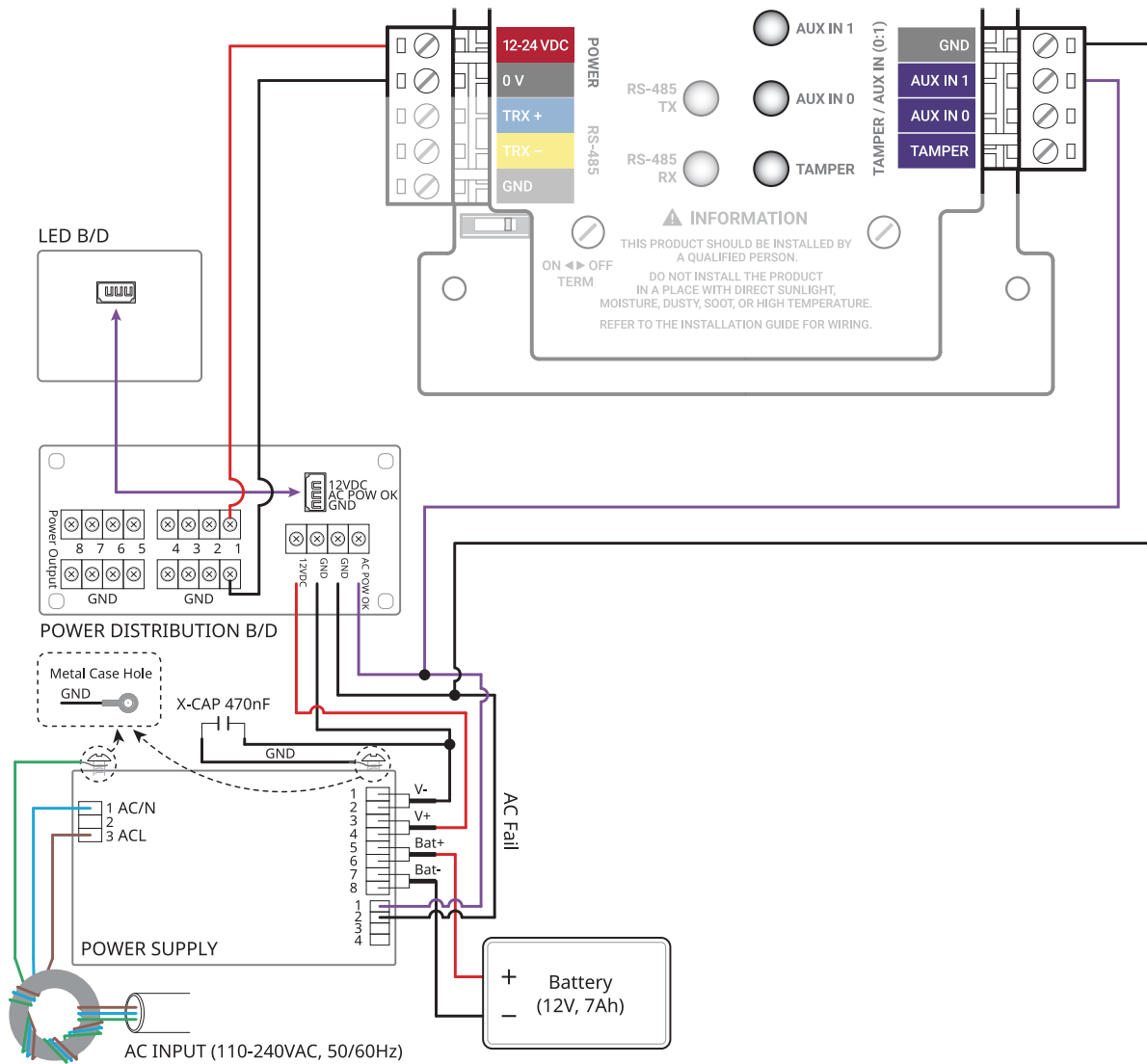
LED B/D

| 12-24 VDC |
| 0 V |
| TRX + |
| TRX − |
| GND |

POWER
RS-485

AUX IN 1
RS-485 TX — AUX IN 0
RS-485 RX — TAMPER

TAMPER / AUX IN (0:1)

| GND |
| AUX IN 1 |
| AUX IN 0 |
| TAMPER |

ON ◄ ► OFF
TERM

⚠ INFORMATION

THIS PRODUCT SHOULD BE INSTALLED BY A QUALIFIED PERSON.

DO NOT INSTALL THE PRODUCT IN A PLACE WITH DIRECT SUNLIGHT, MOISTURE, DUSTY, SOOT, OR HIGH TEMPERATURE.

REFER TO THE INSTALLATION GUIDE FOR WIRING.

Power Output

8 7 6 5   4 3 2 1
GND   GND

12VDC
AC POW OK
GND

12VDC GND GND AC POW OK

POWER DISTRIBUTION B/D

Metal Case Hole
GND

X-CAP 470nF

GND

1 AC/N
2
3 ACL

1
2
3
4
5
6
7
8

V−
V+
Bat+
Bat-

1
2
3
4

AC Fail

POWER SUPPLY

AC INPUT (110-240VAC, 50/60Hz)

+ Battery
− (12V, 7Ah)

⚠

- Make sure to use separate power for the access control device and Input Module.
- 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.

Tamper Connection

If Input Module is detached from the installed location due to an external factor, it can trigger an alarm or save an event log.

> ⓘ • For more information, contact the Suprema technical support team (https://support.supremainc.com).

Product Specifications

| Category	Feature	Specification
General	Model	IM-120
	CPU	Cortex M3 72 MHz
	Memory	512 KB Flash + 64 KB SRAM
	LED	Multi-color • Power - 1 • Status - 1 • RS-485 TX - 1 • RS-485 RX - 1 • Supervised Input - 12 • Relay - 2 • AUX IN - 2 • Tamper - 1
	Operating Temperature	-20 °C ~ 60 °C
	Storage Temperature	-40 °C ~ 70 °C
	Operating Humidity	0 % ~ 95 %, non-condensing
	Storage Humidity	0 % ~ 95 %, non-condensing
	Dimension (W x H x D)	90 x 190 x 21 (mm)
	Weight	203 g
	Certificates	CE, UKCA, KC, FCC, RCM, RoHS, REACH, WEEE
Interface	Supervised Input	12 ch (TTL Input selectable)
	RS-485	1 ch
	Relay	2 relays
	AUX Input	2 ch (AC POWER FAIL)
	Tamper Input	1 ch
Capacity	Text Log	10 ea per port[1]
Electrical	Power	• Voltage: 12 Vdc • Current: Max. 0.2 A
		• Voltage: 24 Vdc • Current: Max. 0.1 A
	Switch Input VIH	Max.: 5 V (Dry Contact)
	Relay	5 A @ 30 VDC Resistive load

• Product specifications are subject to change without notice to improve.

[1] For events that occur while network connection is lost, up to 10 events can be saved per port. When a port is full, each newly logged event will replace the oldest one.

Dimensions

(Unit: mm)

* The tolerance is ±0.3 mm.

190

90

21
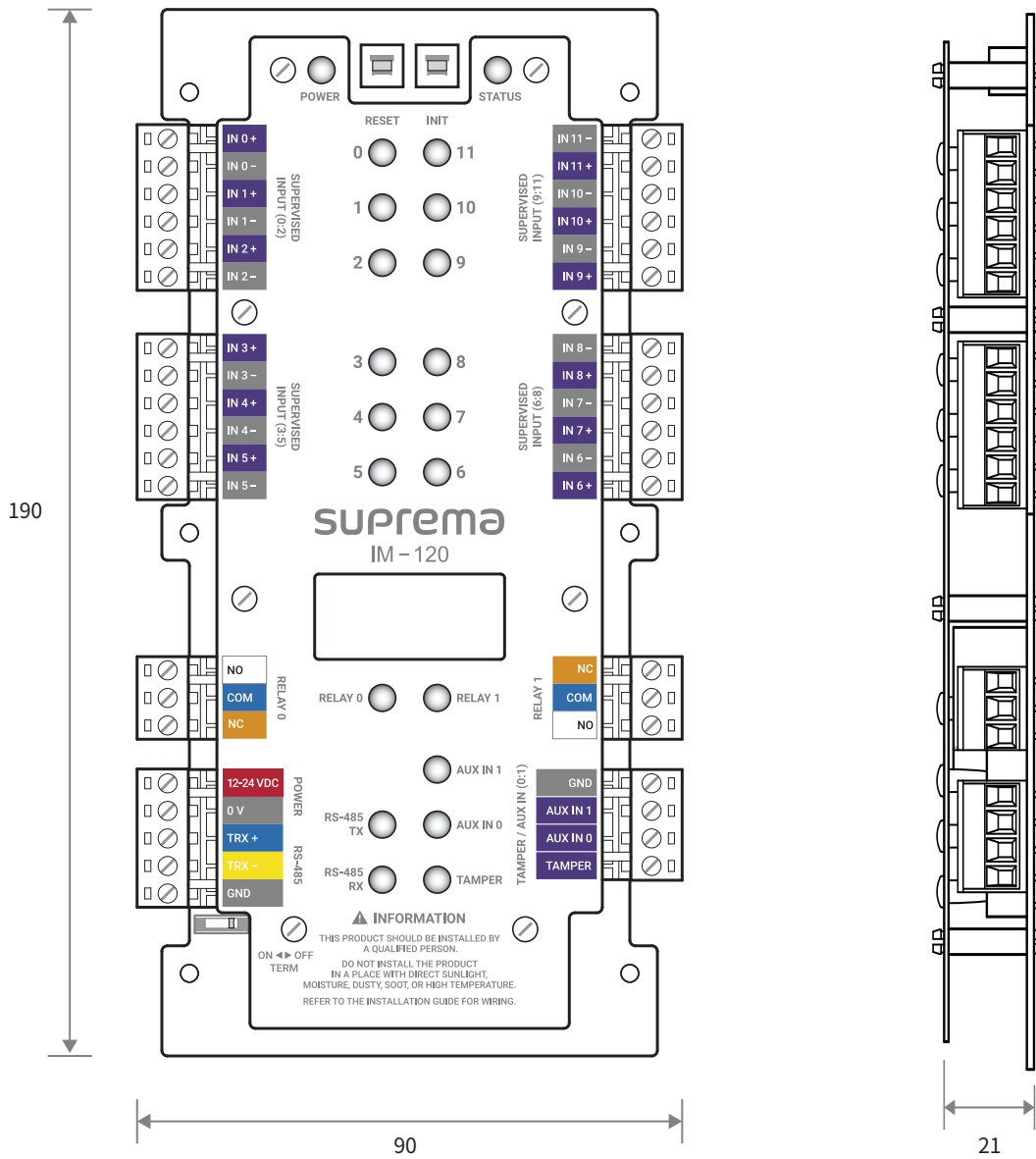
FCC compliance information

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 in a commercial installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions manual, it 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.

- **Modifications**: Any modifications made to this device that are not approved by Suprema Inc. may void the authority granted to the user by the FCC to operate this equipment.

Appendices

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