CoreStation

INSTALLATION GUIDE

Version 1.05

English

EN 101.00.CS-40 V1.05A

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.

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.

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.

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.

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

- The device may malfunction.

Use the product within 0 °C ~ 50 °C and store it at appropriate temperatures, not too low or too high.

- The device may malfunction.

Be careful when cleaning the product.

- Gently wipe the product surface with a clean, dry cloth.
- If disinfecting the product, dampen a clean cloth with a suitable amount of disinfectant alcohol and gently wipe the product surface. Use disinfectant alcohol that contains 70-75% isopropyl alcohol and a clean, lint-free soft cloth.
- Do not spray disinfectant directly onto the product.

Do not use the product for purposes other than its intended use.

- The device may malfunction.

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

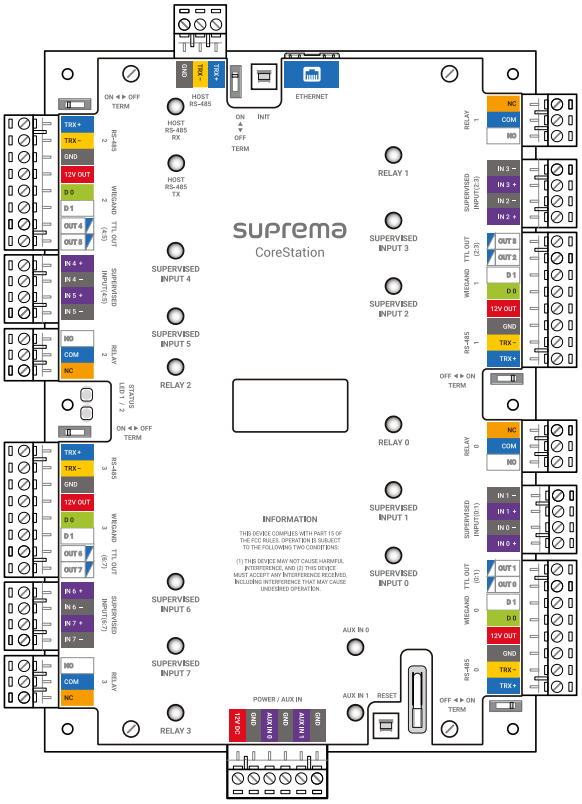
Getting Started

Provides initial procedures for getting started with the device.

Document Number

Document No.	Revision	Title / Description
EN 101.00.CS40	V1.05A	CoreStation Installation Guide
EN 102.00.CS40	V1.00A	CoreStation Setup Manager User Guide
201.00.CS40	V1.01A	CoreStation Intelligent Biometric Controller: Quick Guide
EN 102.00.BS2	V1.8.12A	BioStar 2.8.12 Administrator Guide
EN 101.00.BS2	V1.8.12A	BioStar 2.8.12 Installation Guide
EN 201.00.BS2	V1.01A	BioStar 2 Quick Guide
Warranty_SP_001	V12	Suprema Warranty Policy

Components



CoreStation



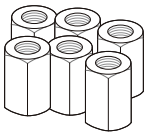
Quick Guide



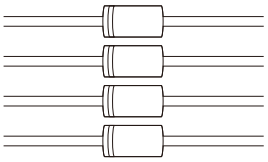
Open Source Software Guide



Fixing Screw x12



Spacer x6



Diode x4

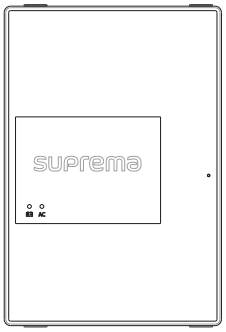
Info

- Components may vary according to the installation environment.

Accessory

This product can be purchased with the enclosure (ENCR-10) as an accessory.

The enclosure includes a power status LED board, power distribution board, power supply, and tamper. Refer to Enclosure Installation for how to install the product in the enclosure.

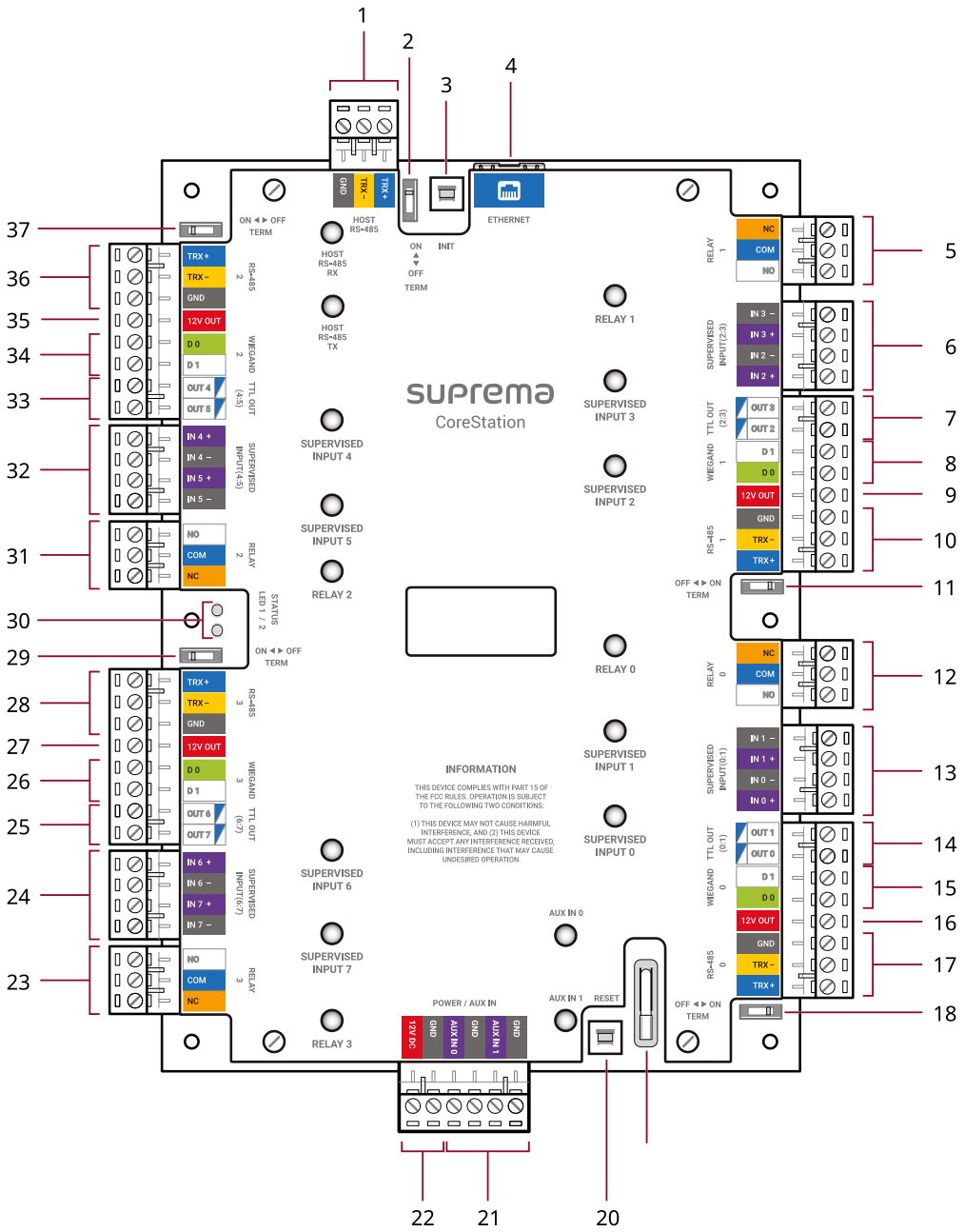


ENCR-10

Info

- The ENCR-10 is designed to be mounted on a wall for use. Install it at a safe and convenient height without restrictions on installation height.
- The ENCR-10 components include screws for housing fixation, screws for product fixation, and screws for power device connection. Use each screw correctly according to its purpose.
  - Fixing screws for the enclosure (diameter: 4 mm, length: 25 mm) x4
  - Fixing screws for the device (diameter: 3 mm, length: 5 mm) x6
  - Fixing screws for the power supply cable (diameter: 3 mm, length: 8 mm) x1

Name and function of each part



No.	Name	No.	Name
1	**HOST RS-485** connection	20	**RESET** button
2	**HOST RS-485** termination resistor switch	21	**AUX IN (0, 1)** connection
3	**INIT** button	22	CoreStation power connection (DC 12V IN)
4	**ETHERNET** connection	23	**RELAY 3** connection

No.	Name	No.	Name
5	**RELAY 1** connection	24	**SUPERVISED INPUT (6:7:)** or **Input (6:7:)** connection
6	**SUPERVISED INPUT (2:3:)** or **Input (2:3:)** connection	25	**OUTPUT (6:7:)** connection
7	**OUTPUT (2:3:)** connection	26	**WIEGAND 3** connection
8	**WIEGAND 1** connection	27	12VDC output
9	12VDC output	28	**RS-485 3** connection
10	**RS-485 1** connection	29	**RS-485 3** termination resistor switch
11	**RS-485 1** termination resistor switch	30	CoreStation status LED
12	**RELAY 0** connection	31	**RELAY 2** connection
13	**SUPERVISED INPUT (0:1:)** or **Input (0:1:)** connection	32	**SUPERVISED INPUT (4:5:)** or **Input (4:5:)** connection
14	**OUTPUT (0:1:)** connection	33	**OUTPUT (4:5:)** connection
15	**WIEGAND 0** connection	34	**WIEGAND 2** connection
16	12VDC output	35	12VDC output
17	**RS-485 0** connection	36	**RS-485 2** connection
18	**RS-485 0** termination resistor switch	37	**RS-485 2** termination resistor switch
19	RTC battery		

Info

- Press the **INIT** button for more than 2 seconds after initializing the product linked to the device to connect it to another device.
- Press the **RESET** button to reboot the product.
- You can use the product's power output (12V, up to 1.5A) to power the Wiegand device when connecting it to the product. If you connect three Wiegand devices that consume 200mA, you can connect devices that consume up to 900mA to the remaining power output terminals.
- The RTC battery capacity is 226mAh, and the expected lifespan may vary depending on the installation environment and usage method. When replacing the RTC battery, please adhere to CR2032.

Communication status LED

LED	Status
HOST RS-485 TX	Orange blinking: Transmitting RS-485 data
HOST RS-485 RX	Green blinking: Receiving RS-485 data
RELAY (0 ~ 3)	Red lit: Relay operation
SUPERVISED INPUT (0 ~ 7)	When using input - Green lit: Normal close - Off: Normal open
	When using supervised input - Green lit: Normal close (short circuit), Normal open, switch on - Off: Switch off
AUX IN (0, 1)	Orange lit: Receiving AUX signal

Access control level

Feature	Level
Destructive Attack	I
Line Security	I
Endurance	IV
Standby Power	I
Single Point Locking Device with Key Locks	I

CoreStation status LED

The product's status can be checked with STATUS LED 1 / 2 located on the left side of the product's front, which sequentially displays the status of Ethernet, RS-485 0, RS-485 1, RS-485 2, RS-485 3, RS-485 HOST, and the system in intervals of one second.

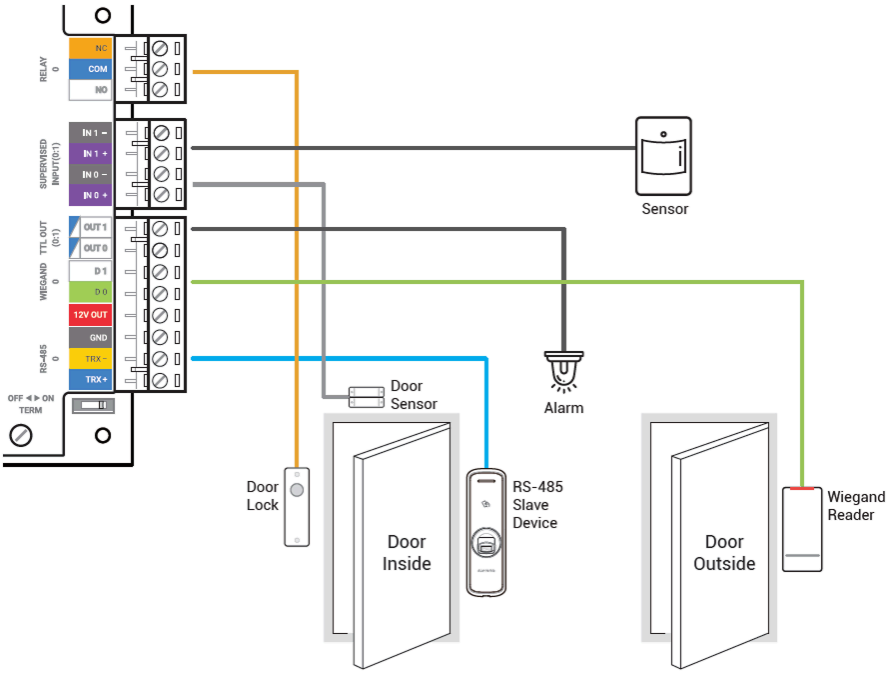
Item	LED 1	LED 2	Status
Ethernet	Red	Red	Dynamic IP connection failed
	Red	Yellow	Waiting for dynamic IP connection
	Red	Sky blue	Static IP connection successful
	Red	Blue	Dynamic IP connection successful
	Red	Magenta	Static IP connection failed
	Red	Off	HW error
RS-485 0	Yellow	Red	No slave device
	Yellow	Yellow	Slave device disconnected
	Yellow	Blue	Slave device normal
	Yellow	Off	HW error
RS-485 1	Green	Red	No slave device
	Green	Yellow	Slave device disconnected
	Green	Blue	Slave device normal
	Green	Off	HW error
RS-485 2	Sky blue	Red	No slave device
	Sky blue	Yellow	Slave device disconnected
	Sky blue	Blue	Slave device normal
	Sky blue	Off	HW error
RS-485 3	Blue	Red	No slave device
	Blue	Yellow	Slave device disconnected

Item	LED 1	LED 2	Status
	Blue	Blue	Slave device normal
	Blue	Off	HW error
RS-485 HOST	Magenta	Red	No slave device
	Magenta	Yellow	Slave device disconnected
	Magenta	Blue	Slave device normal
	Magenta	Off	HW error
System	White	Red	System lock (Device's operational conditions and behavior)
	White	Yellow	System lock (BioStar X's operational conditions and behavior)
	White	Green	BioStar X connection successful
	White	Sky blue	BioStar X connection successful + Tamper on
	White	Blue	Tamper on
	White	Magenta	System lock (Device's operational conditions and behavior) + Tamper on
	White	White	System lock (BioStar X's operational conditions and behavior) + Tamper on
	Magenta	Magenta	Database migration in progress

Installation example

This product is a centralized access control system capable of performing biometric authentication. Designed for enterprise-grade systems, the product can store information for up to 500,000 users and perform 400,000 fingerprint matches per second.

Integrates with BioStar X to enable both access control and time and attendance, and provides various interfaces, including RS-485 (OSDP), Wiegand, supervised input, and AUX.



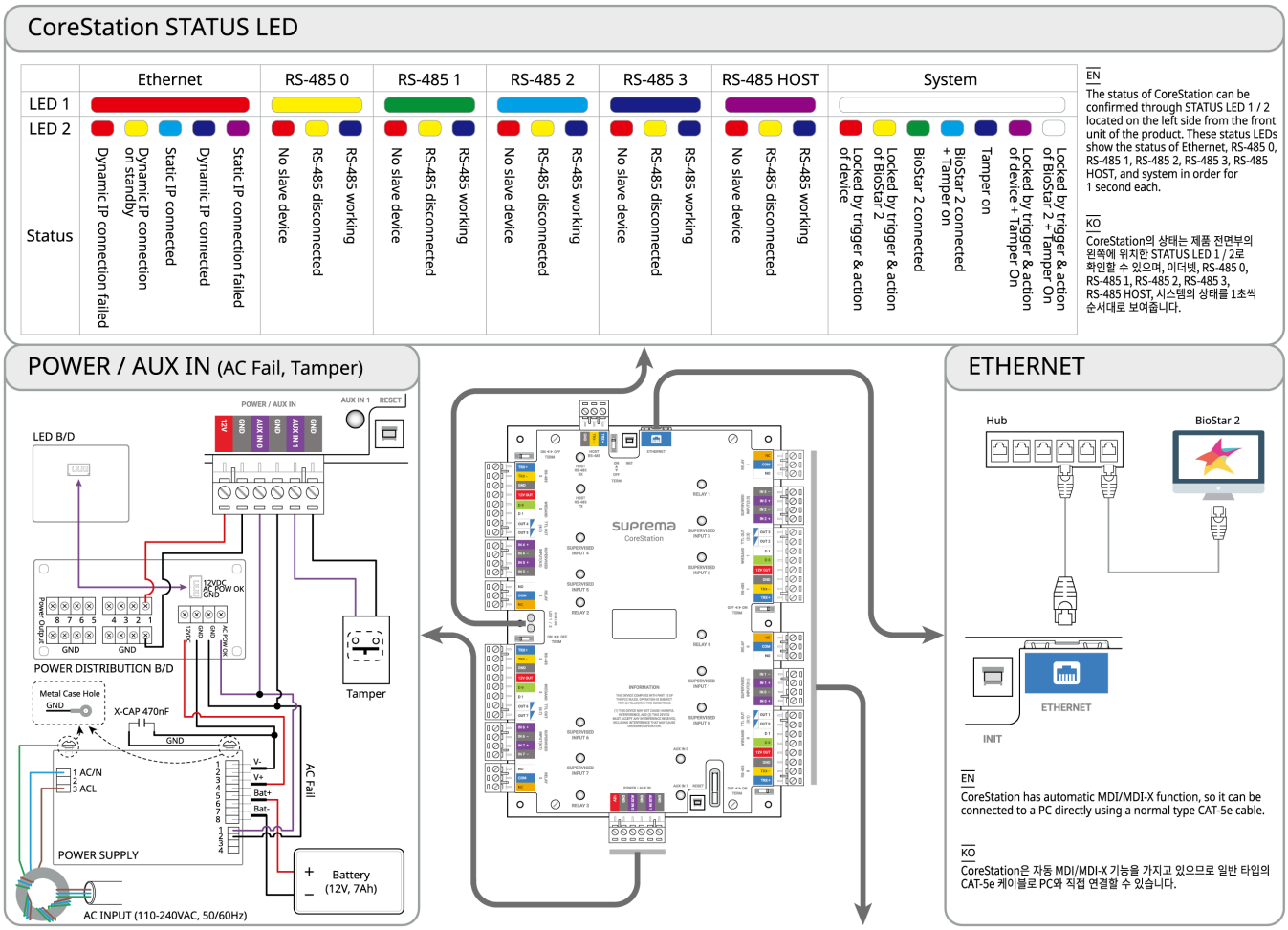
System diagram

Connect up to 64 RS-485 devices, and daisy-chain a Door Module to support up to 132 Wiegand devices.

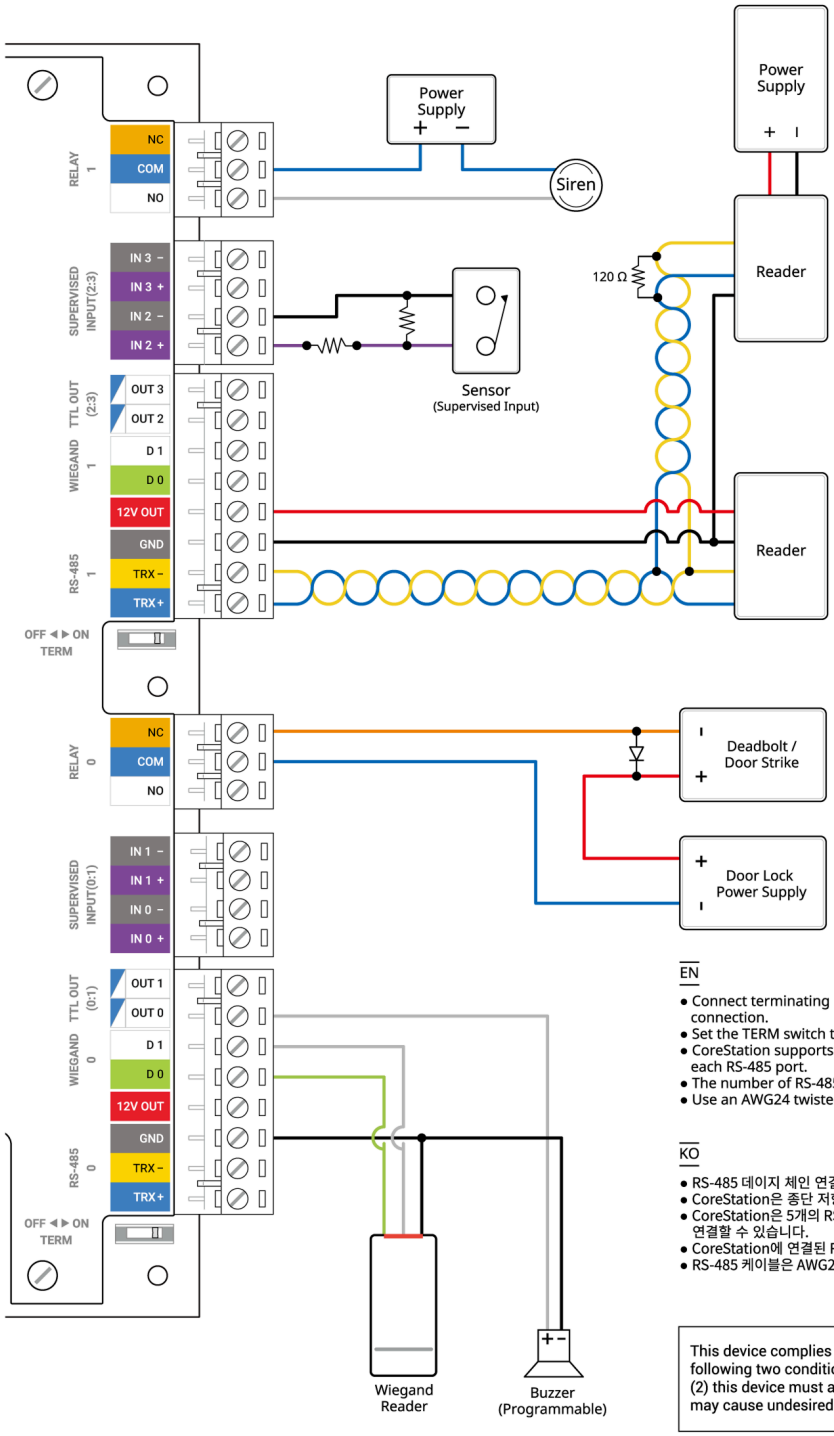


Overall connection diagram

For reliable product usage, it is recommended to use a dedicated housing. The housing includes an LED control board, power control board, power device, battery, and tamper.



Relay | TTL/Supervised Input | TTL Output | Wiegand | Power Output | RS-485



EN

- Connect terminating resistance (120 Ω) to both ends of the RS-485 daisy chain connection.
- Set the TERM switch to ON for CoreStation.
- CoreStation supports 5 RS-485 ports, and up to 31 devices can be connected to each RS-485 port.
- The number of RS-485 devices connected to CoreStation cannot exceed 64.
- Use an AWG24 twisted pair with a maximum length of 1.2 km for the RS-485 cable.

KO

- RS-485 데이지 체인 연결의 양 끝에 종단 저항(120 Ω)을 연결하십시오.
- CoreStation은 종단 저항 스위치(TERM)를 ON으로 설정하십시오.
- CoreStation은 5개의 RS-485 포트를 지원하며 하나의 RS-485 포트에는 최대 31대의 장치를 연결할 수 있습니다.
- CoreStation에 연결된 RS-485 장치는 64대를 초과할 수 없습니다.
- RS-485 케이블은 AWG24, 꼬임선(Twisted Pair), 최대 길이 1.2 km를 사용하십시오.

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.

To get more details and download the guides and BioStar 2, visit www.supremainc.com.

suprema

Info

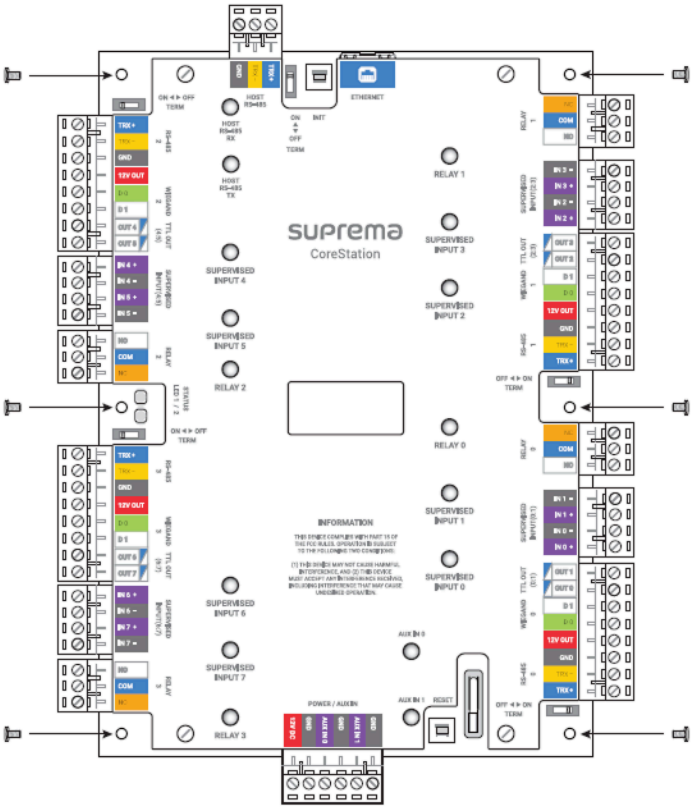
Do not connect to a socket controlled by a switch A.

Installation

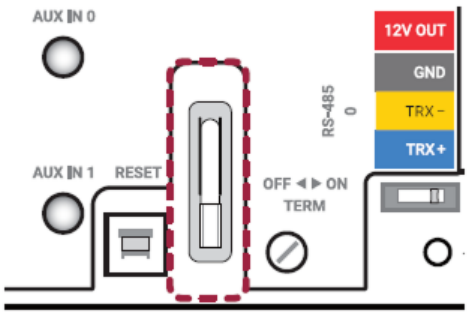
Provides the complete installation procedures and connection examples required for the device.

Product Fixation

1. Secure the spacer with fixing screws at the location where the product will be mounted.
2. Tighten the product onto the secured spacer using fixing screws.



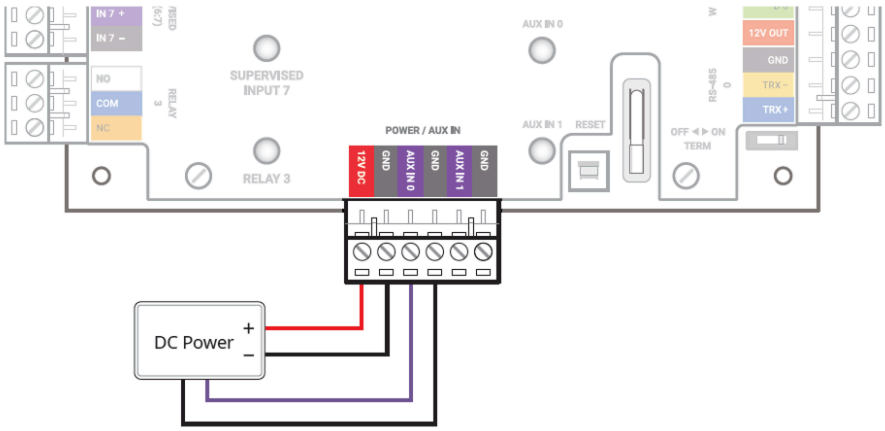
3. Remove the discharge prevention film attached to the RTC battery.



Info

- The RTC (Real Time Clock) battery is used to keep accurate time even when the product's power is off.
- The RTC battery capacity is 226mAh, and the expected lifespan may vary depending on the installation environment and usage method. When replacing the RTC battery, please adhere to CR2032.

Power supply connection



Caution

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

Info

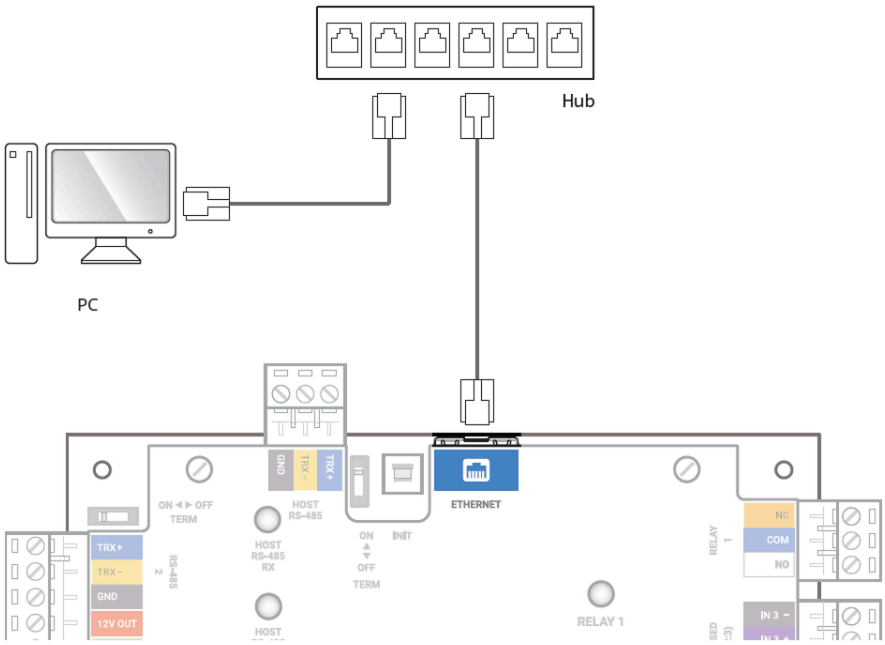
It is recommended to connect and use an Uninterruptible Power Supply (UPS) to prevent power failure.

Network Connection

TCP/IP

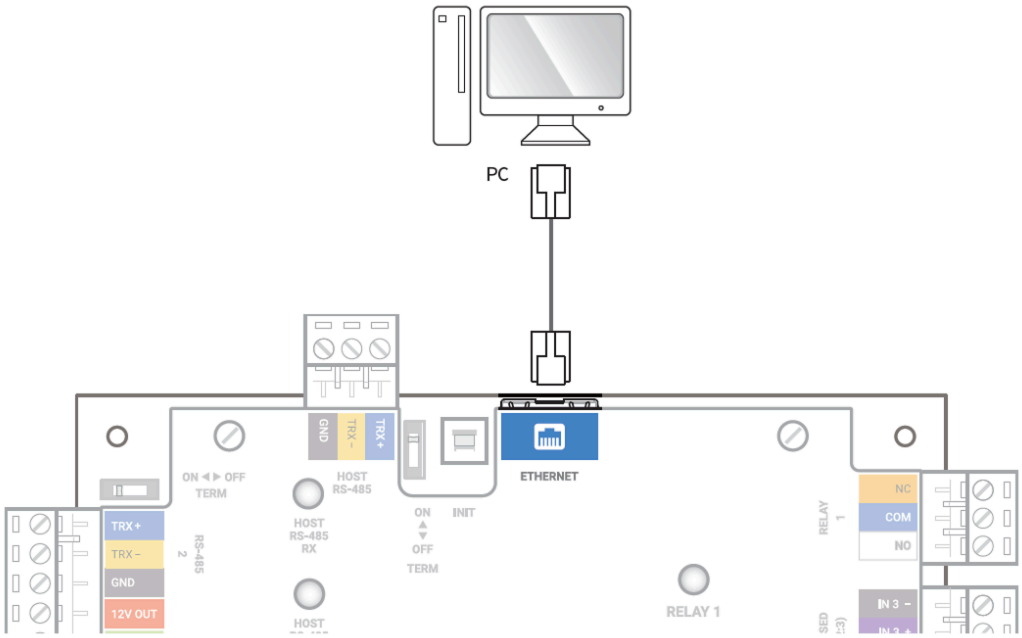
LAN connection (connecting to a hub)

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



LAN connection (connecting to a PC directly)

This product has automatic MDI/MDIX functionality, so you can connect directly to a PC using a standard CAT-5e cable.



Network ports and services

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

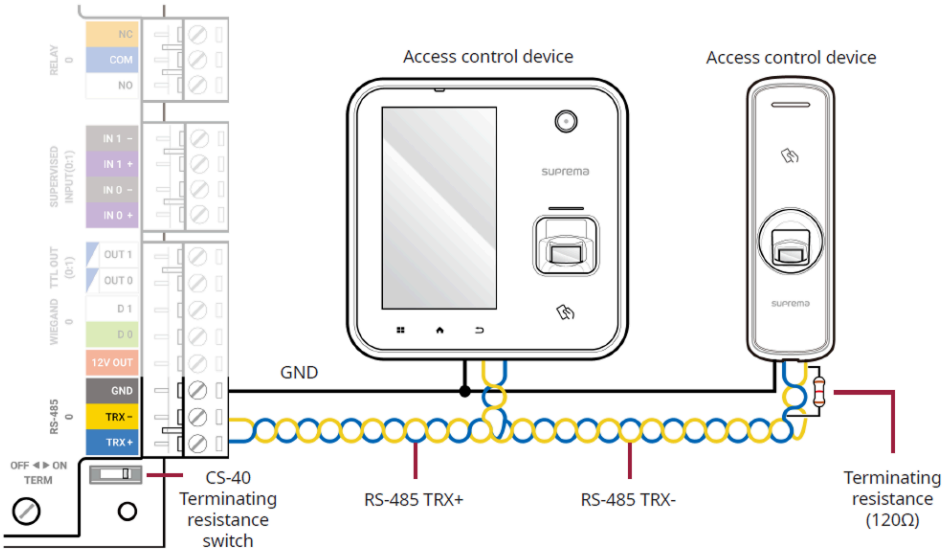
Protocol	Service Description
TCP	Used for communication services between the server and the device, and for the device operation status switching service.
UDP	Used for the device discovery service to search for devices on the network.

Info

These ports are used to provide normal network features of the product. When configuring firewall rules or network security settings, allow the use of these ports.

RS-485 Connection

This product supports five RS-485 ports, and a single RS-485 port can connect up to 31 devices.



Info

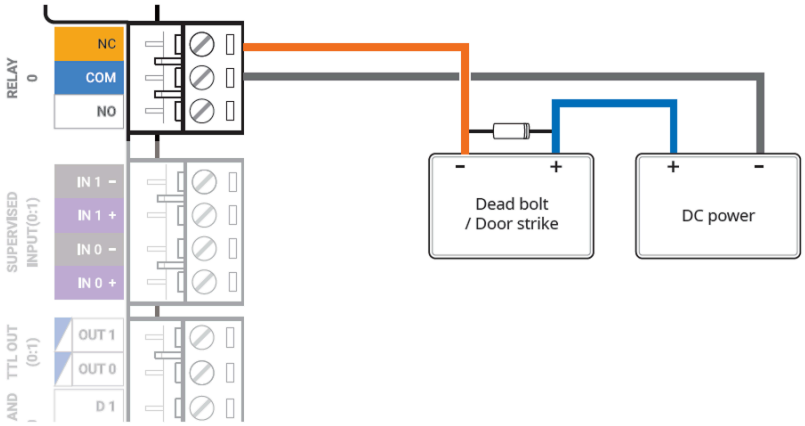
- The total number of RS-485 devices connected to the product must not exceed 64.
- Use AWG26 or larger for RS-485 cables, and all wiring must comply with ANSI/NFPA 70 standards.
- Use an AWG24 twisted pair with a maximum length of 1.2 km for the RS-485 cable.
- It is recommended to use RS-485 cables with a characteristic impedance of 120 Ω.
- Connect termination resistors (120 Ω) at both ends of the RS-485 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 this product's termination resistor switch to ON.

Relay Connection

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.

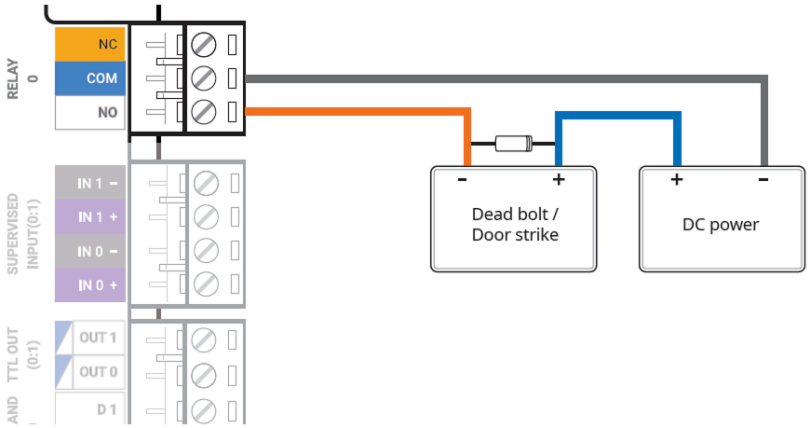
> **Info**
>
> Connect a diode to both ends of the power input as shown in the figure below when installing a deadbolt or a door strike. Make sure to connect the Cathode (direction to the stripe) to the + part of the power while paying attention to the direction of the diode.



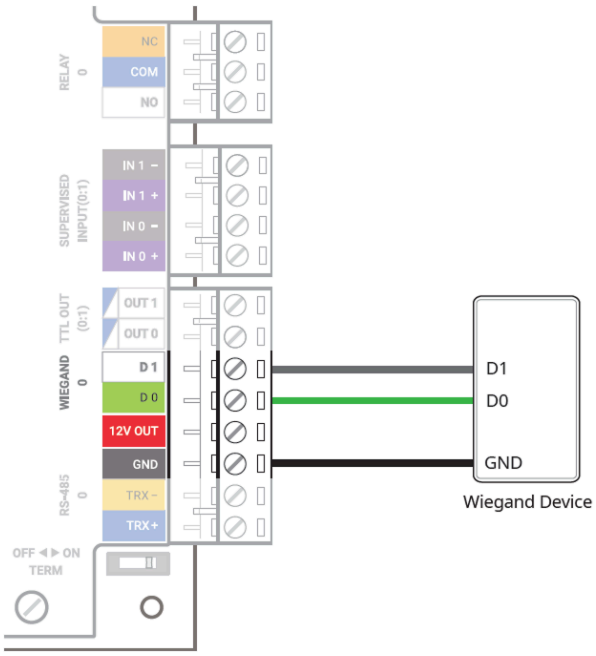
Fail Secure Lock

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.

> **Info**
> 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.

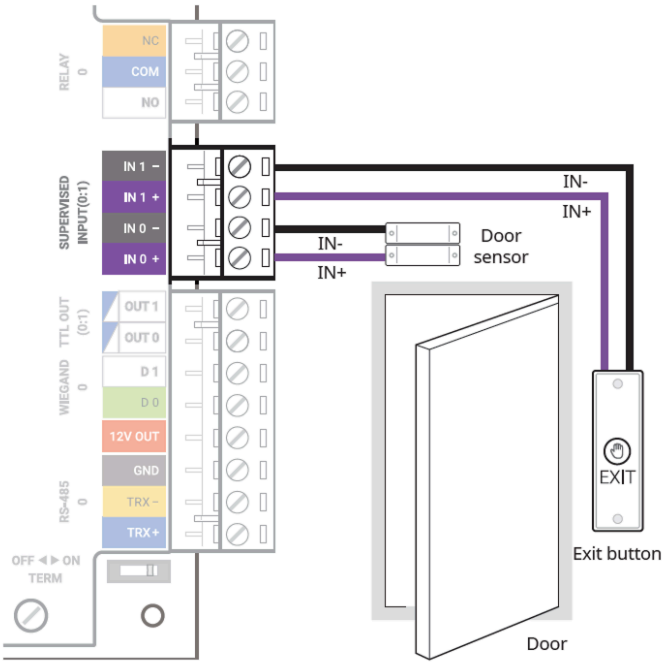


Wiegand Connection



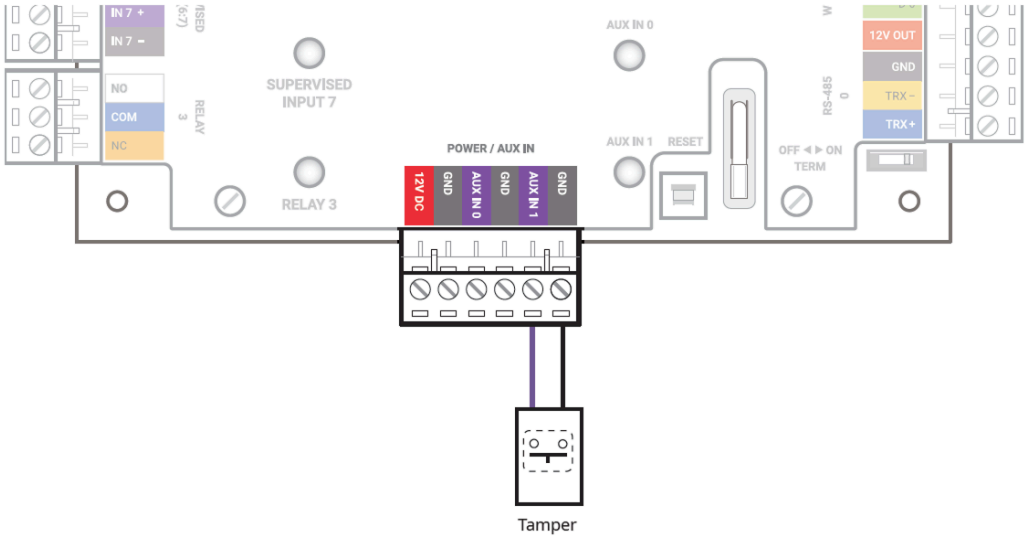
Door sensor and exit button

The SUPERVISED INPUT 0 ~ 7 terminals can be set to be used as general inputs or as Supervised Inputs.



AUX IN

You can connect a power failure detector or tamper to the AUX IN port.

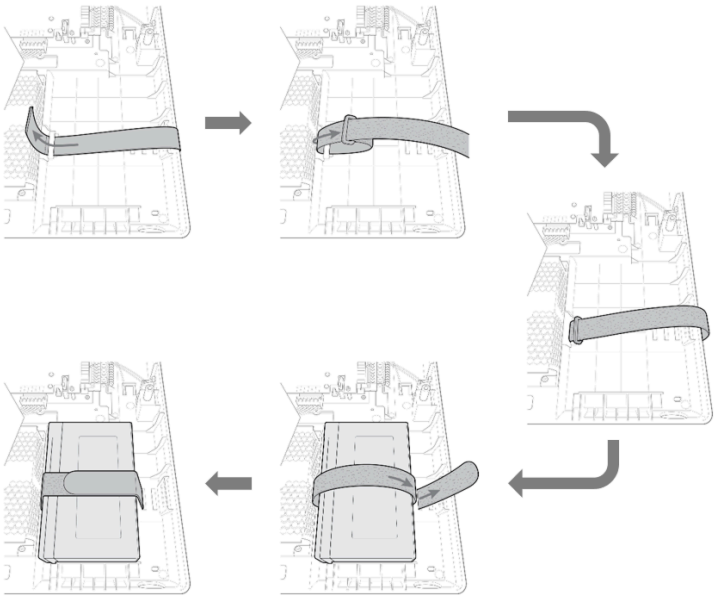


Enclosure installation

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

Backup battery fixing

Insert the battery Velcro strap into the case, then secure the battery.

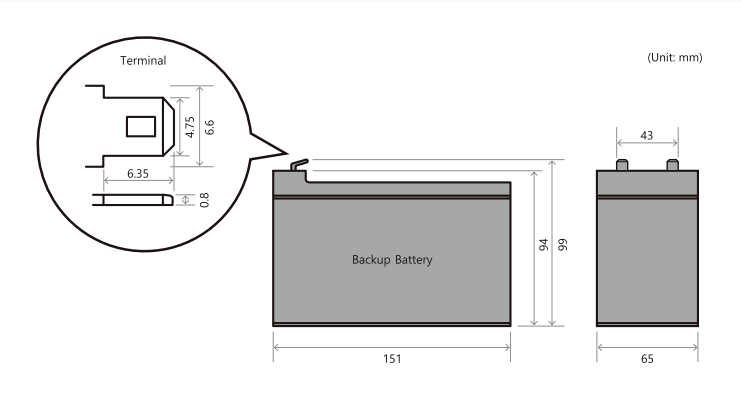


Caution

Use a backup battery that is 12 VDC specification and 7 Ah or higher. This product has been tested with the 'ES7-12' product from 'ROCKET', and it is recommended to use products equivalent to 'ES7-12'.

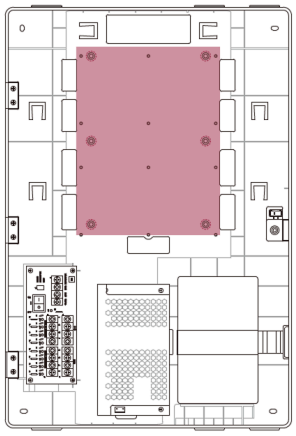
Info

- The backup battery is sold separately.
- Be sure to check the size and shape of the backup battery terminals. If the size of the backup battery exceeds the recommended specifications, it may not fit in the case or the case may not close after installation. Additionally, if the shape and size of the terminals are different, you will not be able to connect the battery using the provided cable.

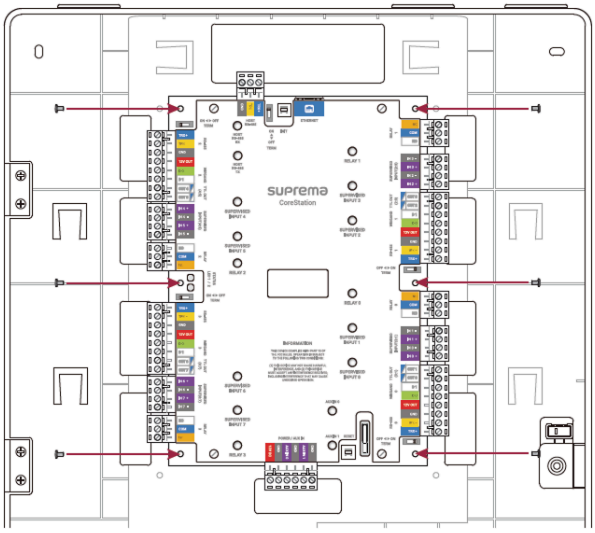


Product Fixation

1. Check the location to mount the product in the enclosure.



2. Place the product in the enclosure according to the mounting location and secure it with screws.



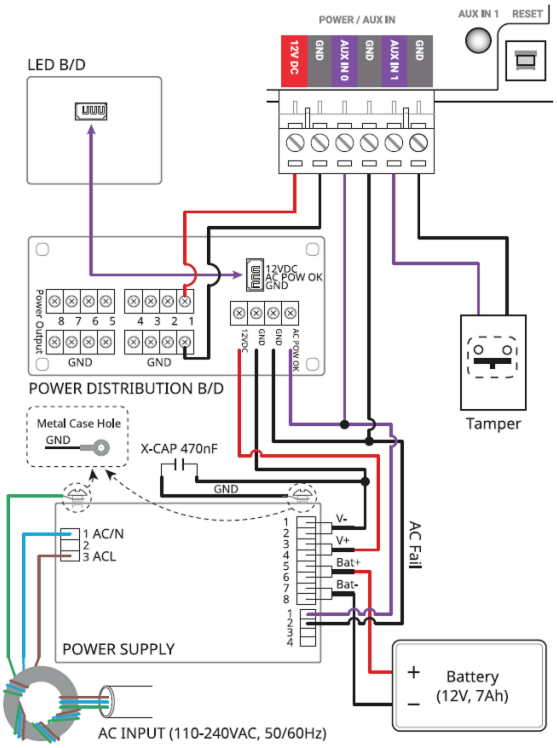
Info

- The ENCR-10 is designed to be mounted on a wall for use. Install it at a safe and convenient height without restrictions on installation height.
- The ENCR-10 components include screws for housing fixation, screws for product fixation, and screws for power device connection. Use each screw correctly according to its purpose.
  - Fixing screws for the enclosure (diameter: 4 mm, length: 25 mm) x4
  - Fixing screws for the device (diameter: 3 mm, length: 5 mm) x6
  - Fixing screws for the power supply cable (diameter: 3 mm, length: 8 mm) x1

Power and AUX input, tamper connection

To prevent power interruptions, you can connect an uninterruptible power supply (UPS), and contact outputs from power outage detectors or other devices can be connected to the AUX IN terminal.

You can also connect to the tamper to trigger an alarm or leave an event log if the housing opens due to external factors.



Caution

- Make sure to use separate power for the access control device and products.
- 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 backup battery that is 12 VDC specification and 7 Ah or higher. This product has been tested with the 'ES7-12' product from 'ROCKET', and it is recommended to use products equivalent to 'ES7-12'.

Factory default

You can factory reset the CoreStation in the Corestation Setup Manager.

1. Access the Corestation Setup Manager and click **CONFIGURE**.
2. Click **Factory Default**.

Info

- You can only use Factory Default when the root certificate is stored on the device.
- You can view or manage the network settings of CoreStation and monitor the status of slave devices, input and output ports, and Wiegand ports by accessing the Corestation Setup Manager.
- CoreStation Setup Manager is supported on firmware version 1.3.1 or later. Connect to BioStar X to upgrade to the latest firmware version when using a version lower than 1.3.1.
- For more information about the CoreStation Setup Manager, see the CoreStation Setup Manager.
- The latest BioStar X version can be checked when the device is connected to the network and can be reset.
- For more information, contact the Suprema Technical Support Team.

Product Specifications

Provides key specifications of the product, including size, features, and performance.

General

Model Name	**CS-40**	
CPU	**1.4 GHz Octa-core**	
Memory	**8 GB Flash + 1 GB RAM**	
Crypto Chip	**Supported**	
LED	**Multi-color**	• **STATUS: 2ea** • **HOST RS-485 TX: 1ea** • **HOST RS-485 RX: 1ea** • **SUPERVISED INPUT: 8ea** • **RELAY: 4ea** • **AUX IN: 2ea**
Operating Temperature	**0 °C ~ 50 °C**	
Storage Temperature	**-40 °C ~ 70 °C**	
Operating Humidity	**0 % ~ 80 %, non-condensing**	
Storage Humidity	**0 % ~ 95 %, non-condensing**	
Operational Ambient Conditions	**0 °C ~ 49 °C**	
Authentication	**CE, UKCA, KC, FCC, RCM, RoHS, REACH, WEEE, ETL Listed to UL 294**	

Capacity

Max. User	**500,000**[1)]

Max. Credentials (1:N)	**Face: 4,000**[2)]
Max. Credentials (1:1)	• **Face: 30,000**[2)] • **Card: 500,000** • **PIN: 500,000**
Max. Text logs	**5,000,000**

Interface

Ethernet	**Supported (10/100 Mbps, auto MDI/MDI-X)**
Network Protocol	**TCP, UDP**
RS-485	**5 ch**
RS-485 Communication Protocol	**OSDP V2 compliant**
Wiegand	**4 ch**
Relay	**4 relays**
Input	**8 ch**[3)]
Output	**8 ch**
Supervised Input	**8 ch**[3)]
AUX Input	**2 ch (AC POWER FAIL, Tamper)**

Electrical

Power	**CoreStation**	**Voltage: 12 Vdc / Current: Max. 3 A**
	Power Supply (SMPS) AC	**110 ~ 240 VAC, 50/60 Hz**

	INPUT	
Power Output	**12 Vdc**	**Current: Max. 1.5 A**
Switch Input VIH	• **Min.: 3 V** • **Max.: 5 V**	
Switch Input VIL	**Max.: 1 V**	
Relay	**5 A @ 30 VDC Resistive load**	

Dimensions and Weight

The dimensional tolerance is ±0.3 mm.



1) This is based on users enrolled without credentials.

2) Facial authentication is supported only by FaceStation 2 and FaceLite.

3) You can choose between Input or Supervised input.

Info

- Product specifications are subject to change without notice for performance improvement.
- When this product is a master device, connecting a device with a fingerprint sensor as a slave allows authentication of fingerprints using the slave device.
  - Max. Fingerprint Credentials (1:N:): 100,000
  - Max. Fingerprint Credentials (1:1:): 500,000
- All the supplementary equipment (card readers, keypads and fingerprint readers) should be UL294 compliant to have a UL294 compliant complete access control system.
- For detailed information on products or troubleshooting, refer to the following link.

Regulatory Information

Provides information on regulations and certifications complied with by the product.

FCC Compliance Information

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES.

Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Info

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body. Do not install or operate this device and its antenna in conjunction with any other antenna or RF transmission device.

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

Suprema Inc.

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Appendices

Includes legal notices contained in the product.

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- This product uses the “OpenSSL”, which is licensed under the OpenSSL and Original SSLeay licenses. For more information about the OpenSSL and Original SSLeay licenses, please see the OpenSSL License and Original SSLeay License.
- The source modified based on Linux kernel 3.x, glibc library, and QT library included in this product can be downloaded by contacting the Suprema Technical Support Team.

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