

# CoreStation

## INSTALLATION GUIDE

Version 1.05  
English  
EN 101.00.CS-40 V1.05A

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# 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.



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



## Warning

### Installation

**When using a high-capacity power supply, please pay special attention to avoid miswiring.**

- Miswiring may result in serious fire, electric shock, or product damage.

**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

**Please read this manual before installing the product to ensure a safe and correct installation.**

**When wiring the power cable and other cables, make sure to connect them with the power turned off for all devices involved.**

- The product may malfunction.

**Before connecting power to the product, double-check the manual to ensure that the wiring is correct, then connect the power.**

**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 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 0 °C to 50 °C.**

- The product may malfunction.

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

- Wipe the product with a clean and dry towel.
- If you need to sanitize the product, moisten the cloth or the wipe with a proper amount of rubbing alcohol and gently clean all exposed surfaces including 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.

### **RTC Battery**

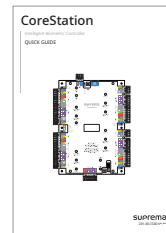
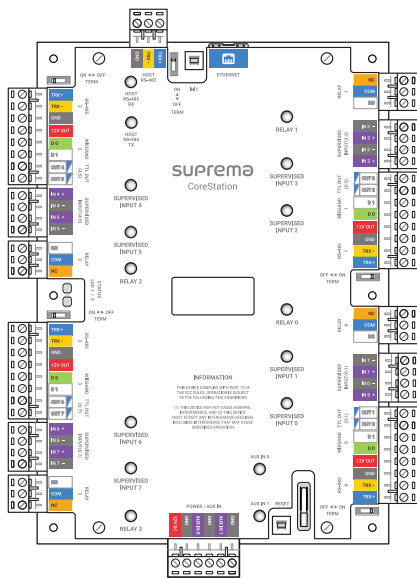
Use of an unapproved or incorrect type of battery may result in a risk of explosion. Discard the battery according to the appropriate regional or international waste regulations.

# Introduction

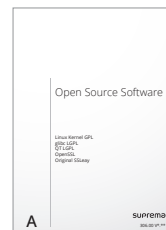
## Document Number

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

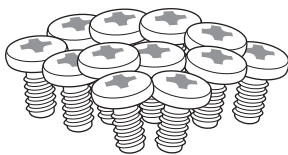
## Components



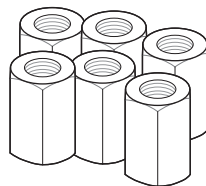
Quick Guide



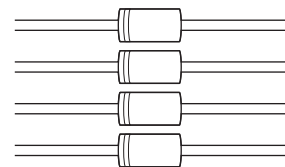
Open Source Software Guide



Fixing Screw x12



Spacer x6



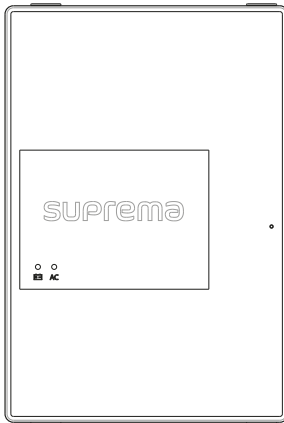
Diode x4



Components may vary according to the installation environment.

## Accessory

You can purchase an enclosure with CoreStation as an accessory. The enclosure includes a power status LED board, power distribution board, power supply, and tamper. To learn how to install the CoreStation in the enclosure, refer to [Using the CoreStation with the enclosure](#).

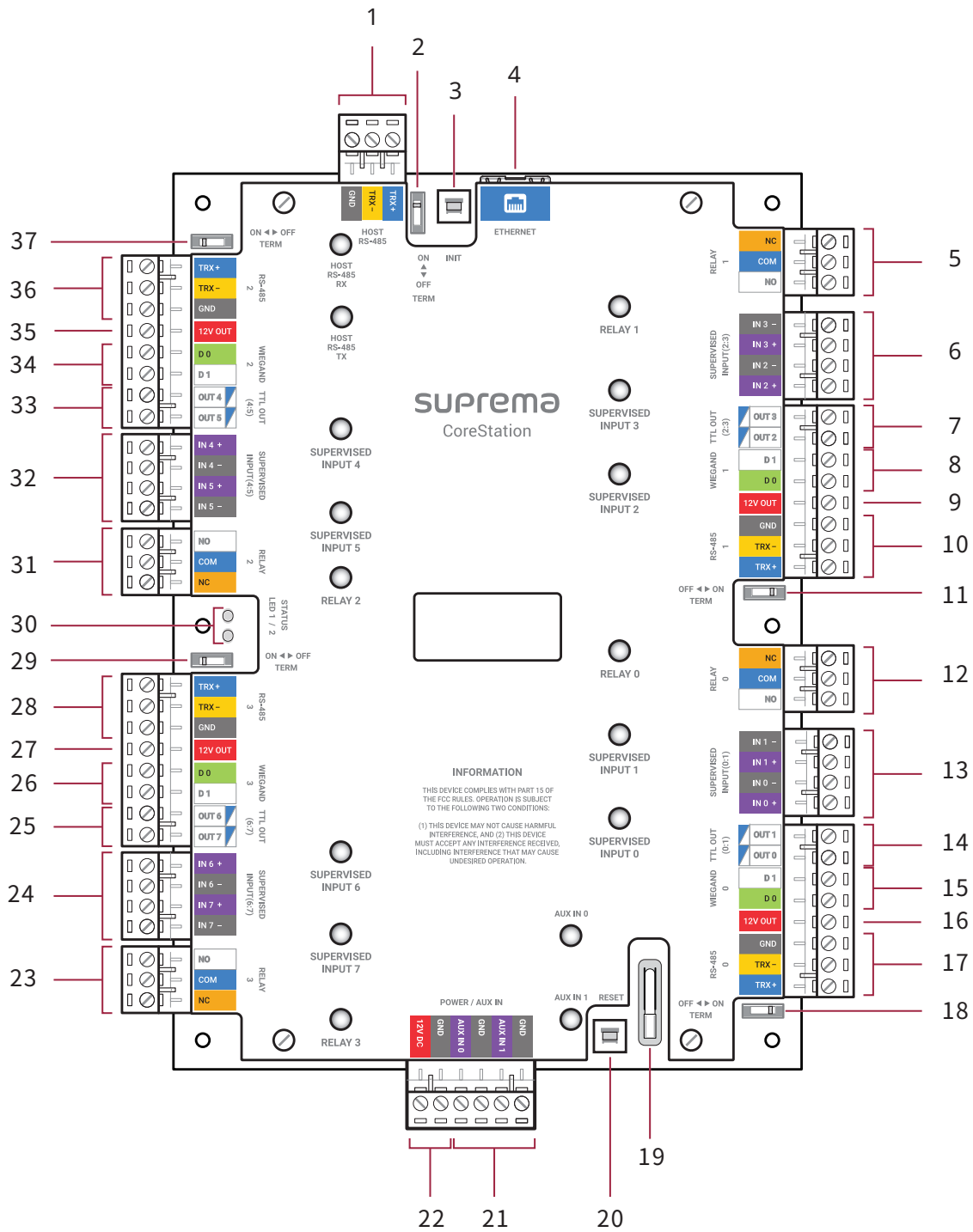


ENCR-10



- 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, CoreStation, 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 CoreStation (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	No.	Name
1	HOST RS-485 connection	20	RESET button
2	HOST RS-485 terminating resistance switch	21	AUX IN (0, 1) connection
3	INIT button	22	CS-40 power connection (DC 12V IN)
4	Ethernet connection	23	Relay 3 connection
5	Relay 1 connection	24	TTL input (6, 7) or supervised input (6, 7) connection
6	TTL input (2, 3) or supervised input (2, 3) connection	25	TTL output (6, 7) connection
7	TTL output (2, 3) connection	26	Wiegand 3 connection
8	Wiegand 1 connection	27	12V output
9	12V output	28	RS-485 3 connection
10	RS-485 1 connection	29	RS-485 3 terminating resistance switch
11	RS-485 1 terminating resistance switch	30	CS-40 status LED
12	Relay 0 connection	31	Relay 2 connection
13	TTL input (0, 1) or supervised input (0, 1) connection	32	TTL input (4, 5) or supervised input (4, 5) connection
14	TTL output (0, 1) connection	33	TTL output (4, 5) connection
15	Wiegand 0 connection	34	Wiegand 2 connection
16	12V output	35	12V output
17	RS-485 0 connection	36	RS-485 2 connection
18	RS-485 0 terminating resistance switch	37	RS-485 2 terminating resistance switch
19	RTC battery		



- Press and hold the **INIT** button for 2 seconds or longer to initialize the CS-40 currently linked with a device and connect it to a different device.
- The power output (12V, up to 1.5A) of CS-40 can be used as the power for a Wiegand device when CS-40 and the Wiegand device are connected. In other words, when 3 Wiegand devices that consume 200mA are connected, a device that consumes up to 900mA can be connected to the remaining power output terminal.
- RTC battery capacity is 226mah. Life expectancy of RTC battery may differ depending on the installation environment and how it is performed. When replacing RTC battery, please use to be compliant with CR2032.



## Communication status LED

LED	Status
HOST RS-485 TX	Orange flashing: Transmitting RS-485 data
HOST RS-485 RX	Green flashing: Receiving RS-485 data
RELAY (0 ~ 3)	Red lighting: Relay operation
SUPERVISED INPUT (0 ~ 7)	TTL input <ul style="list-style-type: none"> <li>• Green lighting: Normal Close</li> <li>• Off: Normal Open</li> </ul> Supervised Input <ul style="list-style-type: none"> <li>• Green lighting: Normal Close (short circuit), Normal Open, Switch On</li> <li>• Off: Switch Off</li> </ul>
AUX IN (0, 1)	Orange lighting: Receiving AUX signal

## The Levels of Access Control

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

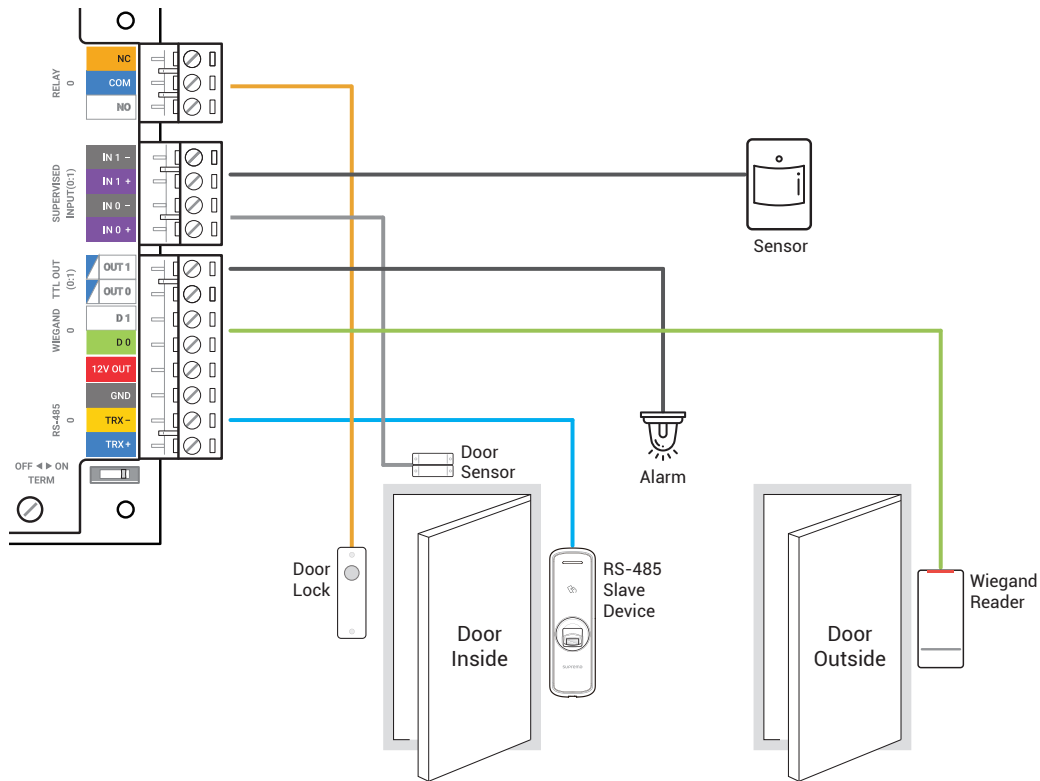
## CS-40 status LED

The status of CS-40 can be confirmed through STATUS LED 1 / 2 located on the left side from the front unit of the product. These status LEDs show the status of Ethernet, RS-485 0, RS-485 1, RS-485 2, RS-485 3, RS-485 HOST, and system in order for 1 second each.

Feature	LED 1	LED 2	Status
Ethernet	Red	Red	Connection to a dynamic IP failed.
	Red	Yellow	Connection to a dynamic IP is on standby.
	Red	Sky blue	Connection to a static IP succeeded.
	Red	Blue	Connection to a dynamic IP succeeded
	Red	Magenta	Connection to a static IP failed.
	Red	Off	HW error
RS-485 0	Yellow	Red	No slave device
	Yellow	Yellow	The slave device is disconnected.
	Yellow	Blue	The slave device is normal.
	Yellow	Off	HW error
RS-485 1	Green	Red	No slave device
	Green	Yellow	The slave device is disconnected.
	Green	Blue	The slave device is normal.
	Green	Off	HW error
RS-485 2	Sky blue	Red	No slave device
	Sky blue	Yellow	The slave device is disconnected.
	Sky blue	Blue	The slave device is normal.
	Sky blue	Off	HW error
RS-485 3	Blue	Red	No slave device
	Blue	Yellow	The slave device is disconnected.
	Blue	Blue	The slave device is normal.
	Blue	Off	HW error
RS-485 HOST	Magenta	Red	No slave device
	Magenta	Yellow	The slave device is disconnected.
	Magenta	Blue	The slave device is normal.
	Magenta	Off	HW error
System	White	Red	System locked (by trigger & action of device)
	White	Yellow	System locked (by trigger & action of BioStar 2)
	White	Green	Connection to BioStar 2 succeeded
	White	Sky blue	Connection to BioStar 2 succeeded + Tamper ON
	White	Blue	Tamper ON
	White	Magenta	System locked (by trigger & action of device) + Tamper ON
	White	White	System locked (by trigger & action of BioStar 2) + Tamper ON
	Magenta	Magenta	Migrating the database

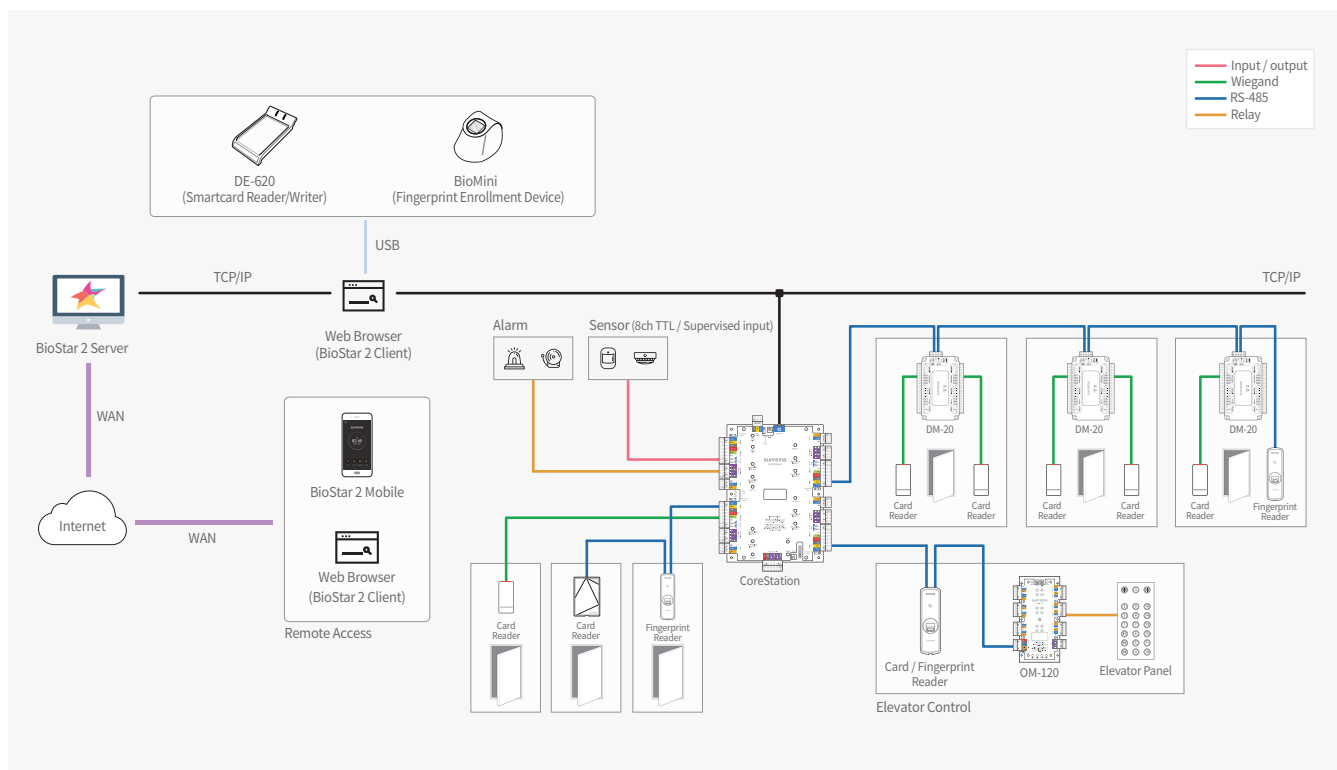
## Installation example

CS-40 is a centralized access control system that can perform biometric authentication. CS-40, designed as an enterprise system, can save the information of up to 500,000 users and execute matching of 400,000 fingerprints per second. Both access control and attendance management can be used through the linkage with BioStar 2, and various interfaces are provided, including RS-485 (OSDP), Wiegand, Supervised input, and AUX.



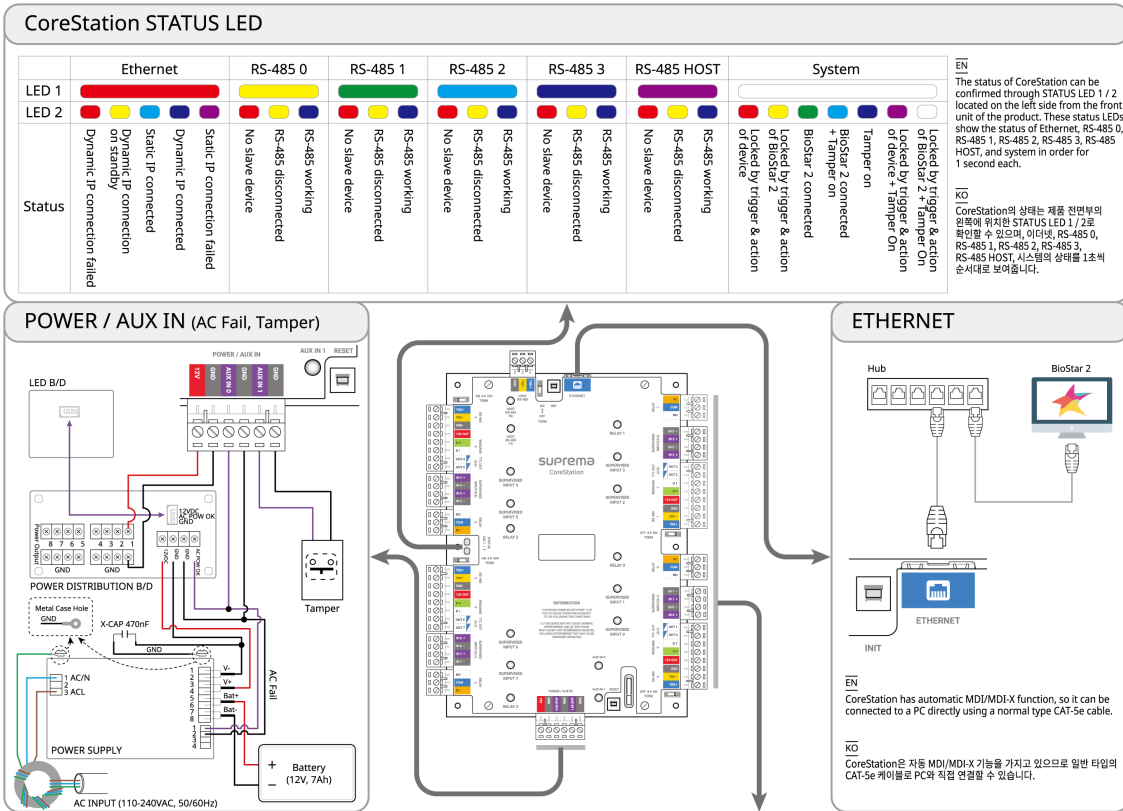
## System diagram

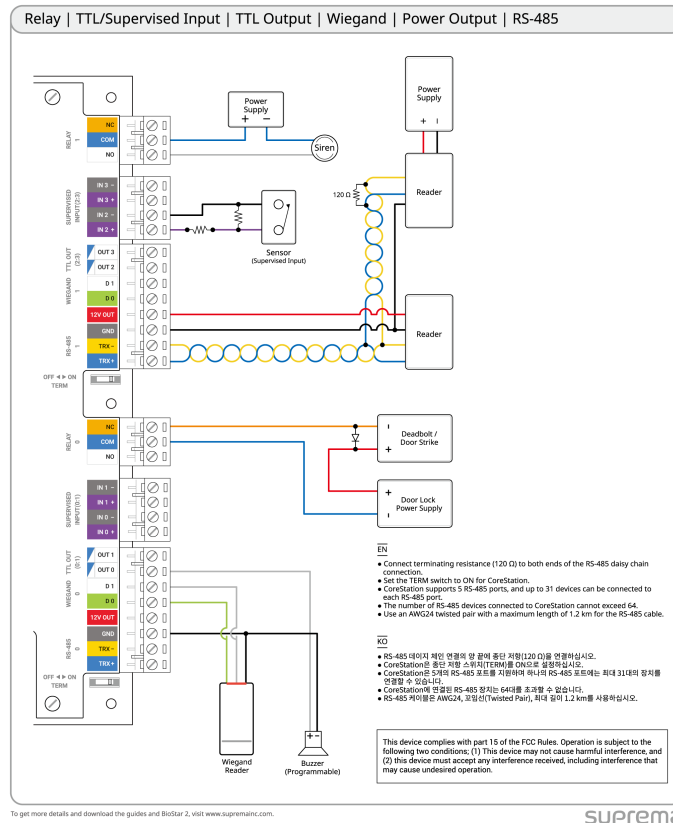
Up to 64 RS-485 devices can be connected to CS-40, and when DM-20 is connected using a daisy chain, Wiegand devices can be expanded up to 132.



## Overall Connection Diagram

The enclosure contains an LED control board, power distribution board, power supply, battery, and tamper.

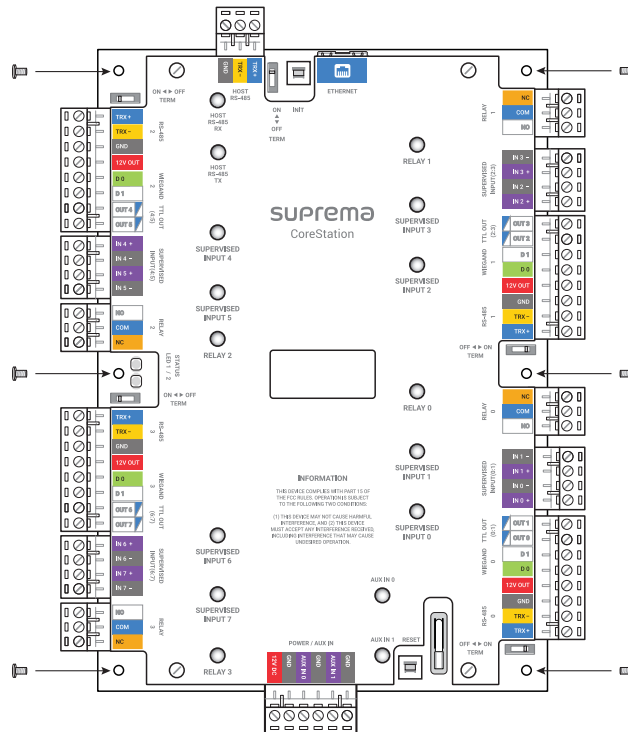




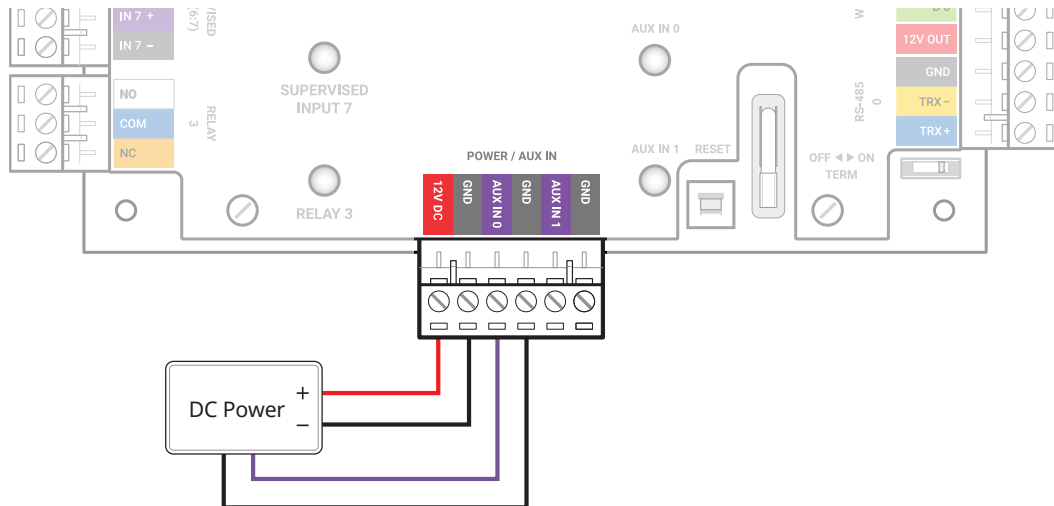
- Do not connect to A receptacle controlled by A switch.

# Installation

- 1 Fix a spacer on the position to mount CoreStation using a fixing screw.
- 2 Fix the product on top of the fixed spacer firmly using a fixing screw.



## Power Connection



- Make sure to use separate power for the access control device and CS-40.
- 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.



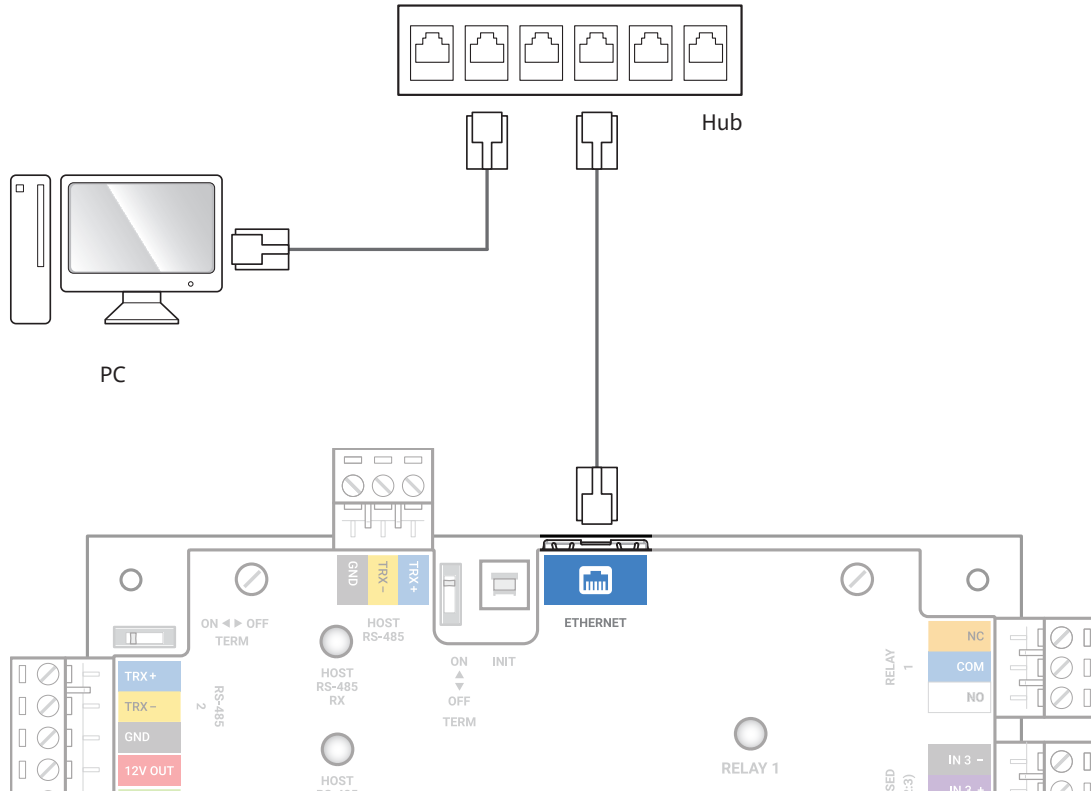
- It is recommended to connect and use an Uninterruptible Power Supply (UPS) to prevent power failure.

# Network connection

## TCP/IP

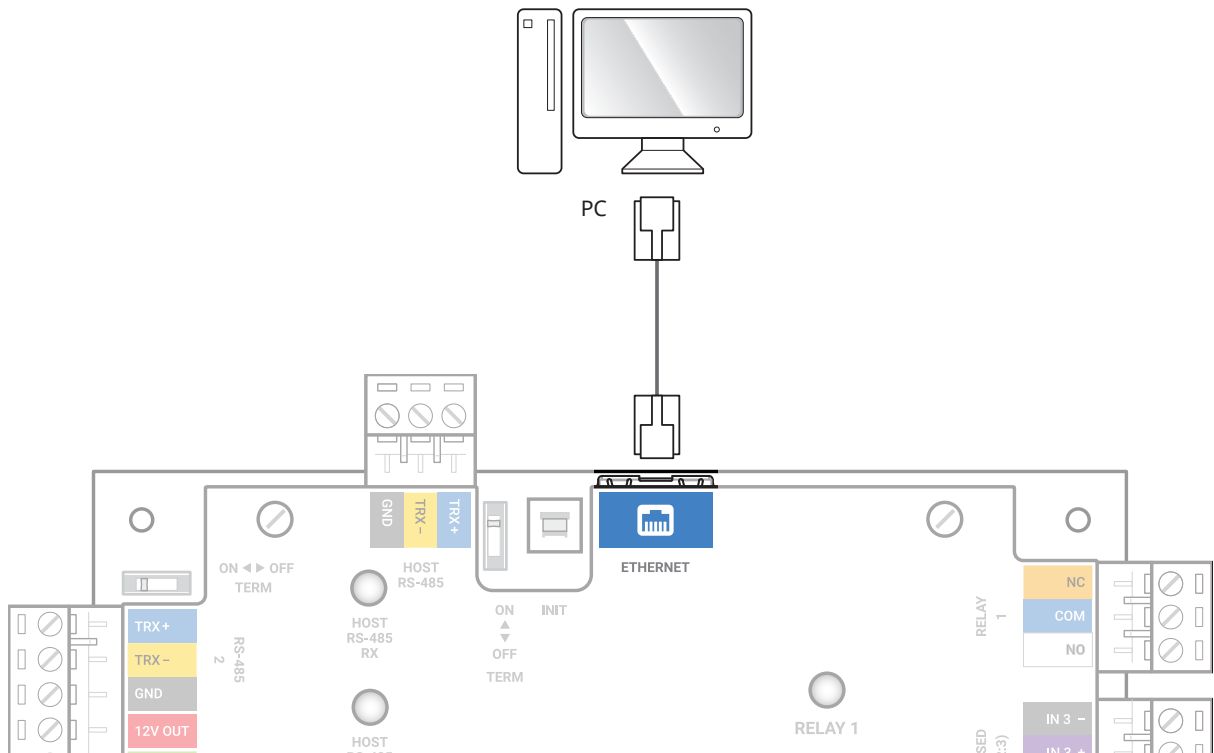
### LAN connection (connecting to a hub)

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



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

CS-40 has automatic MDI/MDI-X function, so it can be connected to a PC directly using a normal type CAT-5e cable.



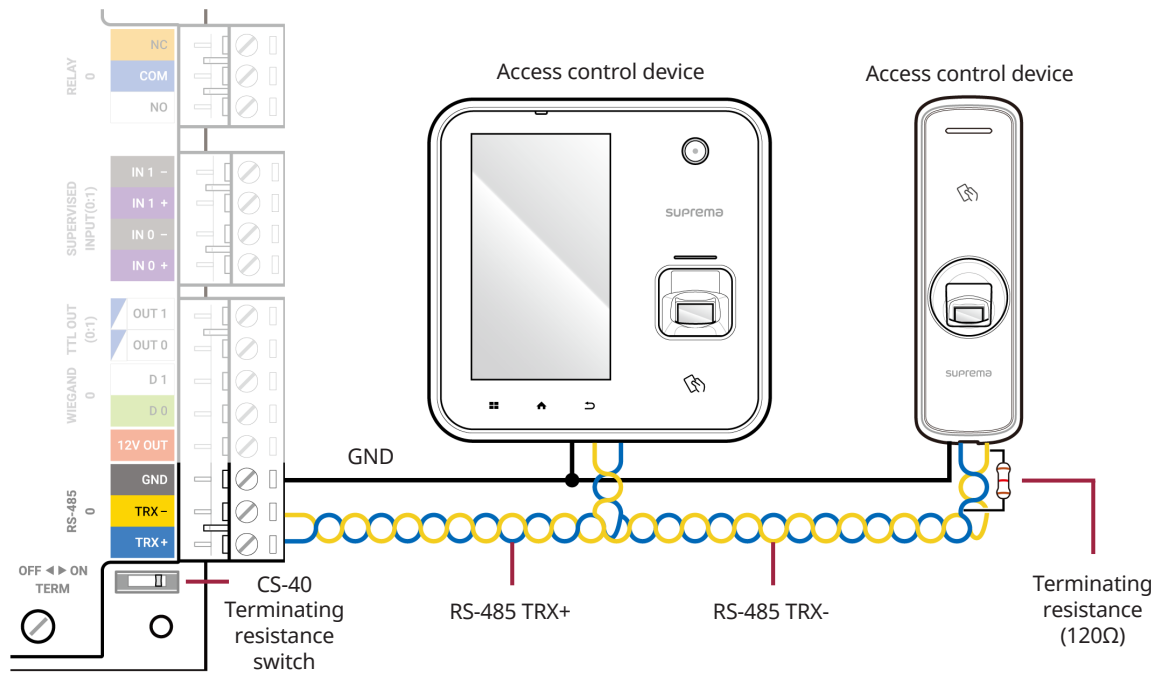


## RS-485 Connection

CS-40 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 CS-40 cannot exceed 64.
- Use an AWG24 twisted pair with a maximum length of 1.2 km for the RS-485 cable.
- Connect terminating resistance (120  $\Omega$ ) to both ends of the RS-485 daisy chain connection. If connected to the middle line, the signal level will weaken 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 CS-40.



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

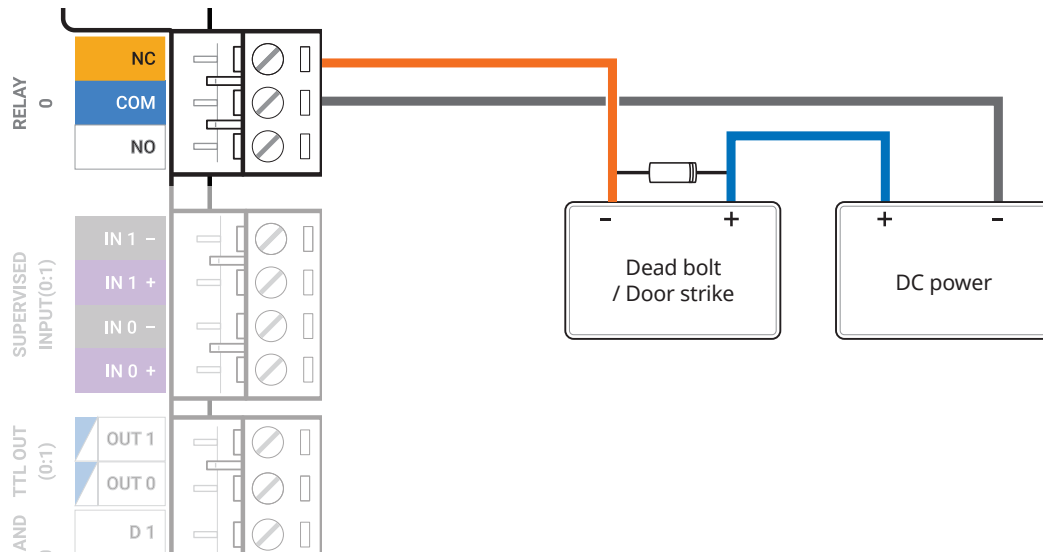
## Relay

### 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.



- 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.

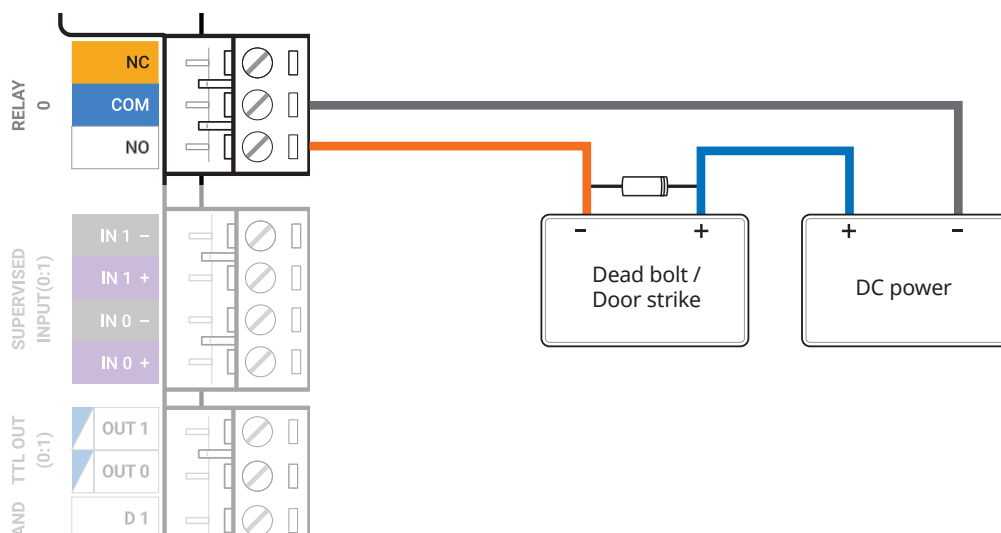


### Fail Secure Lock

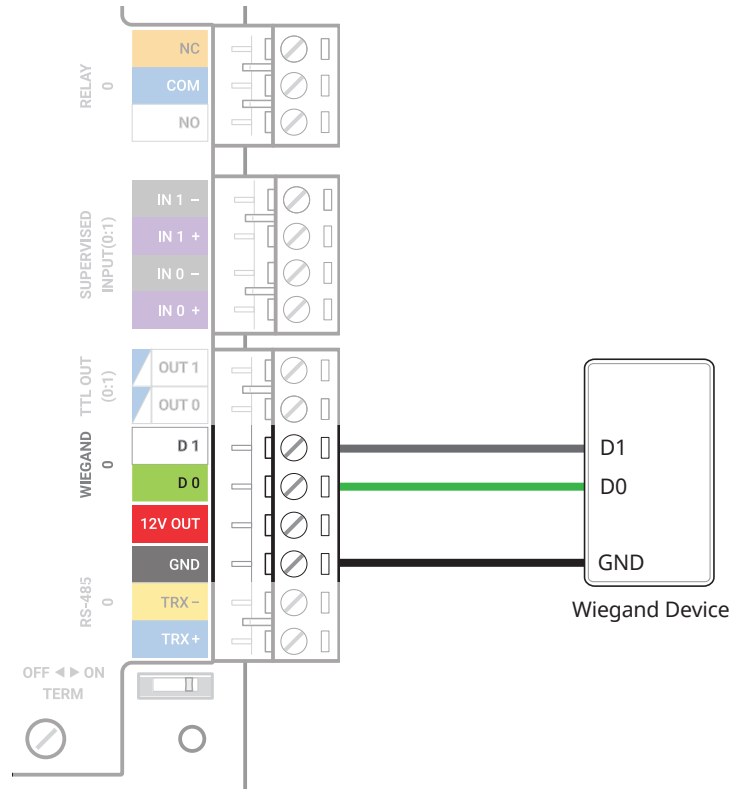
In order to use the Fail Secure Lock, connect NO relay as shown in the figure below. There is normally no current flowing through the relay for the Fail Secure Lock. When the current flow is activated by the relay, the door will open. If the power supply to the product is cut off due to a power failure or an external factor, the door will lock.



- 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 diode.

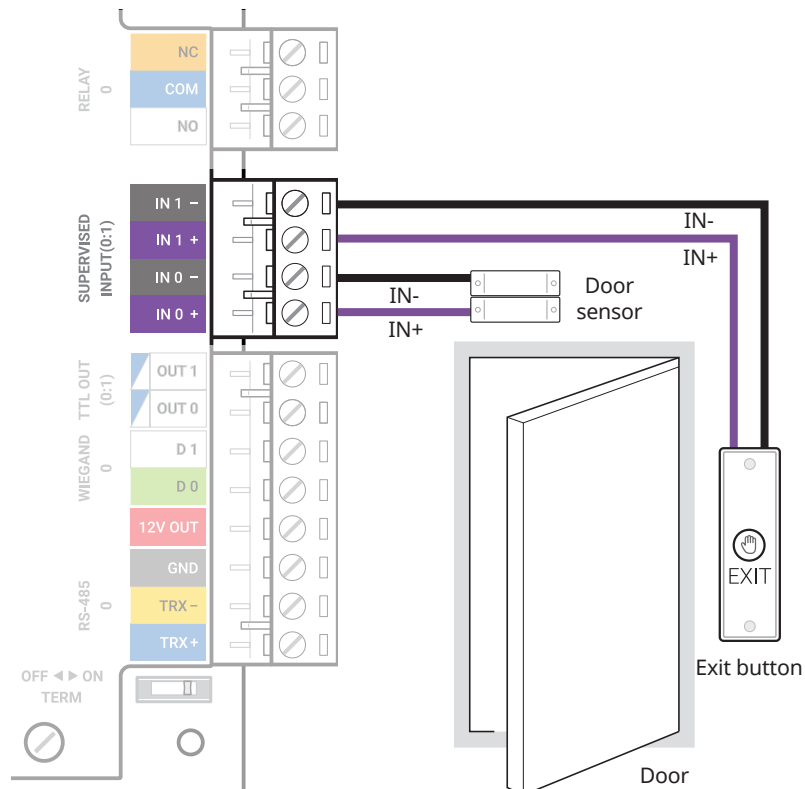


## Wiegand IN



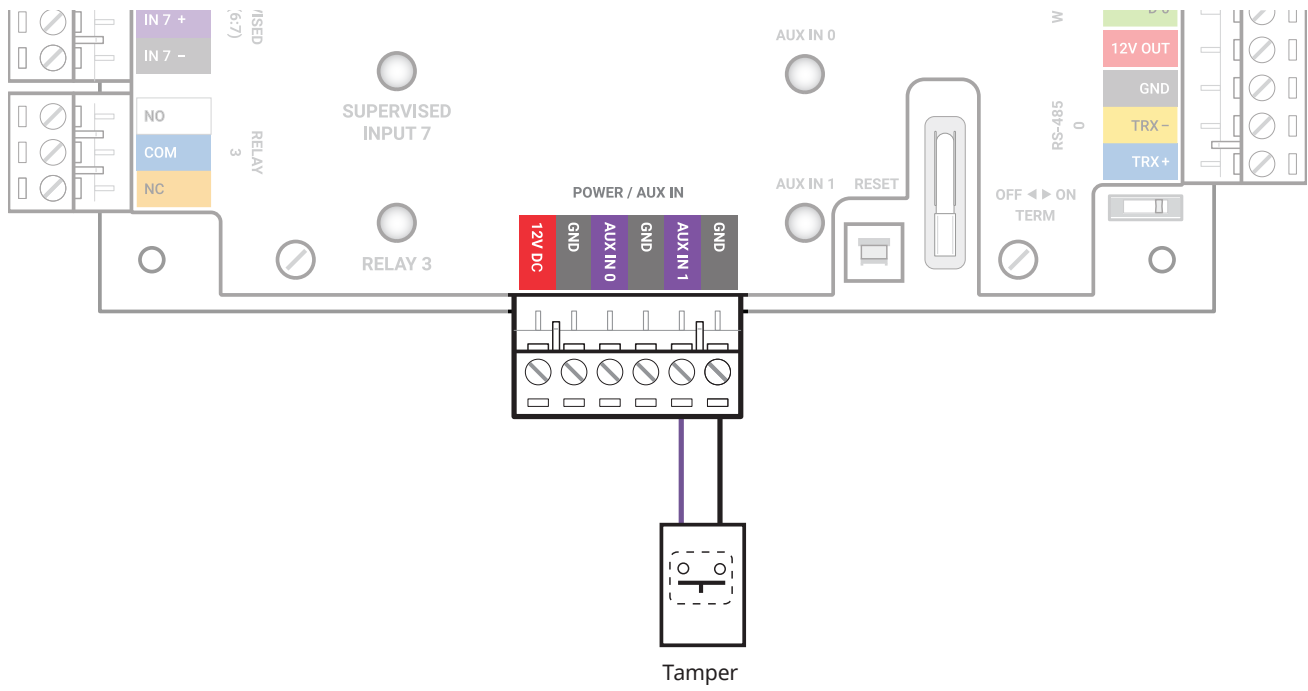
## Door sensor and Exit button

SUPERVISED INPUT terminals No. 0 ~ No. 7 can be set to be used for normal TTL input or supervised input.



## AUX IN

A power failure detector or a tamper can be connected to the AUX IN terminal.

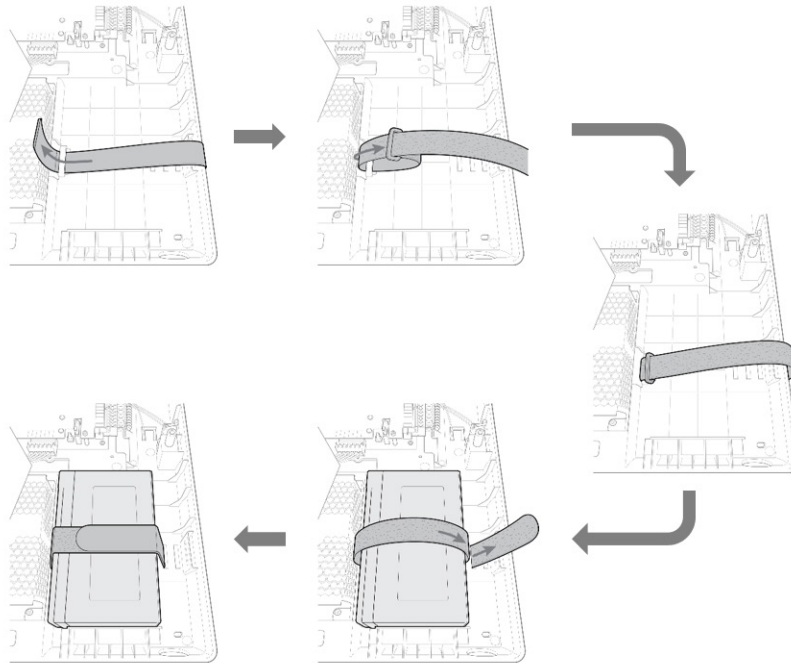


## Using the CoreStation with the enclosure

CoreStation 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

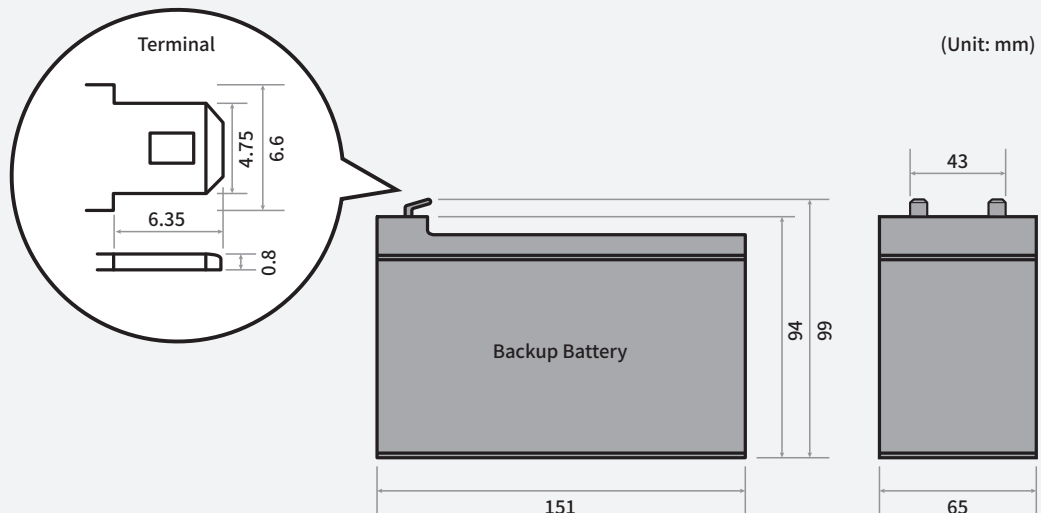
Insert the battery velcro strap into the enclosure and secure the battery.



- 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'.

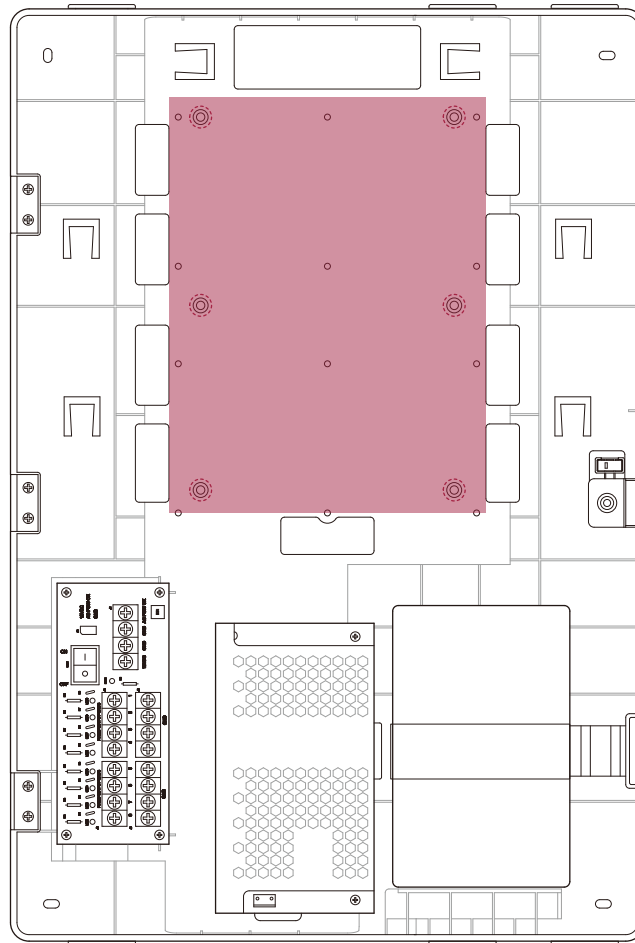


- The battery is sold separately.
- If the dimension of the backup battery is larger than the recommended specification, it may not be able to be mounted in the enclosure or the enclosure may not close after it is mounted. Also, if the shape and dimension of the terminals are different, the battery cannot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

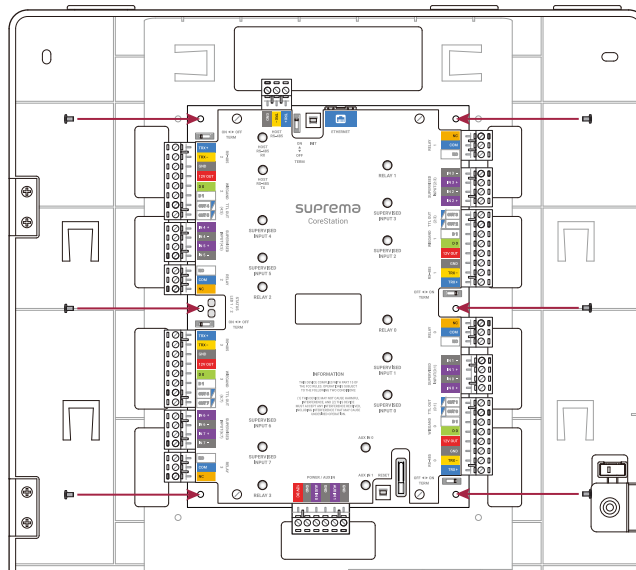


## Installing the CoreStation in the enclosure

- 1 Check the position to install the CoreStation in the enclosure.

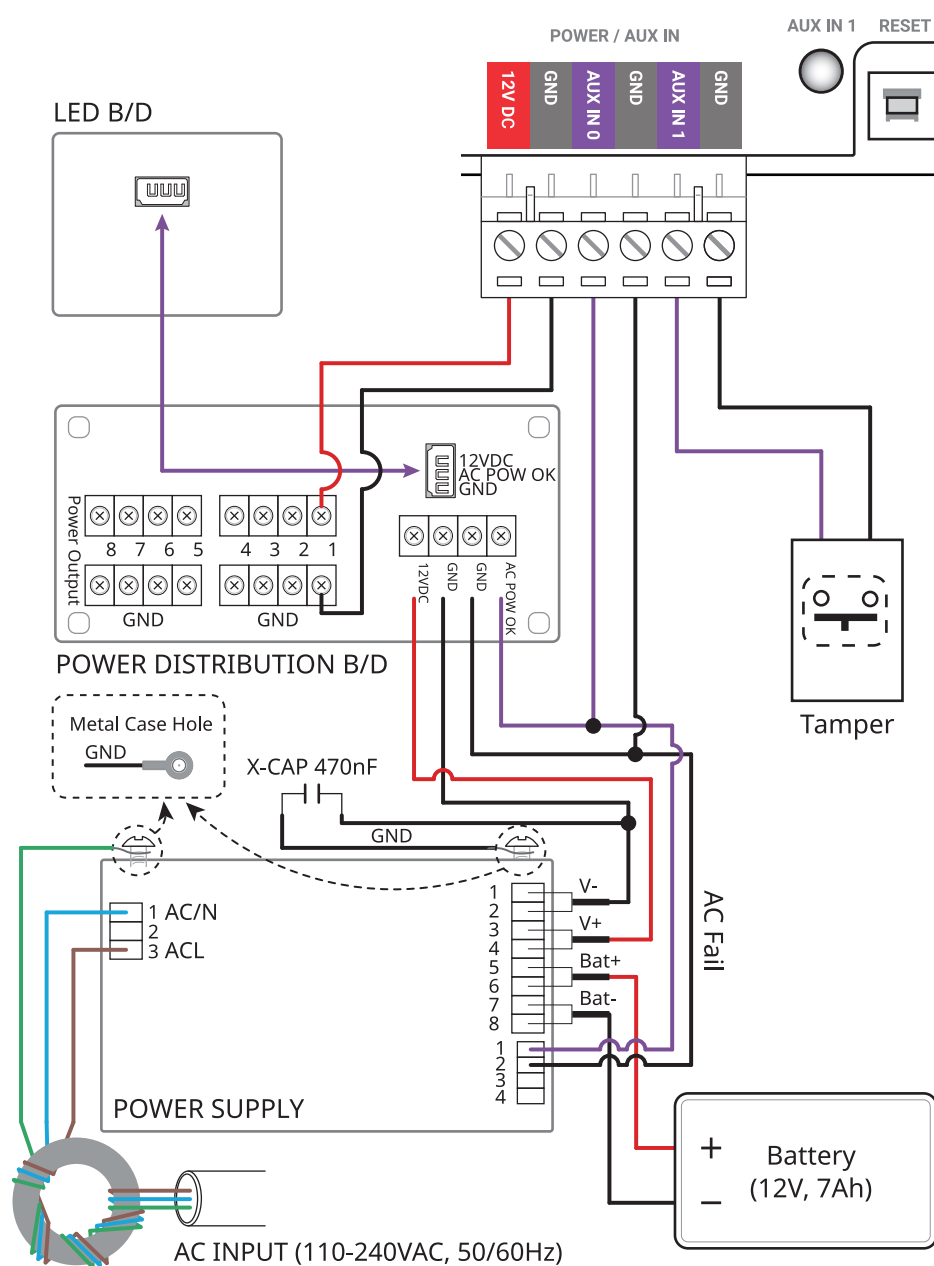


- 2 After positioning the CoreStation in the enclosure, fix it with the fixing screws.



## Power / AUX IN

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.



- Make sure to use separate power for the access control device and CS-40.
- 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 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'.

## 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**.



- You can only use **Factory Default** when the root certificate is stored on the device.
- You can view or manage the network settings of CS-40 and monitor the status of slave devices, input and output ports, and Wiegand ports by accessing the CS-40 Setup Manager.
- CS-40 Setup Manager is supported with CS-40 firmware version 1.3.1 or later. If you are using a firmware version lower than 1.3.1, upgrade the CS-40 firmware on the BioStar 2.
- For more information on CS-40 Setup Manager, refer to the user guide. To download the user guide, visit the Suprema website (<https://www.supremainc.com>).
- You can verify the current version of BioStar2 software When CS-40 is reprogrammable when connected to a network.
- For more information, contact the Suprema technical support team (<https://support.supremainc.com>).



# Product Specifications

Category	Feature	Specification
General	Model	CS-40
	CPU	1.4 GHz Octa-core
	Memory	8 GB Flash + 1 GB RAM
	Crypto Chip	Supported
	LED	Multi-color <ul style="list-style-type: none"> <li>• STATUS - 2ea</li> <li>• HOST RS-485 TX - 1ea</li> <li>• HOST RS-485 RX - 1ea</li> <li>• SUPERVISED INPUT - 8ea</li> <li>• RELAY - 4ea</li> <li>• AUX IN - 2ea</li> </ul>
	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
	Dimension (W x H x D)	150 x 214 x 21 (mm)
	Weight	415 g
	Certificates	CE, UKCA, KC, FCC, RCM, RoHS, REACH, WEEE, ETL Listed to UL 294
Capacity	Max. User	500,000 <sup>1)</sup>
	Max. Credential (1:1)	<ul style="list-style-type: none"> <li>• Fingerprint: 500,000<sup>2)</sup></li> <li>• Face: 30,000<sup>3)</sup></li> <li>• Card: 500,000</li> <li>• PIN: 500,000</li> </ul>
	Max. Credential (1:N)	<ul style="list-style-type: none"> <li>• Fingerprint: 100,000<sup>2)</sup></li> <li>• Face: 4,000<sup>3)</sup></li> </ul>
	Max. Text Log	5,000,000
Interface	Ethernet	Support (10/100 Mbps, Auto MDI/MDI-X)
	RS-485	5 ch
	RS-485 Communication Protocol	OSDP V2 compliant
	Wiegand	4 ch
	Relay	4 Relays
	TTL Input	8 ch <sup>4)</sup>
	TTL Output	8 ch
	Supervised Input	8 ch <sup>4)</sup>
AUX Input	2 ch (AC POWER FAIL, Tamper)	

Category	Feature	Specification
Electrical	Power	CoreStation <ul style="list-style-type: none"> <li>Voltage: 12 Vdc</li> <li>Current: Max. 3 A</li> </ul>
		Power Supply (SMPS) AC INPUT <ul style="list-style-type: none"> <li>110 ~ 240 VAC, 50/60 Hz</li> </ul>
	Power Output	<ul style="list-style-type: none"> <li>Voltage: 12 Vdc</li> <li>Current: Max. 1.5 A</li> </ul>
	Switch Input VIH	<ul style="list-style-type: none"> <li>Max.: 5 V</li> <li>Min.: 3 V</li> </ul>
	Switch Input VIL	Max. 1V
	Relay	5 A @ 30 VDC Resistive load

- Product specifications are subject to change without notice to improve.
- The number of users registered without any credential data.
  - If a device with a fingerprint sensor is connected as a slave, the slave device can be used for fingerprint authentication.
  - FaceStation 2 and FaceLite are available only.
  - TTL Input or Supervised Input selectable.

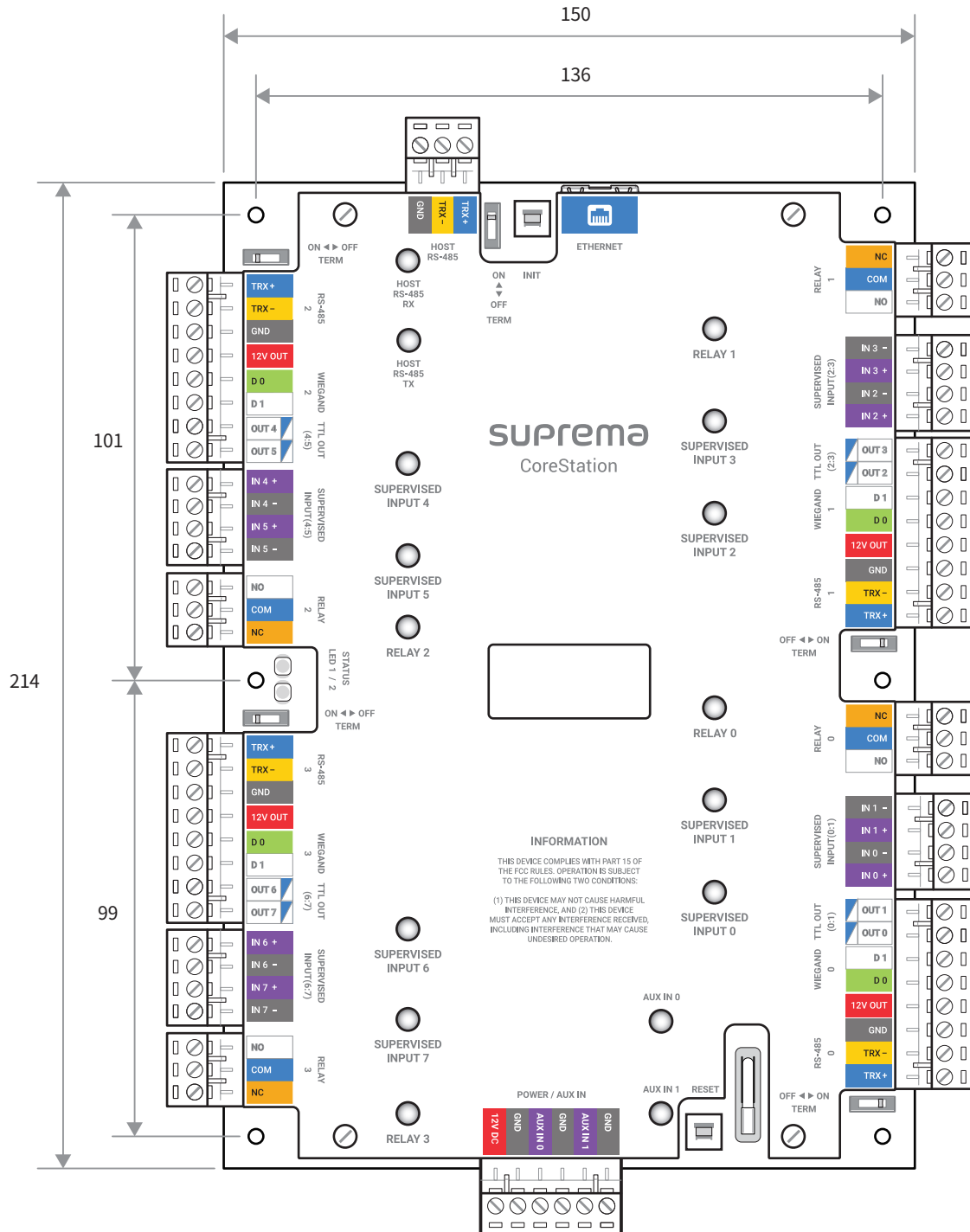


- All the supplementary equipment (card readers, keypads and fingerprint readers) should be UL294 compliant to have a UL294 compliant complete access control system.
- To have more information about CS-40 and troubleshooting section etc., please refer to the following links.  
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# Dimensions

(Unit: mm)

\* The tolerance is  $\pm 0.3$  mm.



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