

suprema
CoreStation Intelligent
Biometric Controller



suprema CoreStation Intelligent Biometric Controller Installation Guide

[Home](#) » [suprema](#) » [suprema CoreStation Intelligent Biometric Controller Installation Guide](#) 

Contents

- [1 suprema CoreStation Intelligent Biometric Controller](#)
- [2 Product Installation](#)
- [3 Operation](#)
- [4 Caution](#)
- [5 Introduction](#)
- [6 Installation](#)
- [7 Power Connection](#)
- [8 Network connection](#)
- [9 Factory Default](#)
- [10 Product Specifications](#)
- [11 Dimensions](#)
- [12 FCC](#)
- [13 Appendices](#)
- [14 FAQ](#)
- [15 Documents / Resources](#)
 - [15.1 References](#)
- [16 Related Posts](#)

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suprema CoreStation Intelligent Biometric Controller



- **Model:** CoreStation EN 101.00.CS-40 V1.10
- **Dimensions:** 26 x X x Y (units)
- **Power:** Input: XXV AC, Output: XXV DC

Product 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 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 a 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.**

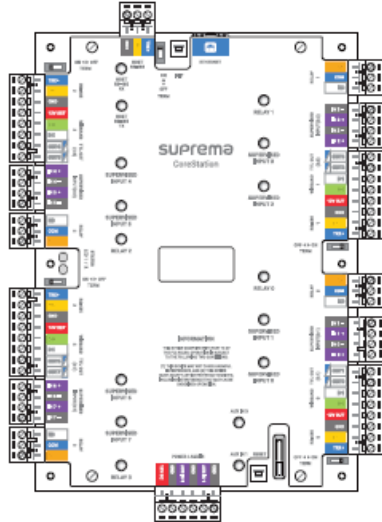





- The product may malfunction.

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.

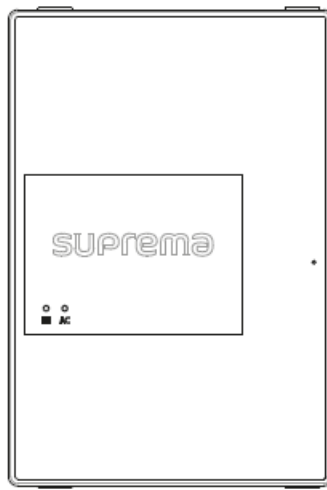
Introduction

Components

		
	Quick Guide	
		
CoreStation	Open Source Software Guide	
		
Fixing Screw x12	Spacer x6	Diode x4

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.

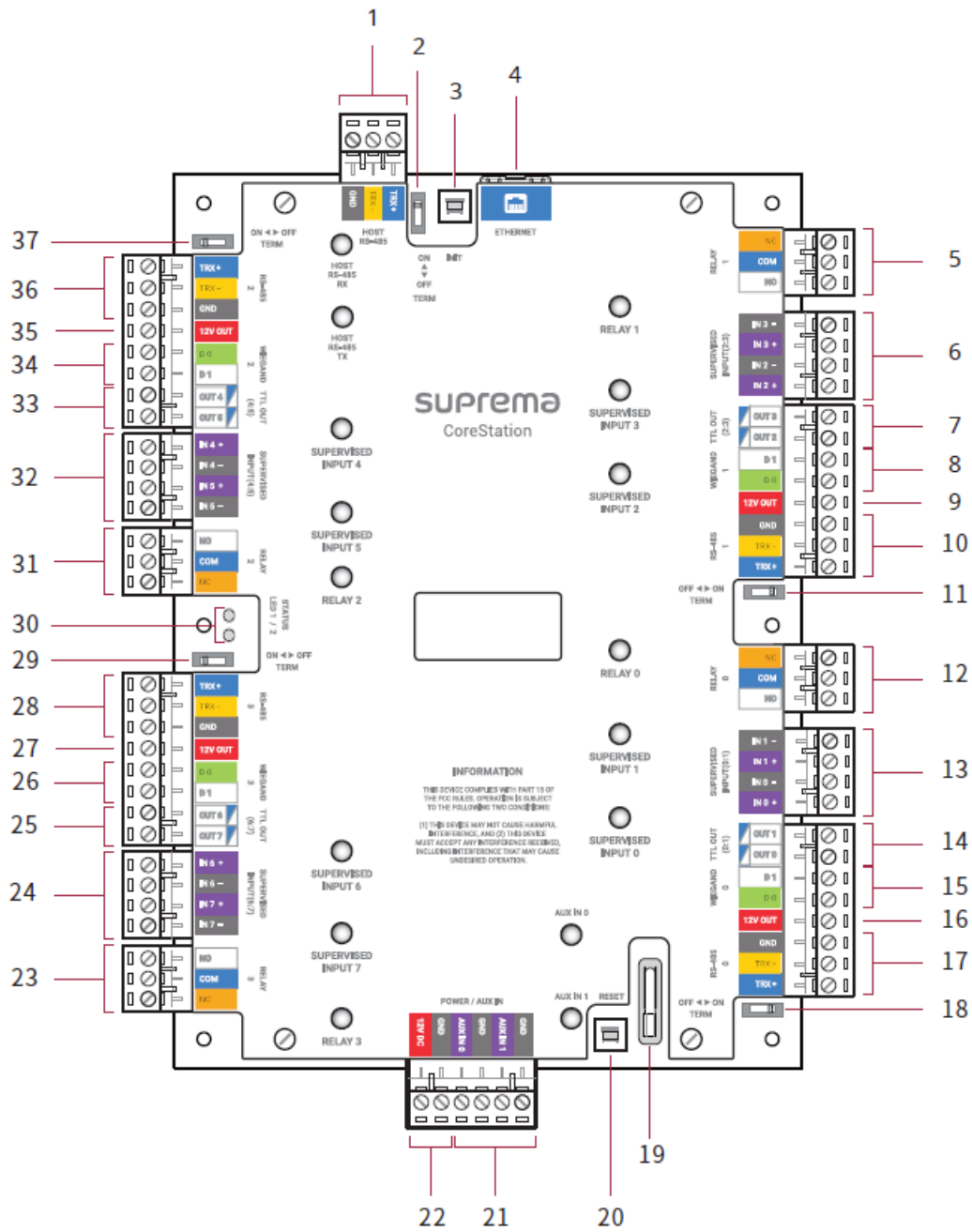


ENCR-10

INFO:

- There is no optimal height for installing ENCR-10 on the wall. Install it in 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. The life expectancy of an RTC battery may differ depending on the installation environment and how it is performed. When replacing the RTC battery, please use it 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"> Green lighting: Normal Close Off: Normal Open Supervised Input <ul style="list-style-type: none"> Green lighting: Normal Close (short circuit), Normal Open, Switch On Off: Switch Off
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 of 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 the system for 1 second each.

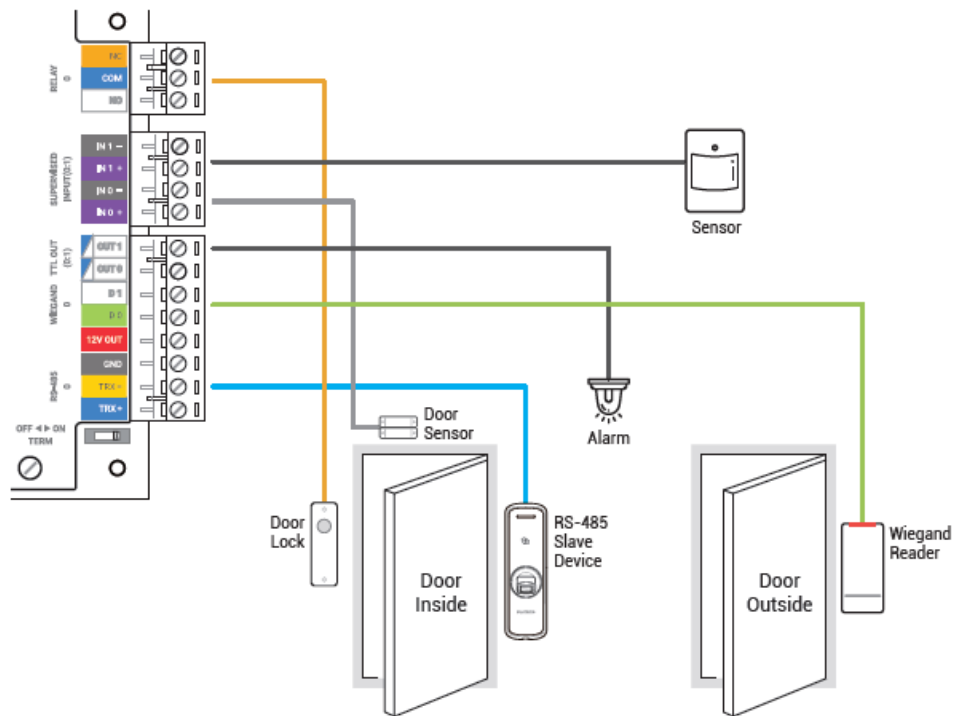
Feature	LED 1	LED 2	Status
Ethernet	Red	Red	Connection to a dynamic IP failed.
	Red	Yellow	Connection to a dynamic IP is on standby.
	Red	Sky blue	Connection to a static IP succeeded.
	Red	Blue	Connection to a dynamic IP succeeded
	Red	Magenta	Connection to a static IP failed.
	Red	Off	HW error
RS-485 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 the 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

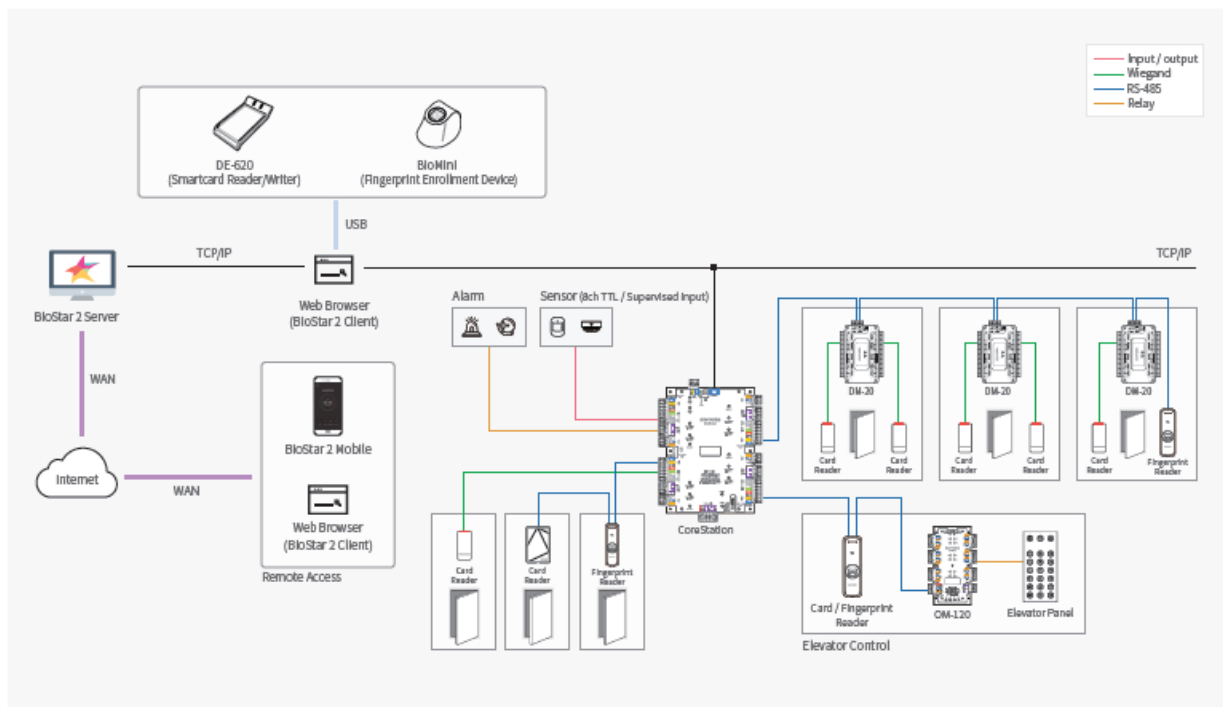
CS-40 is a centralized access control system that can perform biometric authentication. CS-40, designed as an enterprise system, can save the information of up to 500,000 users and execute matching of 400,000 fingerprints per second.

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.



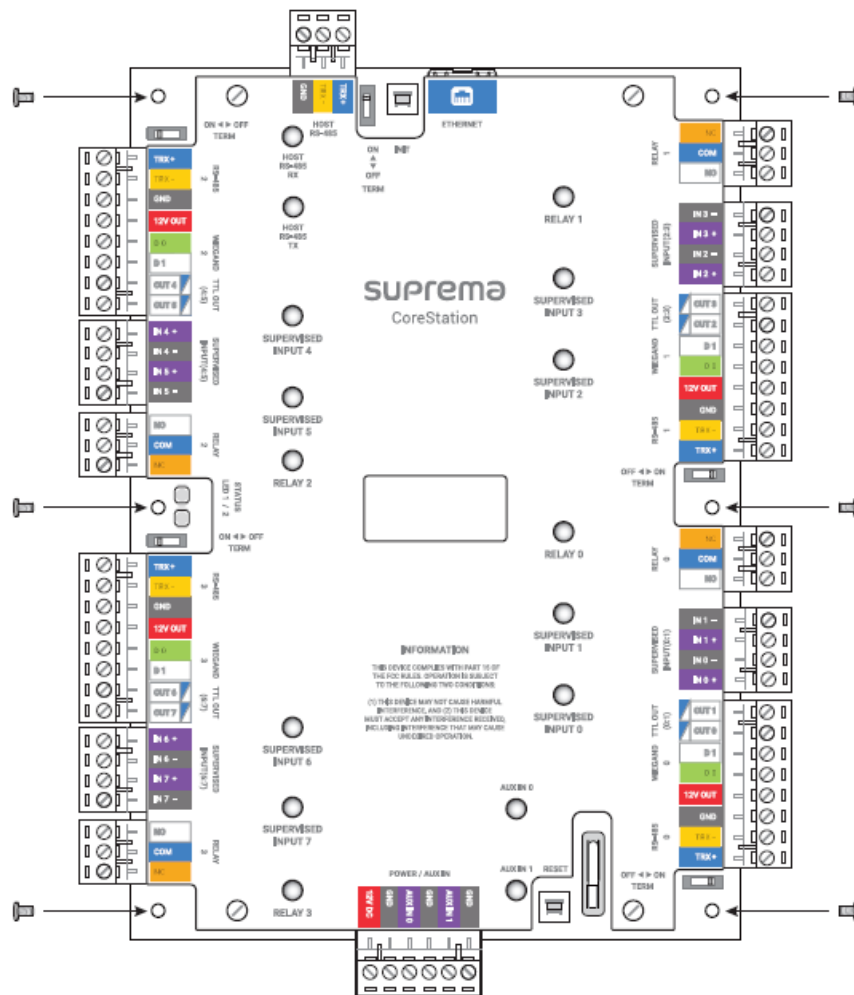
System diagram

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.

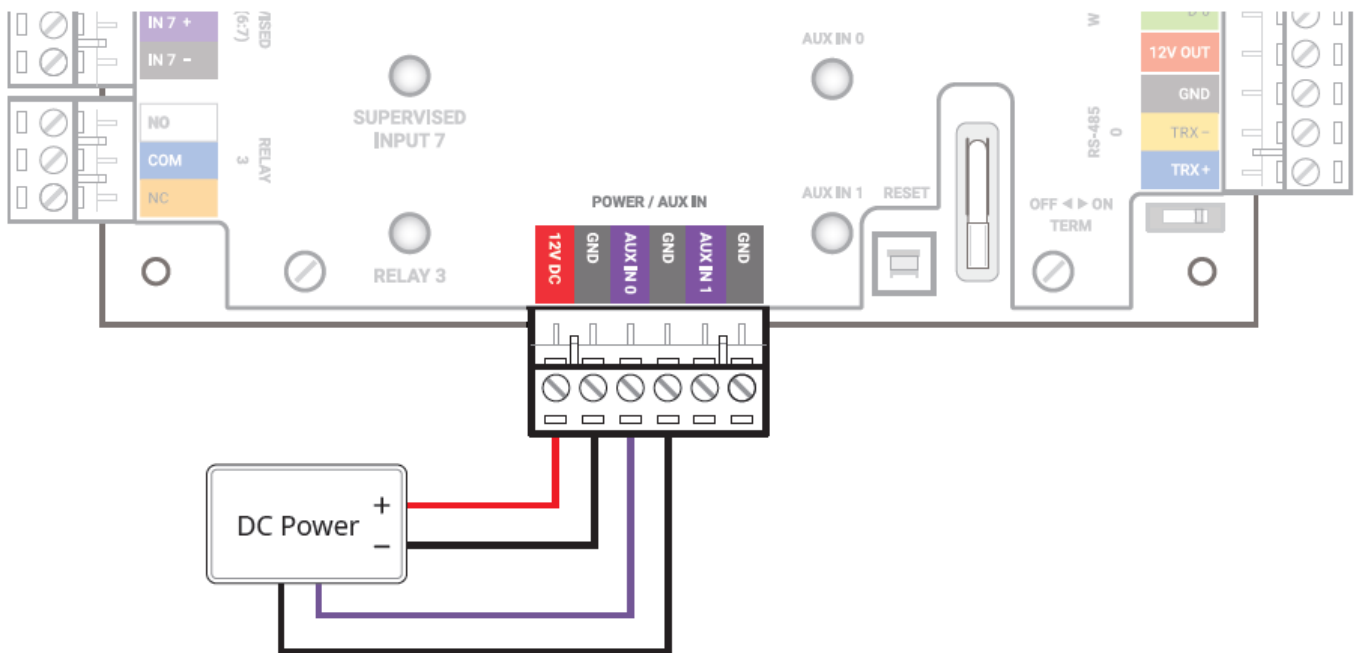


Overall Connection Diagram

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



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 that is the same or larger than the total power consumption required for the terminal and

another device.

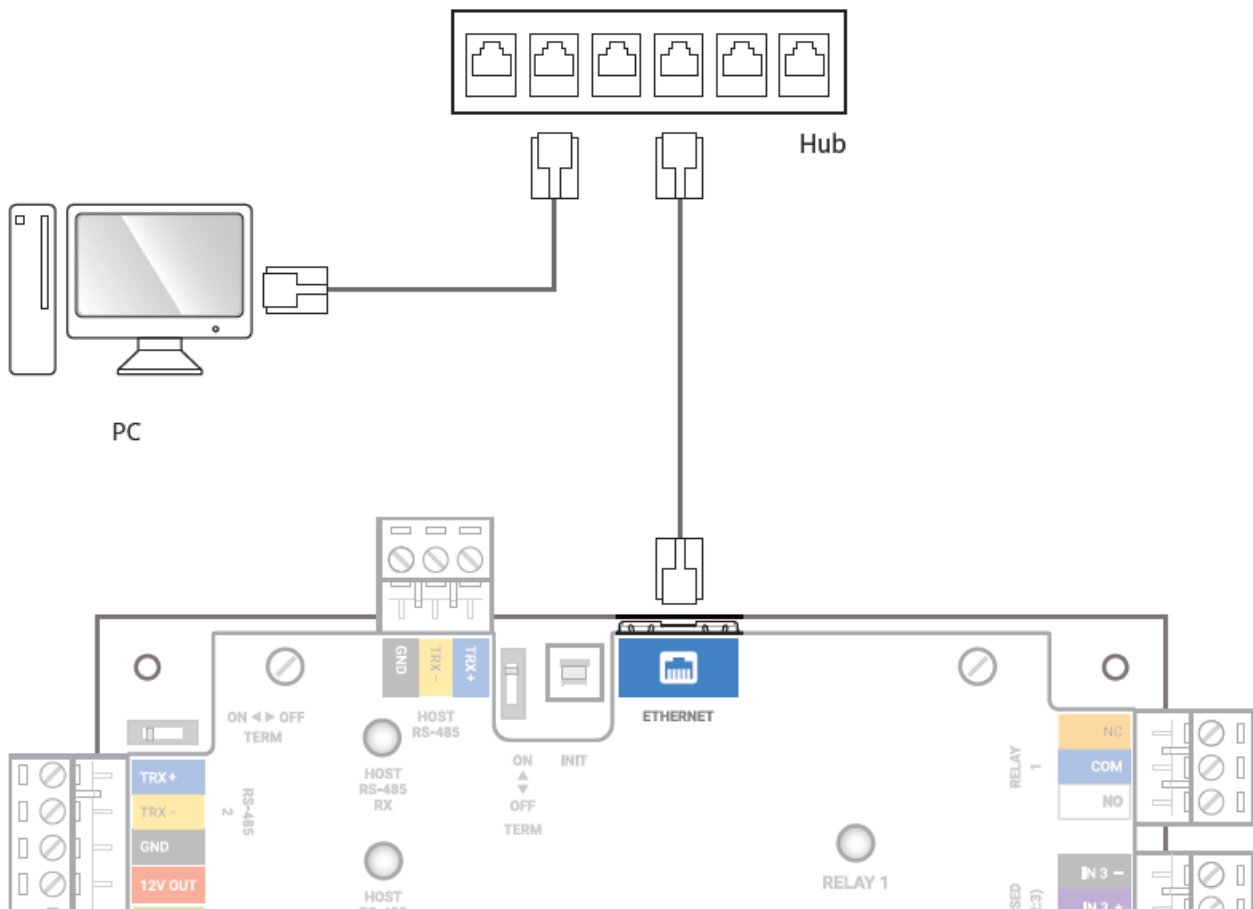
- Refer to the Power in the product specifications for maximum current consumption specifications.
- DO NOT extend the length of the power cable when using the power adapter.

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

Network connection

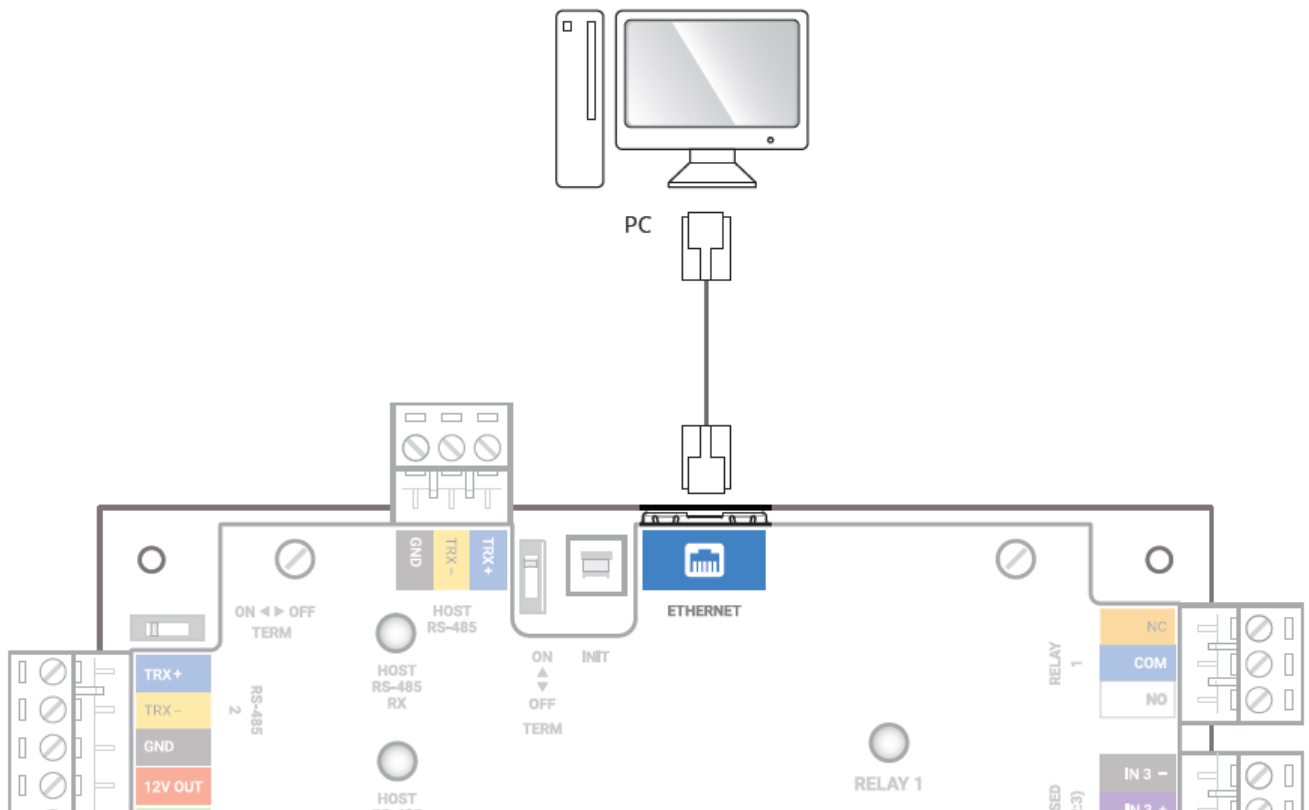
TCP/IP

- LAN connection (connecting to a hub)
- You can connect the product to a hub using a general-type CAT-5e cable.



LAN connection (connecting to a PC directly)

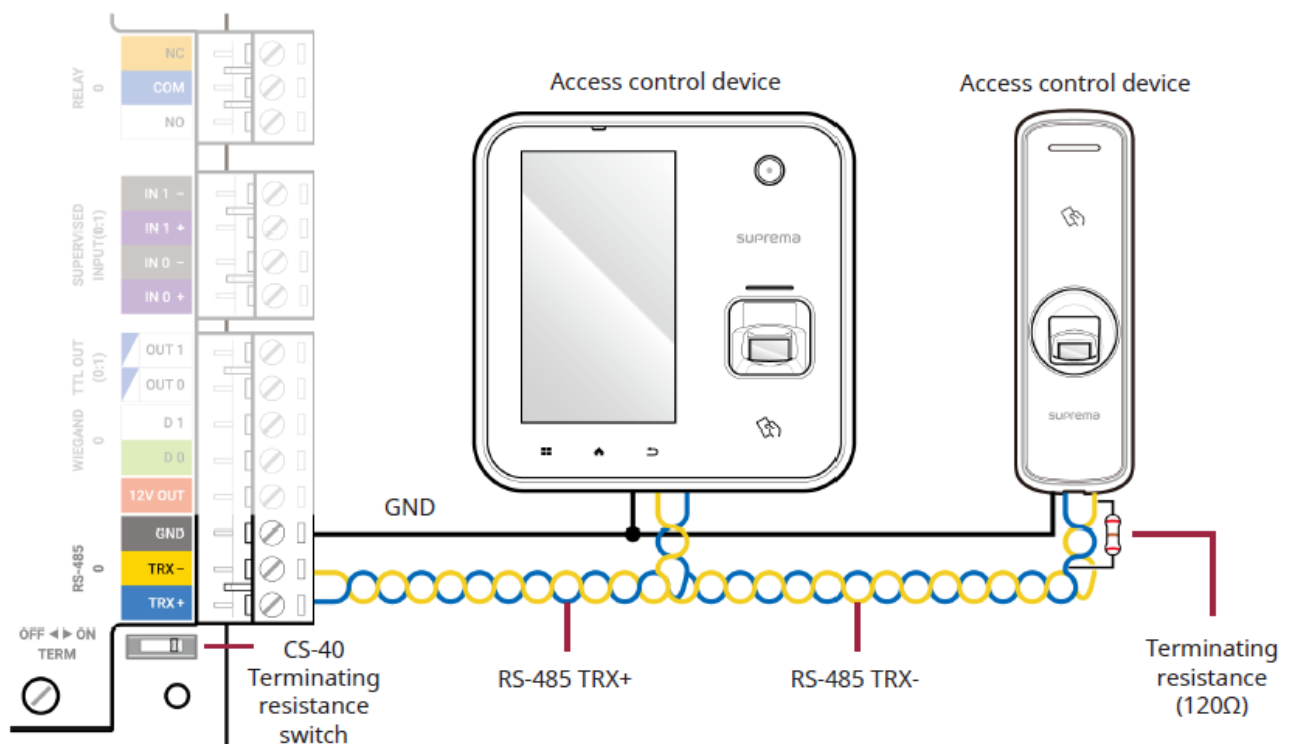
CS-40 has an automatic MDI/MDI-X function, so it can be connected to a PC directly using a normal-type CAT-5e cable.



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 Ω) 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.



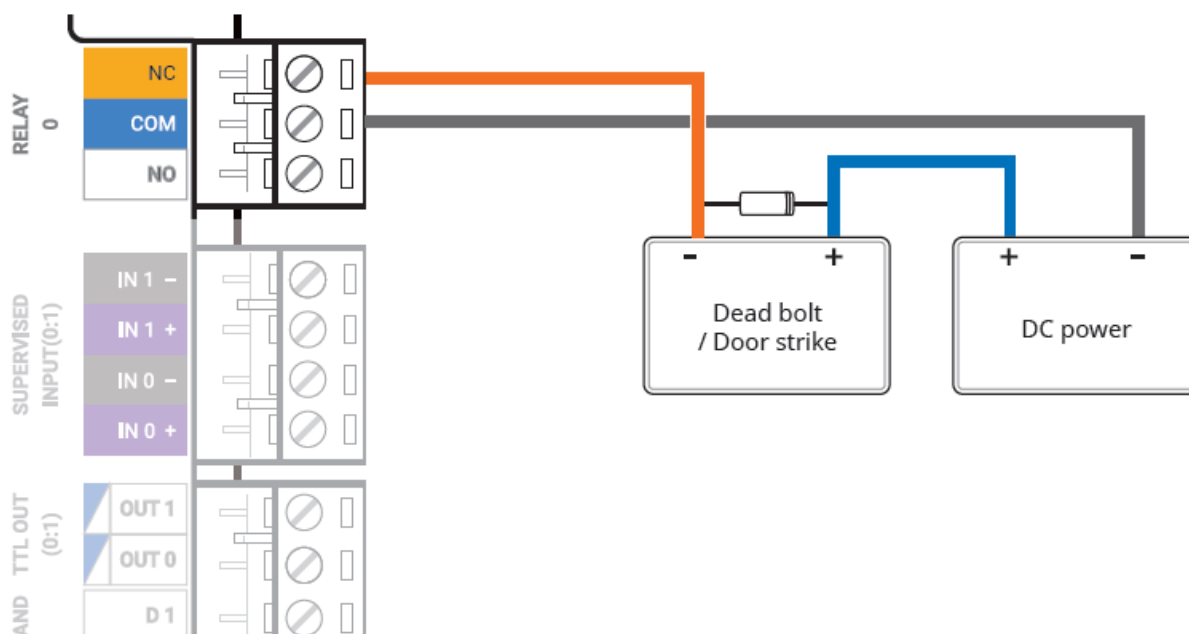
RS485 wire size shall be over 26 AWG and all wiring must comply with the National Electrical Code, ANSI/NFPA 70.

Relay

Fail Safe Lock

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.

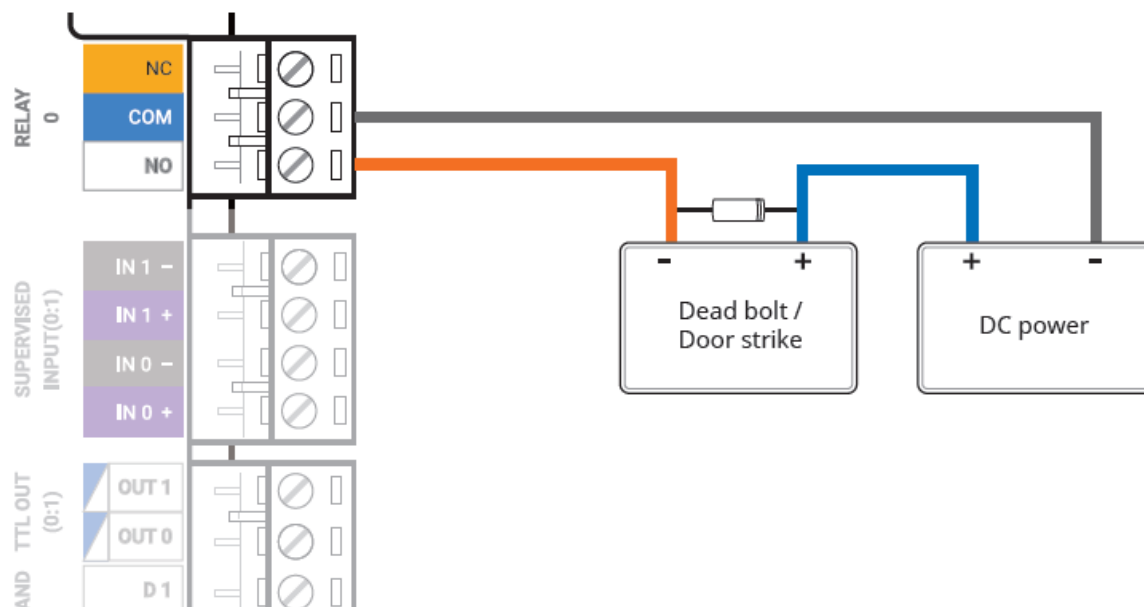
INFO: Connect a diode to both ends of the power input as shown in the figure below when installing a deadbolt or a door strike. Make sure to connect the Cathode (direction to the stripe) to the + part of the power while paying attention to the direction of the diode.



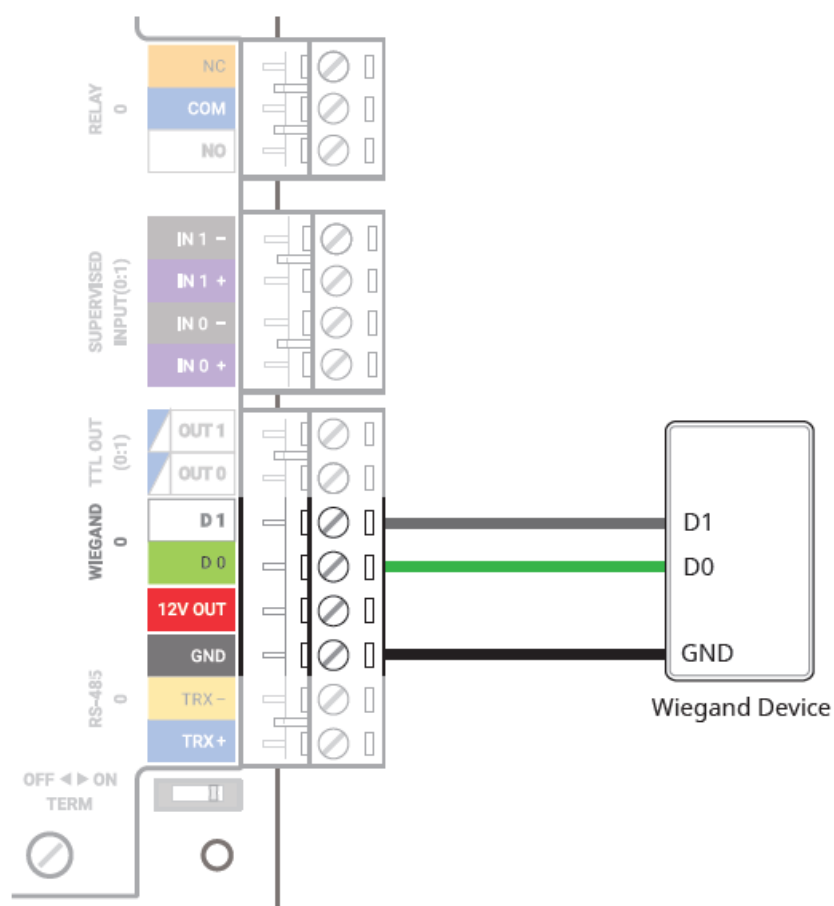
Fail Secure Lock

In order to use the Fail Secure Lock, connect the 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.

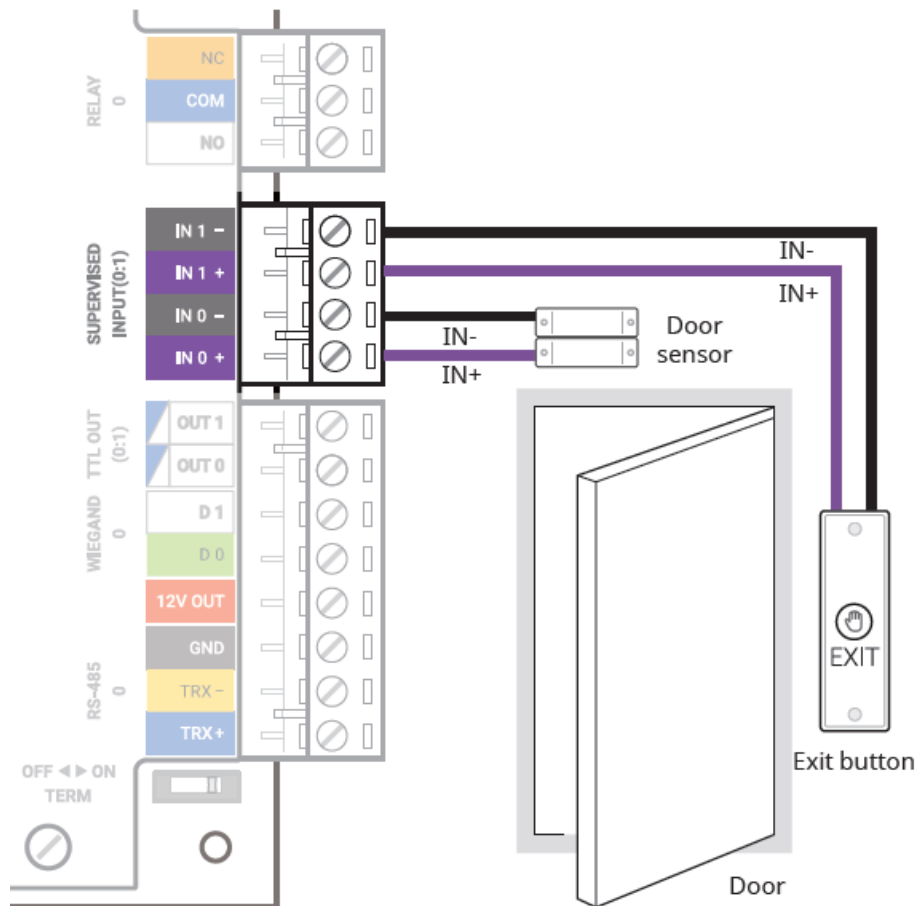


Wiegand IN



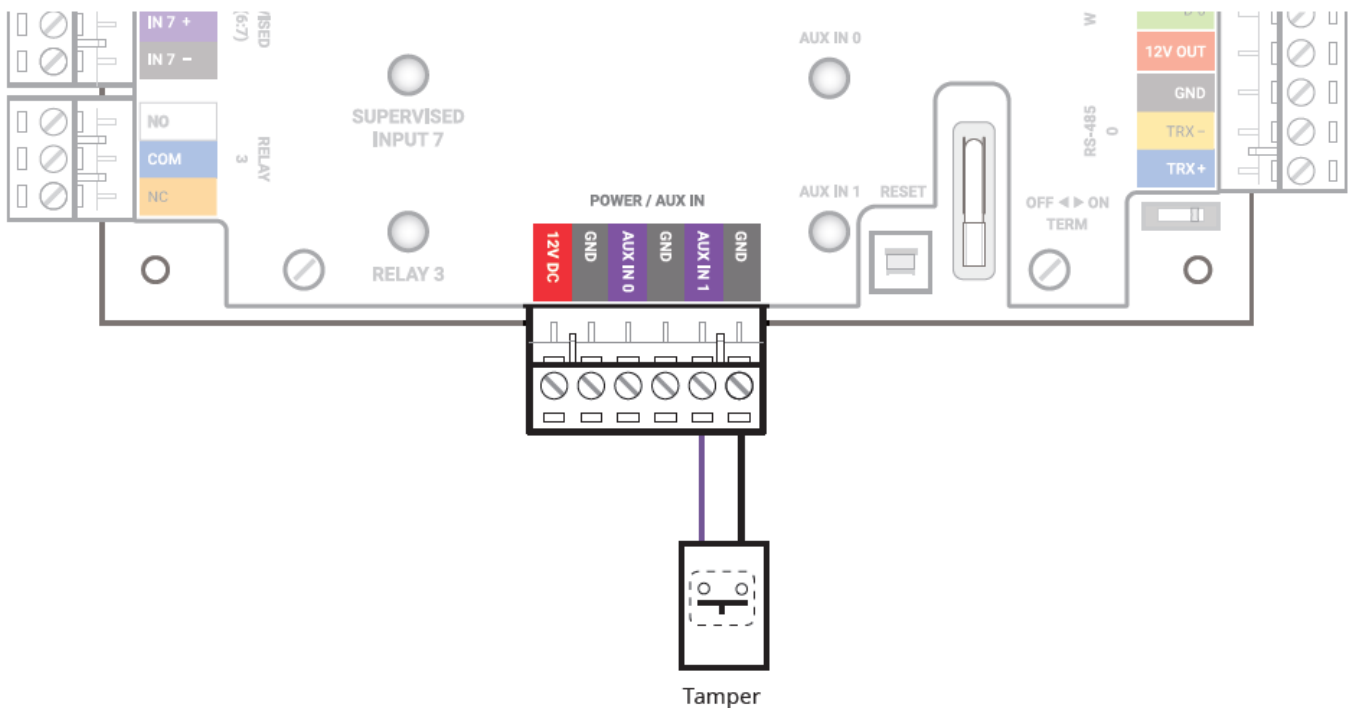
Door sensor and Exit button

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.

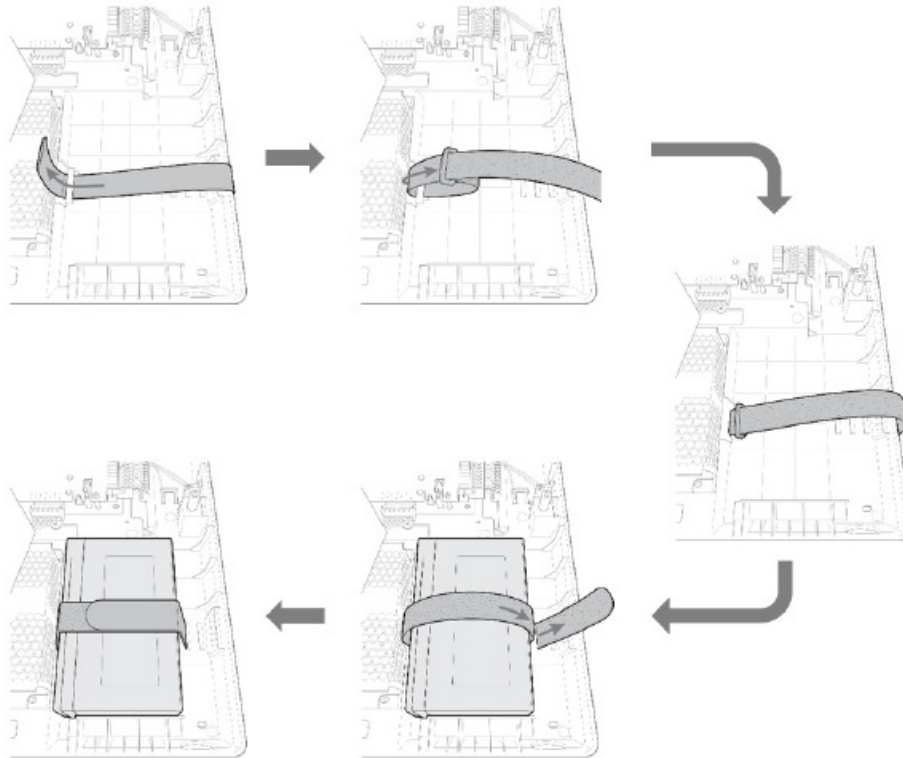


Using the CoreStation with the enclosure

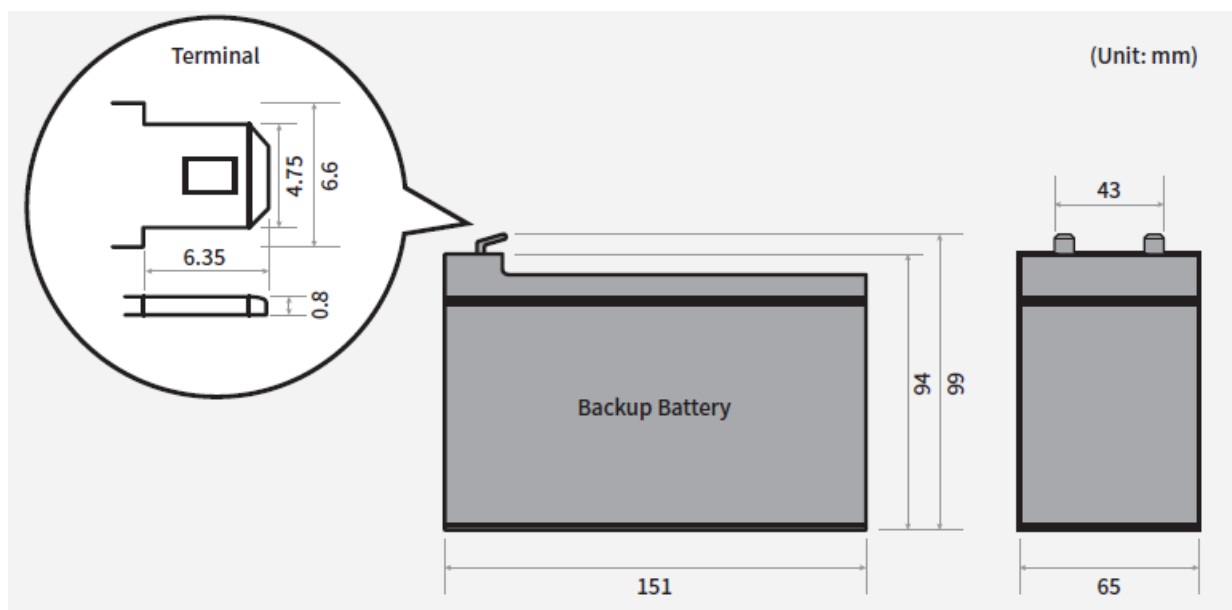
CoreStation can be installed inside the enclosure (ENCR-10) for physical and electrical protection. The enclosure includes a power status LED board, power distribution board, power supply, and tamper. The enclosure is sold separately.

Securing the battery

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

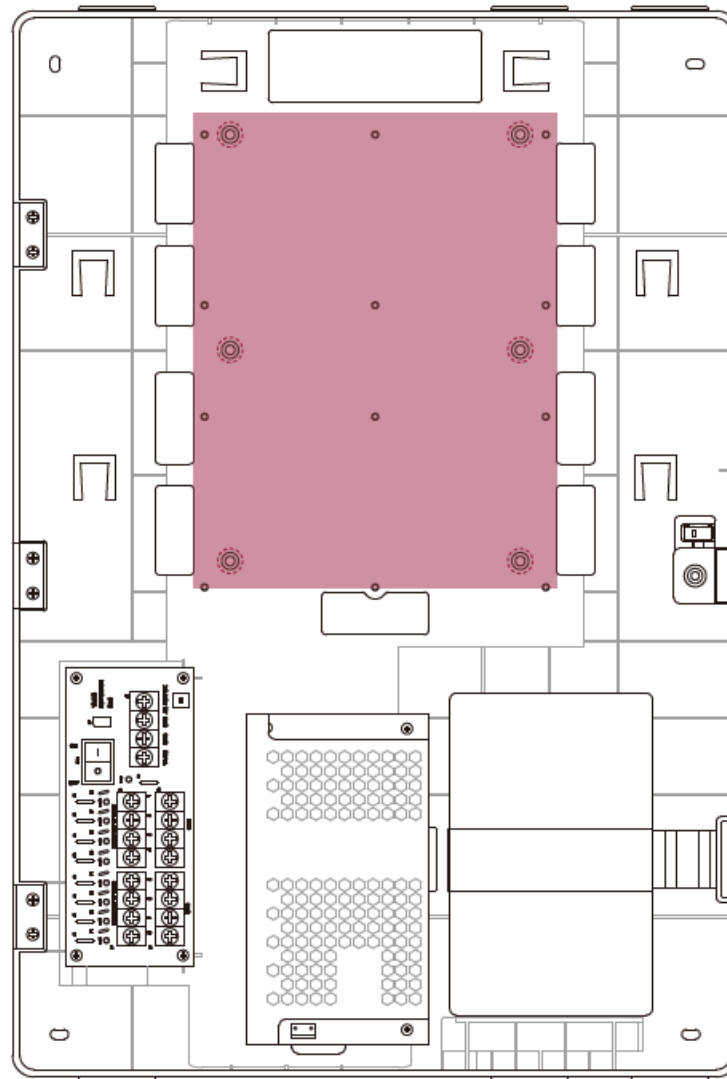


- Use a backup battery with 12 VDC and 7 Ah or higher. This product was tested with 'EES7-12battery of 'ROCKET'. It is recommended to use a battery corresponding to 'ES7-12'.
- The battery is sold separately.
- If the dimension of the backup battery is larger than the recommended specification, it may 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.

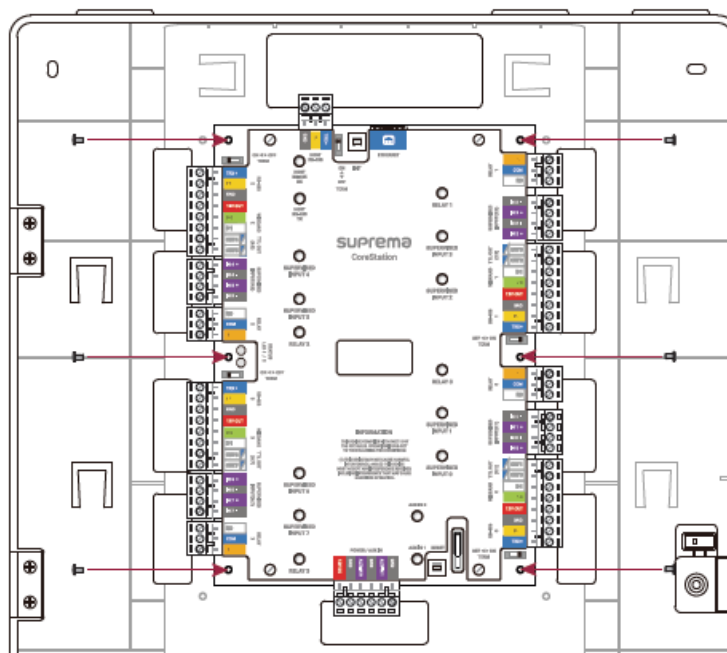


Installing the CoreStation in the enclosure

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

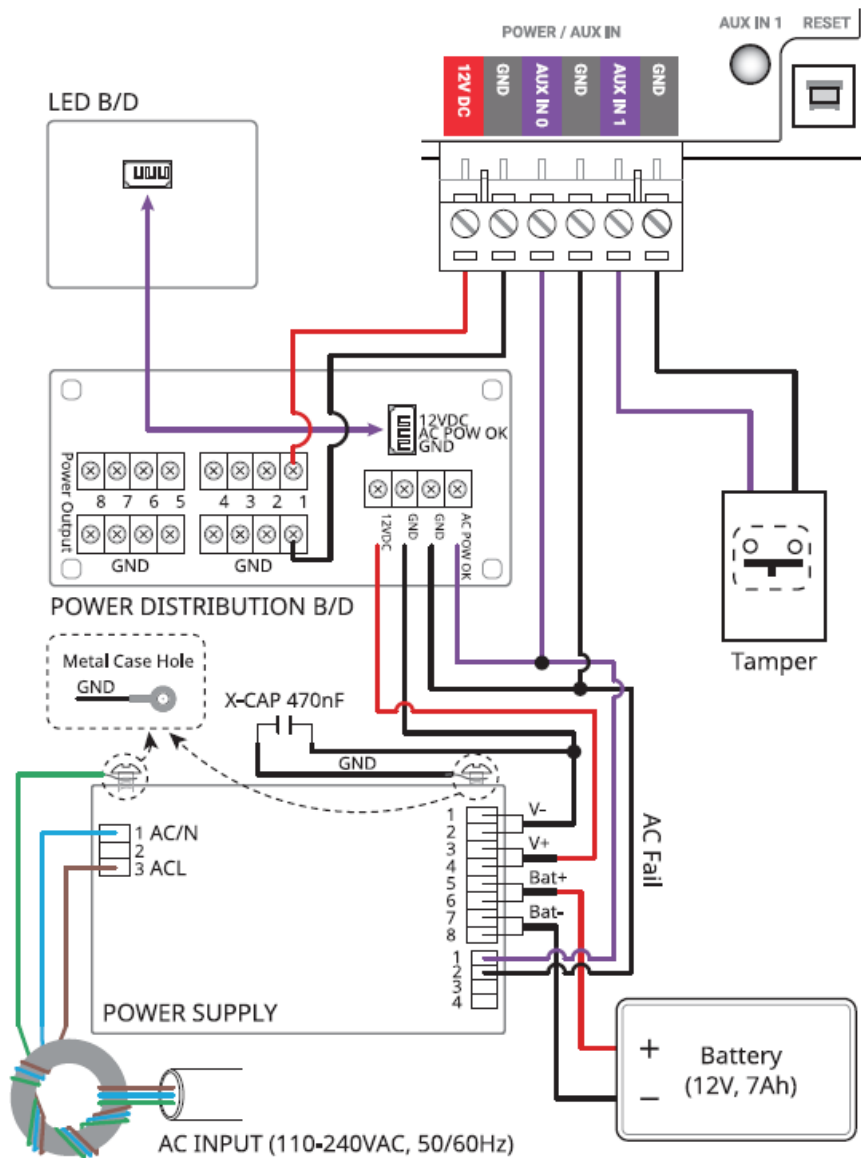


2. After positioning the CoreStation in the enclosure, fix it with the fixing screws.



Power / AUX IN

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



INFO:

- 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 that 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 the 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.

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 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">• 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
	Dimension (W x H x D)	150 x 214 x 21 (mm)
	Weight	415 g
	Certificates	CE, UKCA, KC, FCC, RCM, RoHS, REACH, WEEE
	Max. User	500,0001)

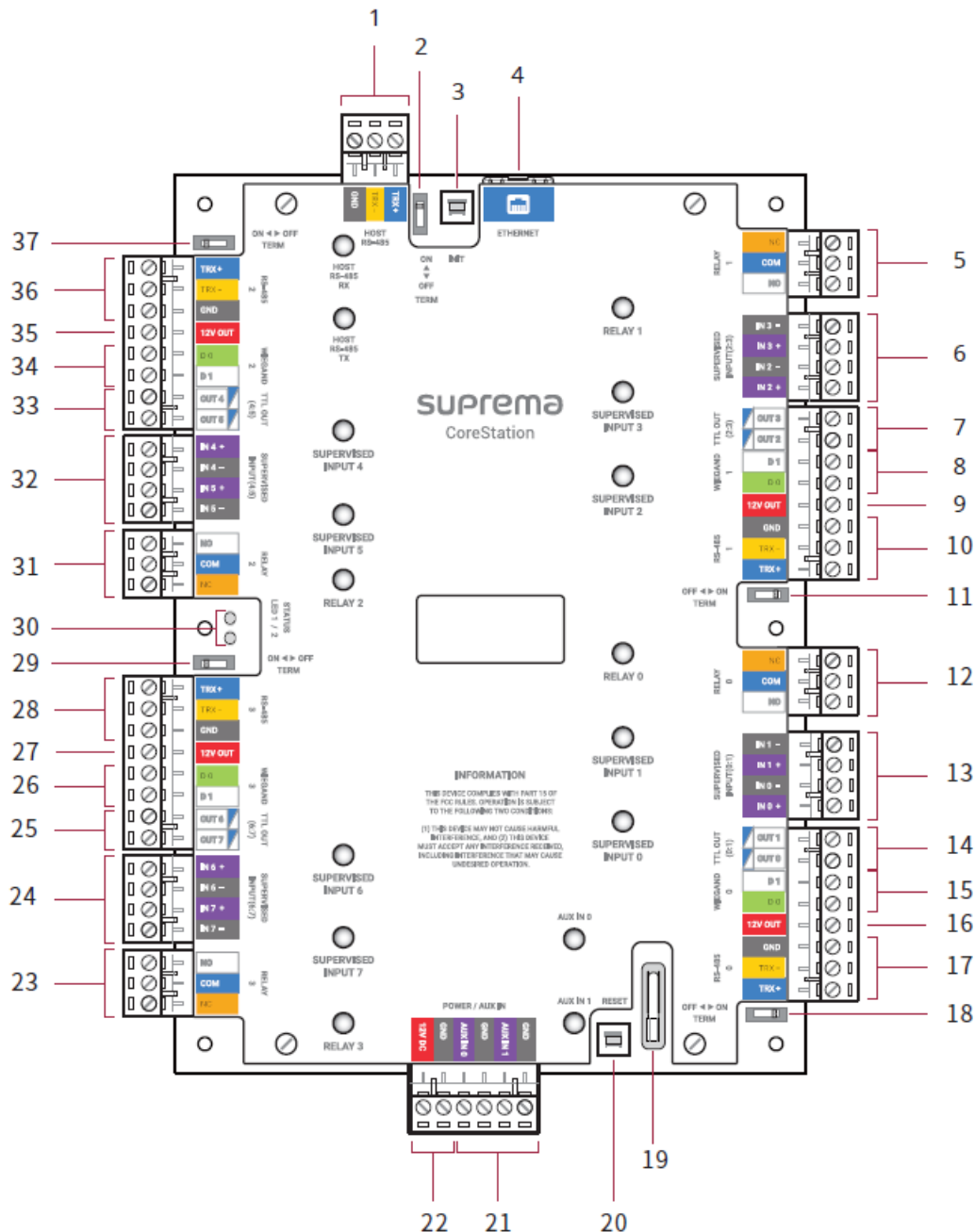
Capacity	Max. Credential (1:1)	<ul style="list-style-type: none"> Fingerprint: 500,000²⁾ Face: 30,000³⁾ Card: 500,000 PIN: 500,000
	Max. Credential (1:N)	<ul style="list-style-type: none"> Fingerprint: 100,000²⁾ Face: 4,000³⁾
	Max. Text Log	5,000,000
Interface	Ethernet	Support (10/100 Mbps, Auto MDI/MDI-X)
	RS-485	5 ch
	RS-485 Communication Protocol	OSDP V2 compliant
	Wiegand	4 ch
	Relay	4 relays
	TTL Input	8 ch ⁴⁾
	TTL Output	8 ch
	Supervised Input	8 ch ⁴⁾
	AUX Input	2 ch (AC POWER FAIL, Tamper)

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

Product specifications are subject to change without notice to improve.

1. The number of users registered without any credential data.
 2. If a device with a fingerprint sensor is connected as a slave, the slave device can be used for fingerprint authentication.
 3. FaceStation 2 and FaceLite are available only.
 4. TTL Input or Supervised Input selectable.
- To have more information about CS-40 and the troubleshooting section etc., please refer to the following links. http://kb.supremainc.com/knowledge/doku.php?id=en:14_subjects_of_corestation_faq

Dimensions



FCC

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.
 1. This equipment has been tested and found to comply with the limits for a Class A digital device, under 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 by 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.
 2. 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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- This product uses the “glibc” library, which is licensed under LGPL. As for LGPL, please refer to the GNU Lesser General Public License in this manual.
- This product uses the “QT” library, which is licensed under LGPL. As for LGPL, please refer to the GNU Lesser General Public License in this manual.
- This product uses the “OpenSSL”, which is licensed under the OpenSSL and Original SSLeay licenses. As for the OpenSSL and Original SSLeay licenses, please refer to the OpenSSL License and Original SSLeay License in this manual.
- To request the modified source code based on Linux Kernel 3. x and the source code of glibc and QT libraries, which are included in this product, please contact us at support.supremainc.com.

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Version 3, 29 June 2007

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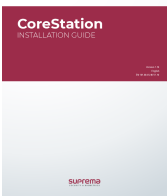
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FAQ

- **Q: Can I install the CoreStation outdoors?**
 - **A:** It is recommended to install the CoreStation indoors in a dry location away from direct sunlight and extreme weather conditions.
- **Q: What should I do if the product is exposed to radio frequencies?**
 - **A:** Move the CoreStation to a location where it is not affected by radio frequencies to ensure proper functionality.

Documents / Resources

	suprema CoreStation Intelligent Biometric Controller [pdf] Installation Guide EN 101.00.CS-40 V1.10, CoreStation Intelligent Biometric Controller, CoreStation, Intelligent Biometric Controller, Biometric Controller
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References

-  [Front Page — Free Software Foundation — working together for free software](#)
-  [14 Subjects of CoreStation FAQ \[\]](#)

-  openssl.org/
-  [Technical Support | Suprema](#)
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