CoreStation 20

INSTALLATION GUIDE

Version 1.02

English
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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.

Do not connect the power supply and PoE+ power together.

- Devices may malfunction.

When connecting PoE+ power, make sure to connect it according to PoE+ or PoE++ standards.

- Using standard PoE may cause devices to operate unstably or be permanently damaged.

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.

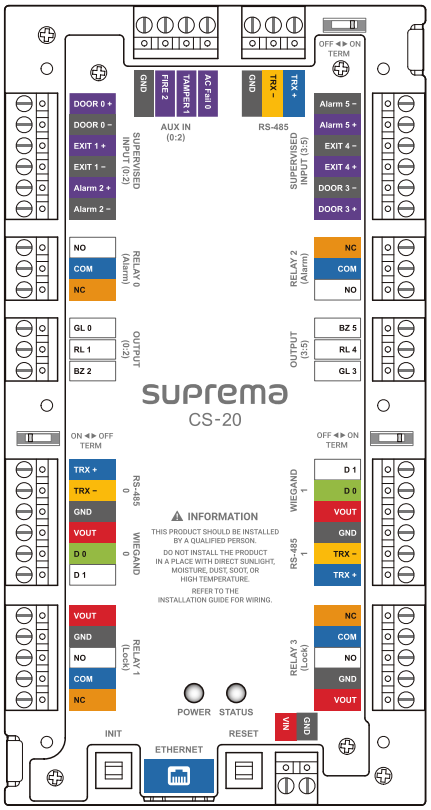
Do not use the product for purposes other than its intended use.

- The device may malfunction.

Getting Started

Provides initial procedures for getting started with the device.

Components



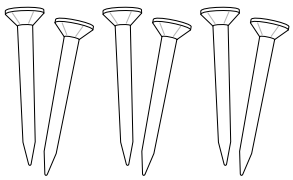
CoreStation 20



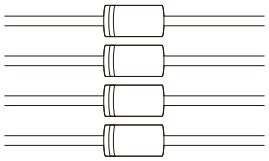
Quick Guide



Open Source Software Guide



Fixing Screw x6

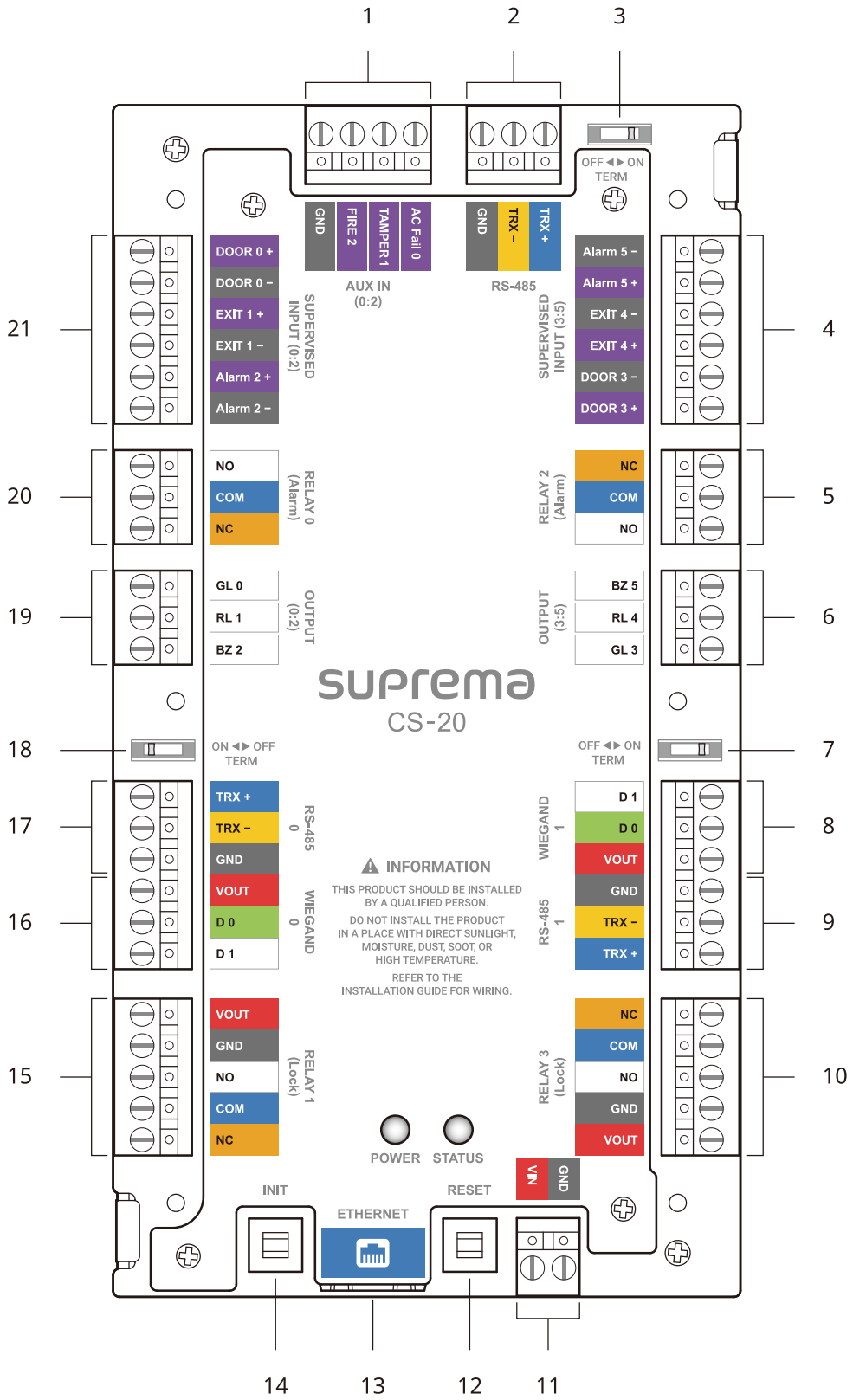


Diode x4

Info

- Components may vary according to the installation environment.

Name and function of each part



No.	Name
1	**AUX IN (0:2)** connection
2	**RS-485** connection
3	**RS-485** termination resistor switch
4	**SUPERVISED INPUT (3:5)** or **Input (3:5)** connection
5	**RELAY 2 (Alarm)** connection
6	**OUTPUT (3:5)** connection
7	**RS-485 1** termination resistor switch
8	**WIEGAND 1** connection
9	**RS-485 1** connection
10	**RELAY 3 (Lock)** connection
11	CoreStation 20 power connection (DC 12V / DC 24V IN)
12	**RESET** button
13	**ETHERNET** connection
14	**INIT** button
15	**RELAY 1 (Lock)** connection
16	**WIEGAND 0** connection
17	**RS-485 0** connection
18	**RS-485 0** termination resistor switch
19	**OUTPUT (0:2)** connection
20	**RELAY 0 (Alarm)** connection
21	**SUPERVISED INPUT (0:2)** or **Input (0:2)** connection

Info

- Press the **RESET** button to reboot the product.
- Press the **INIT** button to initialize the network settings or delete all data and certificates stored on the device. For more information, refer to Initialize network settings or Factory Default.
- You can use the product's reader power output (12 Vdc, up to 0.6 A / 24 Vdc, up to 0.3 A) as the power for the Wiegand device when connecting the product to the Wiegand device. You can connect two Wiegand devices consuming 0.3 A based on 12 Vdc power output.

CoreStation 20 status LED

The product's status can be checked at the STATUS located on the right side of the front of the product, displaying the status of Ethernet, RS-485, RS-485 0, RS-485 1, in order every second.

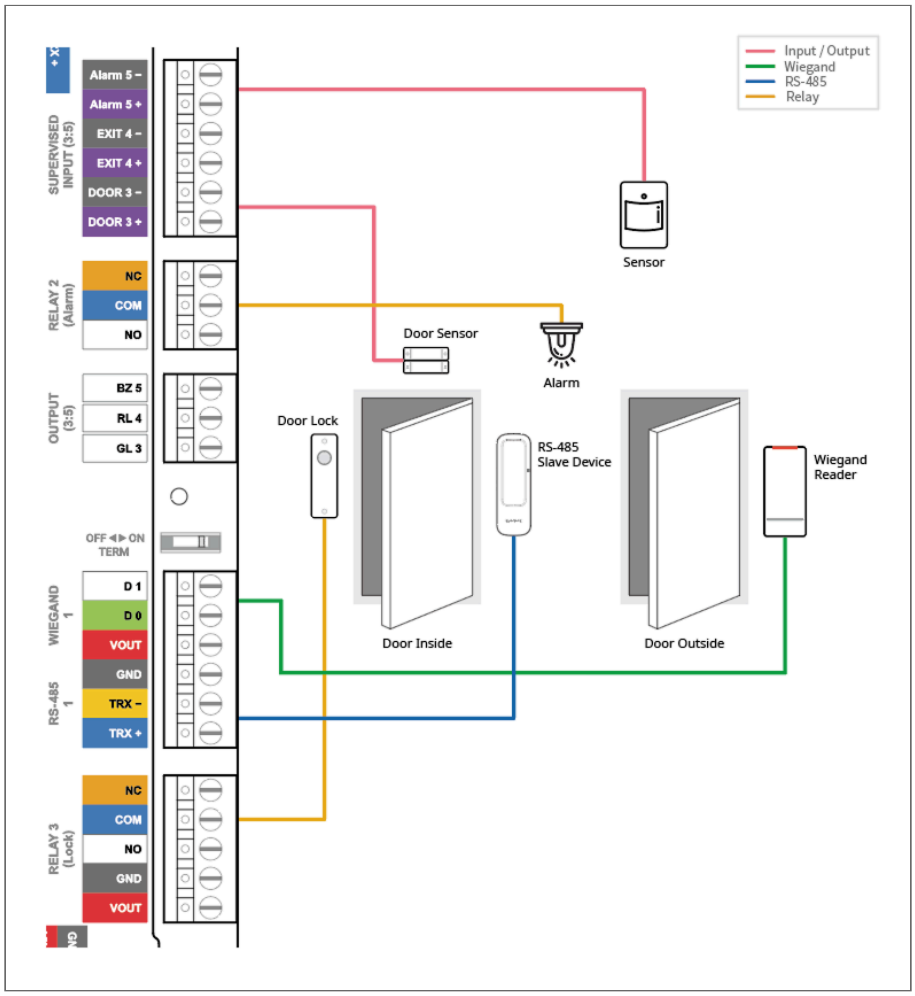
Item	LED	Status
Ethernet	Red/magenta blinking	Static IP connection failed
	Red/blue blinking	Dynamic IP connection successful
	Red/cyan blinking	Static IP connection successful
	Red/yellow blinking	Waiting for dynamic IP connection
	Red/red blinking	Dynamic IP connection failed
RS-485	Magenta/blue blinking	Slave device normal
	Magenta/yellow blinking	Slave device disconnected
	Magenta/red blinking	No slave device
RS-485 0	Yellow/blue blinking	Slave device normal
	Yellow/yellow blinking	Slave device disconnected
	Yellow/red blinking	No slave device
RS-485 1	Green/blue blinking	Slave device normal
	Green/yellow blinking	Slave device disconnected
	Green/red blinking	No slave device
System	White/white blinking	System lock (BioStar X's operational conditions and behavior) + Tamper on
	White/magenta blinking	System lock (Device's operational conditions and behavior) + Tamper on

Item	LED	Status
	White/blue blinking	Tamper on
	White/cyan blinking	BioStar X connection successful + Tamper on
	White/green blinking	BioStar X connection successful
	White/yellow blinking	System lock (BioStar X's operational conditions and behavior)
	White/red blinking	System lock (Device's operational conditions and behavior)

Installation example

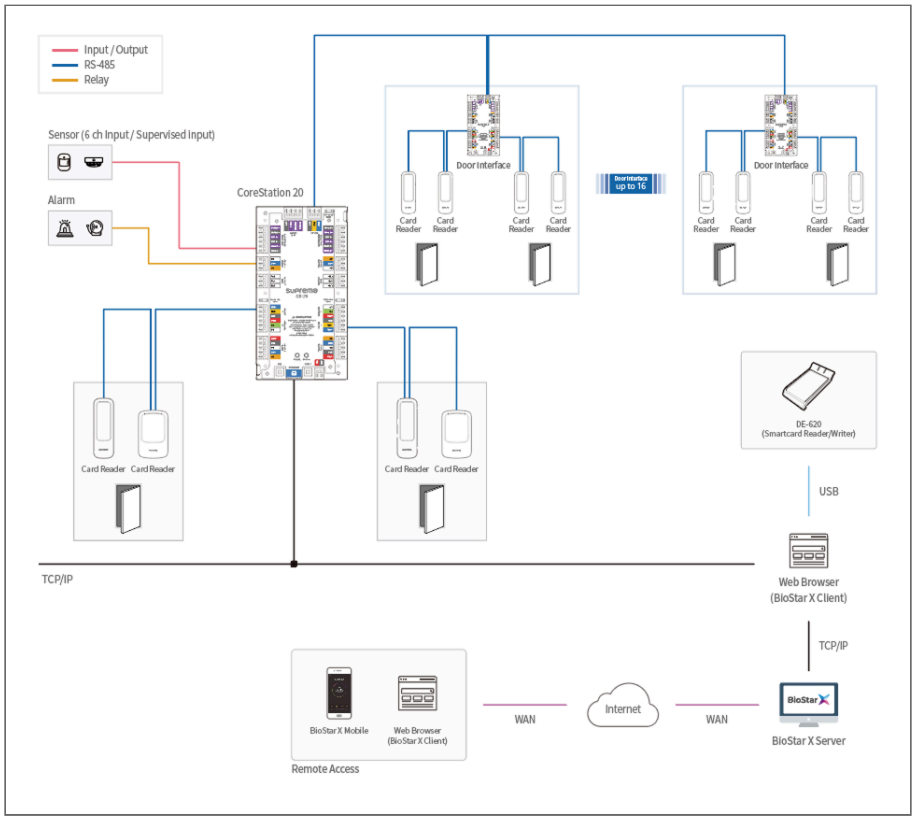
This product is designed for an enterprise-grade environment as a central access control system and can store information for up to 500,000 users.

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

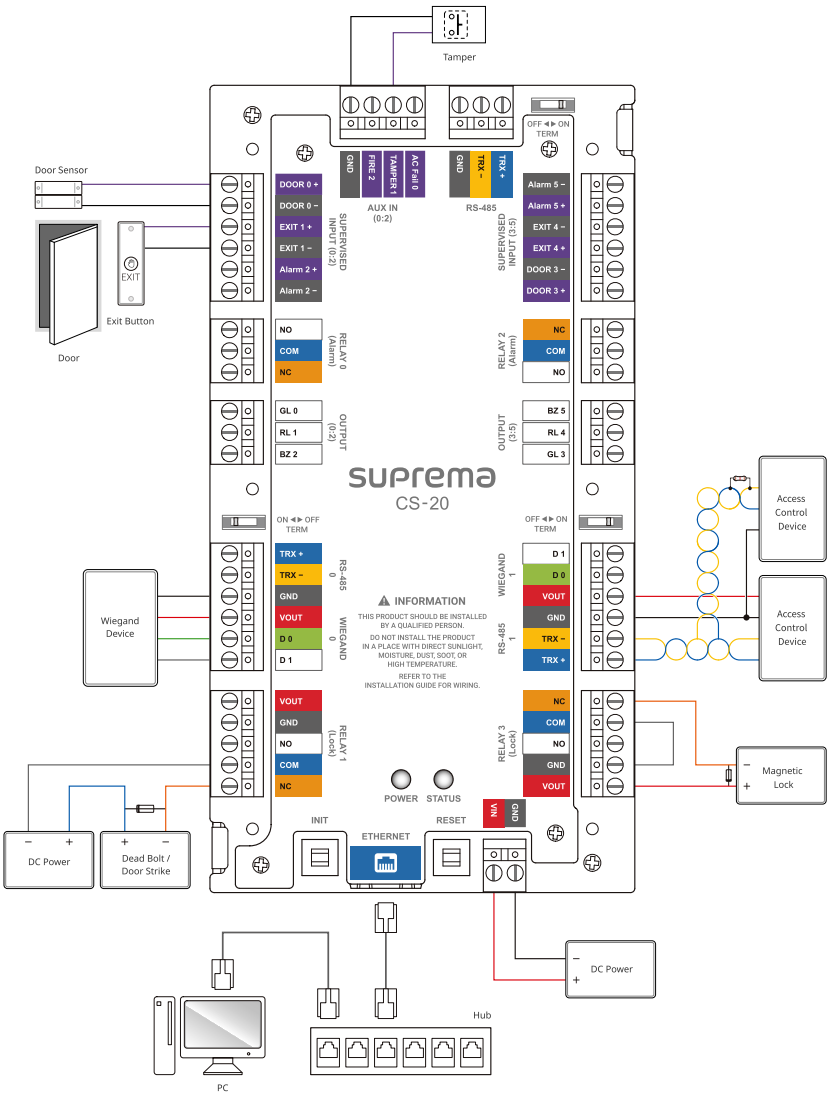
This product supports three RS-485 ports, and by connecting the Door Interface in a daisy chain, up to 34 doors can be configured.



Info

- Up to 2 devices can be connected per port for RS-485 0 and RS-485 1.
- If more than 3 devices are connected to a single RS-485 port, the desired device may not appear in the connectable list when searching for slave devices.
- If you connect the Door Interface as a slave to the host port, even if the connection with CoreStation 20 is interrupted, the slave devices connected to the Door Interface can identify the Facility Code of the card through the offline mode dedicated Facility Code and unlock the door.
- CS-20P Use only slave devices directly connected to the CS-20P reader port when a SAM card is installed.

Overall connection diagram

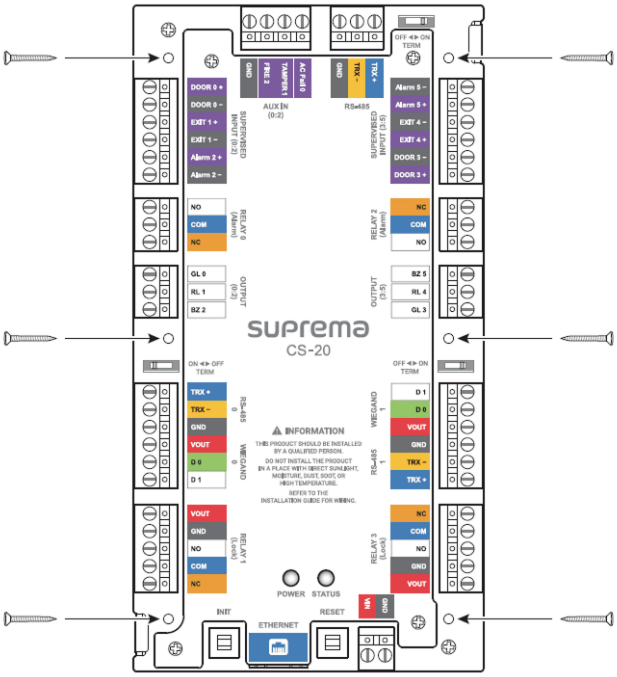


Installation

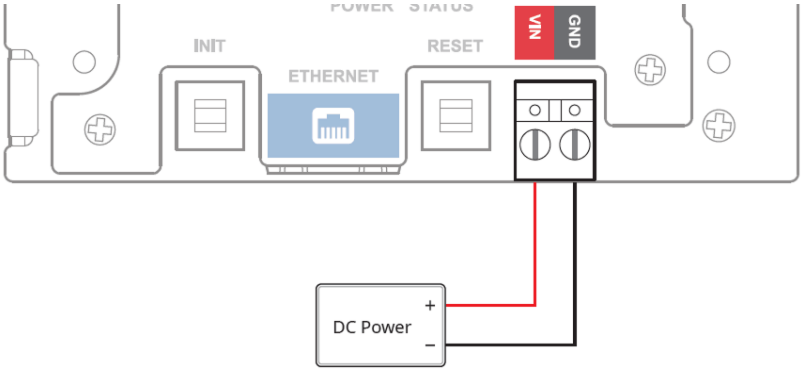
Provides the complete installation procedures and connection examples required for the device.

Product Fixation

Secure the product tightly with a fixing screw at the location to be mounted.



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.

Power-specific reader and lock power specifications

Power	Reader (maximum current, number of devices)	Lock (maximum current, number of devices)
DC 12V	600mA (300mA x 2)	1.2A (600mA x 2)
DC 24V	300mA (150mA x 2)	600mA (300mA x 2)
PoE+ (12V out)	600mA (300mA x 2)	600mA (600mA x 1)

Maximum extension length by cable specification

The distance that can be connected may vary depending on the cable specifications and installation environment used for power connection. If cable connections are made improperly it may cause the device to malfunction. This product supports DC 12V, DC 24V, and PoE+ power, so ensure to correctly connect power by checking the maximum extension length according to each cable specification.

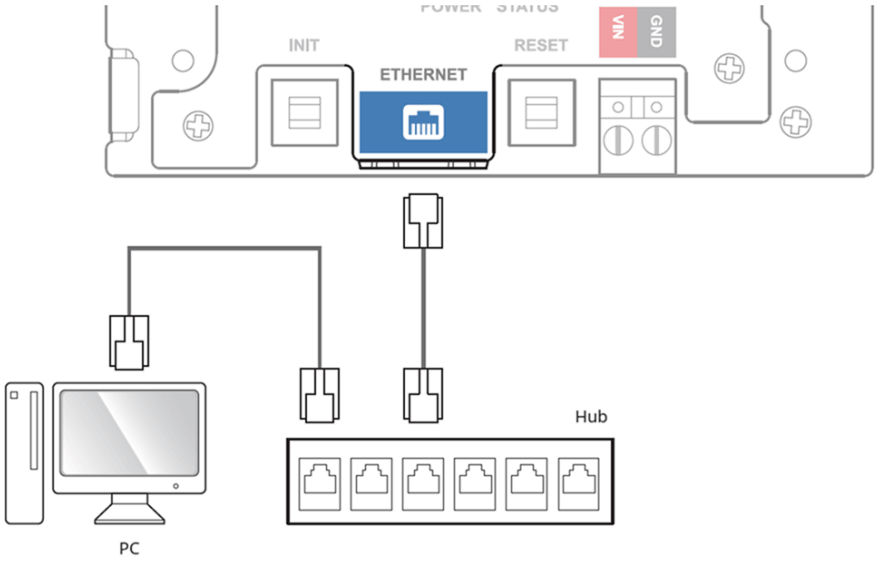
Cable Specification	DC 12V		DC 24V		PoE+ (12V Output)	
	Reader (300mA)	Lock (600mA)	Reader (150mA)	Lock (300mA)	Reader (300mA)	Lock (600mA)
14 AWG	380 m	190 m	1540 m	770 m	380 m	190 m
16 AWG	240 m	120 m	960 m	480 m	240 m	120 m
18 AWG	150 m	75 m	600 m	300 m	150 m	75 m

Network Connection

TCP/IP

LAN connection (connecting to a hub)

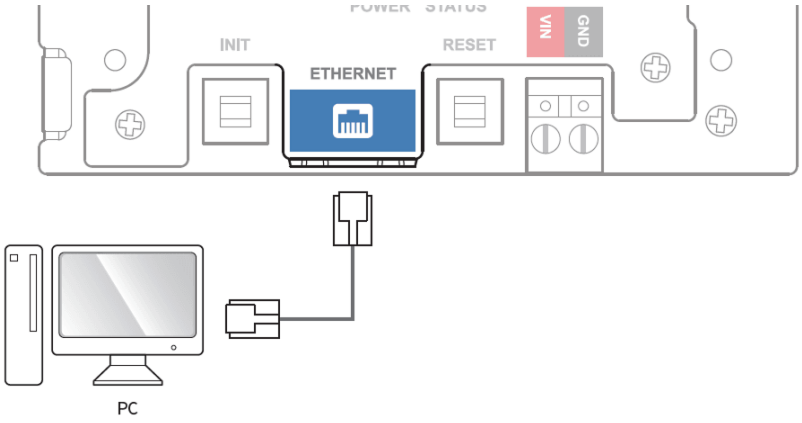
You can connect to a hub using a standard CAT-5 or higher cable.



LAN connection (connecting to a PC directly)

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

CS-20P Supports PoE+, which supplies power through an Ethernet cable. When using PoE+, only one Lock connection is supported.



Network ports and services

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

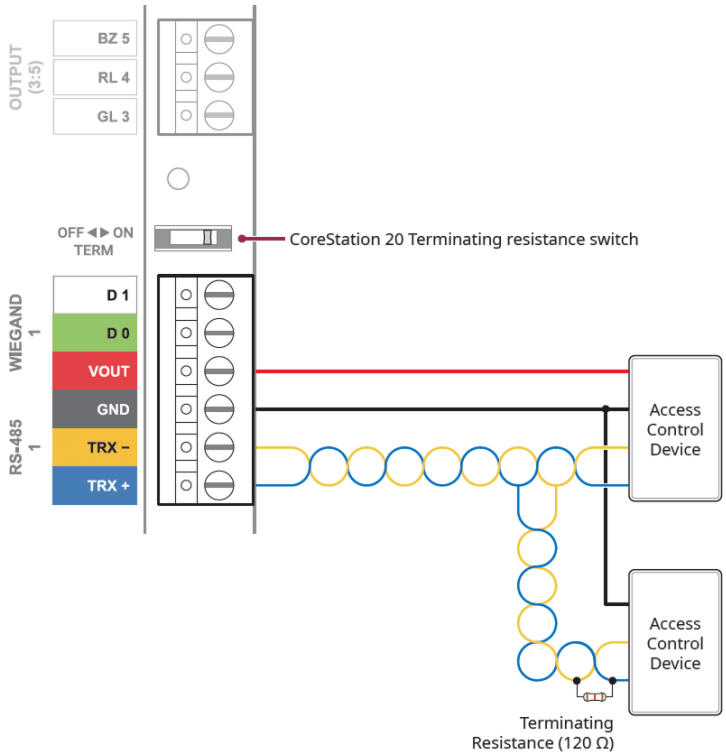
Protocol	Service
TCP	Used for communication services between the server and the device, and for the device operation status switching service.
UDP	Used for the device discovery service to search for devices on the network.

Info

These ports provide the product's normal network features. When configuring firewall rules or network security settings, allow these ports.

RS-485 Connection

This product supports three RS-485 ports, and by connecting the Door Interface in a daisy chain, up to 34 doors can be configured.



Info

- The total number of RS-485 devices connected to the product must not exceed 84. (Including Door Interface)
- Up to 2 devices can be connected per port for RS-485 0 and RS-485 1.
- If more than 3 devices are connected to a single RS-485 port, the desired device may not appear in the connectable list when searching for slave devices.
- 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

The product has two types of relay ports—Alarm and Lock—each of which can be used for specific purposes.

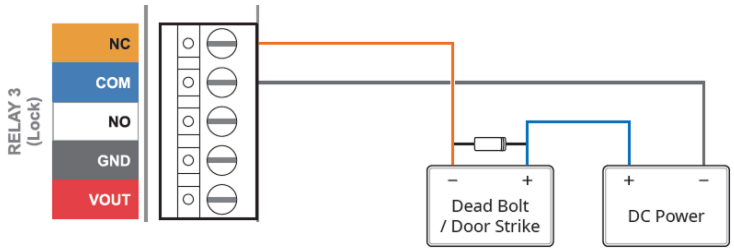
- **Alarm**: Can be connected to devices that generate warning sounds or intrusion alerts, such as warning lights, sirens, or buzzers.
- **Lock**: Can be connected to devices for door locking and unlocking, such as electric strike locks or magnetic locks.

> **Caution**
> When using a magnetic lock, connect the lock power directly.

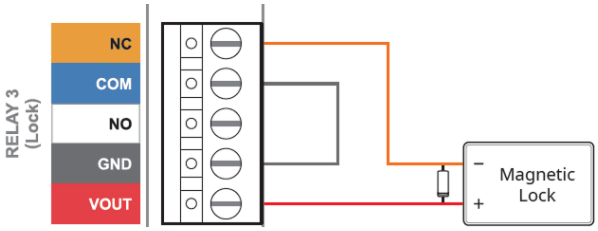
Fail Safe Lock

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**
> Install a diode near both sides of the door lock wiring as shown in the figure to protect the relay from the reverse current that occurs when the door lock operates. 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.



When using a magnetic lock, directly connect the lock power to the **GND** and **VOUT** of the Lock ports as shown in the figure below.



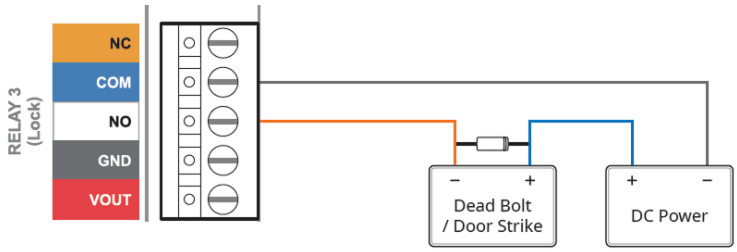
> **Caution**
> Only magnetic locks can be used when connecting the lock power directly.

Fail Secure Lock

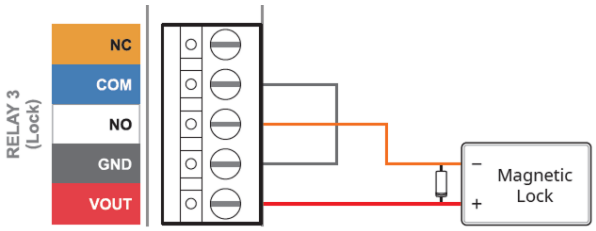
In order to use the Fail Secure Lock, connect **NO** relay as shown in the figure below. There is normally no current flowing through the relay for the Fail Secure Lock. When the current flow is activated by the relay, the door will open. If the power supply to the product is cut off due to a power failure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

Info

Install a diode near both sides of the door lock wiring as shown in the figure to protect the relay from the reverse current that occurs when the door lock operates. 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.



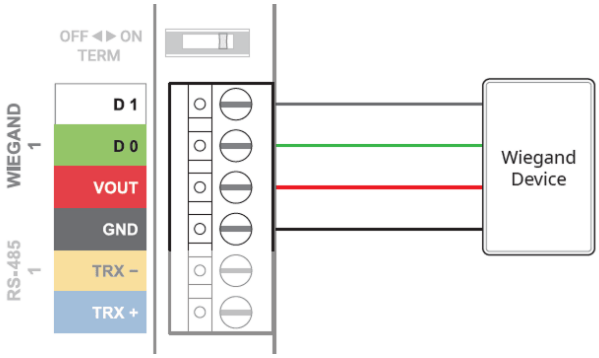
When using a magnetic lock, directly connect the lock power to the **GND** and **VOUT** of the Lock ports as shown in the figure below.



Caution

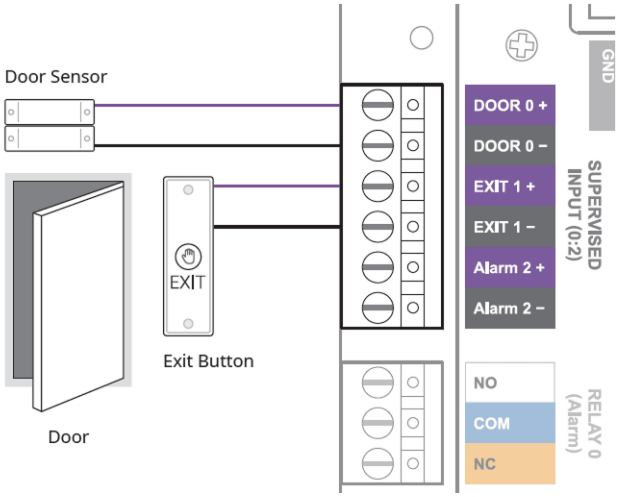
Only magnetic locks can be used when connecting the lock power directly.

Wiegand Connection



Door sensor and exit button

SUPERVISED INPUT ports No. 0 - No. 5 can be set to be used for normal Input or Supervised Input.

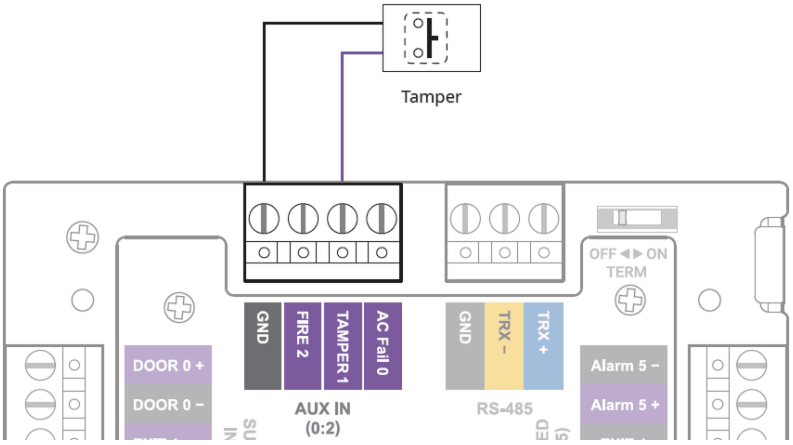


Info

The SUPERVISED INPUT **Alarm** port can be used by connecting 1 kΩ, 2.2 kΩ, 4.7 kΩ, or 10 kΩ resistors. After connecting the appropriate resistor to the input device, set the resistor value the same in BioStar X.

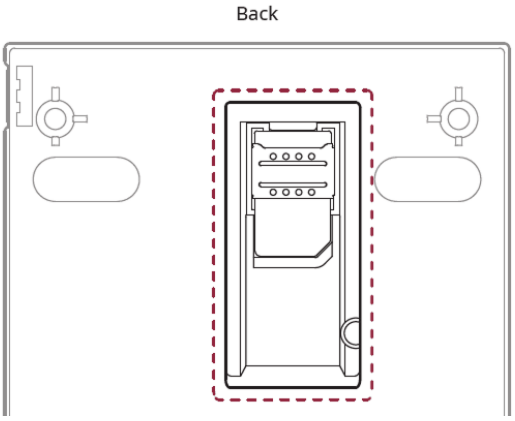
AUX IN

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



SAM card slot CS-20P

You can use a SAM (Secure Access Module) card.



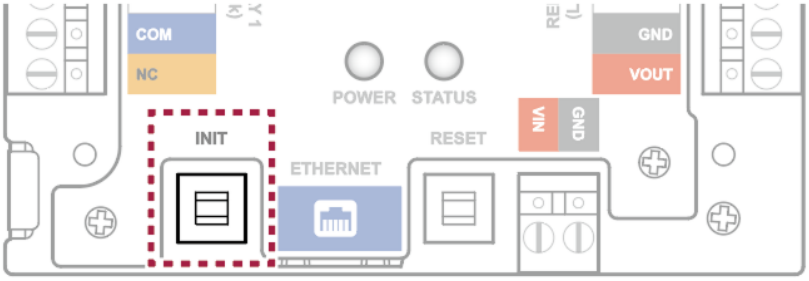
Info

CS-20P Use only slave devices directly connected to the CS-20P reader port when a SAM card is installed.

Initialize Network Settings

Initialize the device's network settings.

1. Connect the device to power.
2. Press and hold the **INIT** button for at least 3 seconds.



3. Network settings initialize as follows. In BioStar X, connect the device using the initialized network information.
   - **TCP/IP address**: DHCP is enabled, so the device gets an IP address automatically.

     > **Info**
     > If DHCP address assignment fails, the device sets the address to 169.254.x.x.

   - **Server mode**: Prevents the device from requesting a direct connection to the server.
   - **RS-485**: Sets the communication speed to 115200 bps.

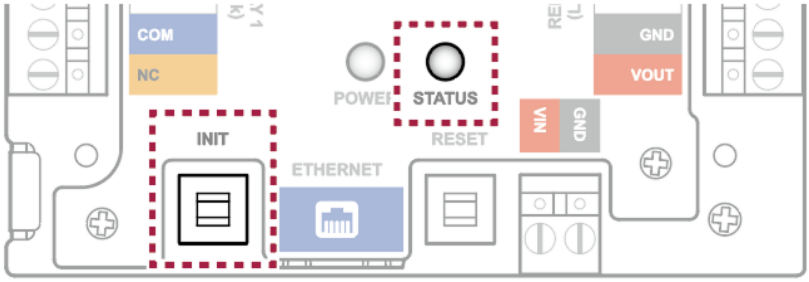
Factory Default

Delete all information stored on the device and initialize the settings.

> **Info**
>
> - You can only use Factory Default when the root certificate is stored on the device.
> - For more information on how to initialize the product, contact Suprema Global Technical Support Team.

Initialize on the device

1. Connect the device to power.
2. Quickly press the **INIT** button three times.



3. When the **STATUS LED** blinks yellow, press and hold the **INIT** button.

Initialize in CoreStation Setup Manager

1. Connect the product to the PC using an Ethernet cable.
2. Enter `https://169.254.0.1:3001` in the web browser address field, then open CoreStation Setup Manager.

   > **Info**
   > Use a web browser version 75 or higher of Chrome.

3. Click **CONFIGURE**.
4. In **Information**, click **Factory Default**.

> **Info**
>
> - 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 1.0.0 or later.
> - 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.

Product Specifications

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

General

Model Name	**CS-20, CS-20P**
CPU	**1.2 GHz Single Core**
Memory	**4 GB Flash + 256 MB RAM**
Crypto Chip	**Supported**
LED	• **POWER: RED single-color** • **STATUS: Multi-color**
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**
Certifications	**CE, UKCA, KC, FCC, RCM, IC, RoHS, REACH, WEEE, EAC**

Capacity

Max. User	**500,000**
Max. Credentials (1:1)	• **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	**3 ch**
RS-485 Communication Protocol	**OSDP V2 compliant**
Wiegand	**2 ch**
Relay	**4 relays**
Input	**6 ch**[1)]
Output	**6 ch**
Supervised Input	**6 ch**[1)]
AUX Input	**3 ch (AC POWER FAIL, Tamper, Fire)**
PoE+[2)]	• **CS-20: Not supported** • **CS-20P: Supported (IEEE 802.3at compliant)**
SAM Slot	• **CS-20: Not supported** • **CS-20P: Supported**

Electrical

Power	**12 Vdc**	**Current: Max. 2.8 A**
	24 Vdc	**Current: Max. 1.4 A**

Power Output	**12 Vdc**	• **Reader: Max. 0.6 A (0.3 A x 2)** • **Lock: Max. 1.2 A (0.6 A x 2)**
	24 Vdc	• **Reader: Max. 0.3 A (0.15 A x 2)** • **Lock: Max. 0.6 A (0.3 A x 2)**
	PoE+ (12V out)	• **Reader: Max. 0.6 A (0.3 A x 2)** • **Lock: Max. 0.6 A (0.6 A x 1)**
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) You can select between Input or Supervised input.

2) Requires PoE+ (IEEE 802.3at, 30 W) or PoE++ (IEEE 802.3bt, 60–100 W) power. Standard PoE (IEEE 802.3af, 15.4 W) is not supported. Using standard PoE may cause devices to operate unstably or be permanently damaged. Before connecting the device, make sure your network switch or PoE injector supports PoE+ or PoE++.

Info

Product specifications are subject to change without notice for performance improvement.

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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- The source modified based on Linux kernel 5.x and uclibc library included in this product can be downloaded by contacting the Suprema Technical Support Team.

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