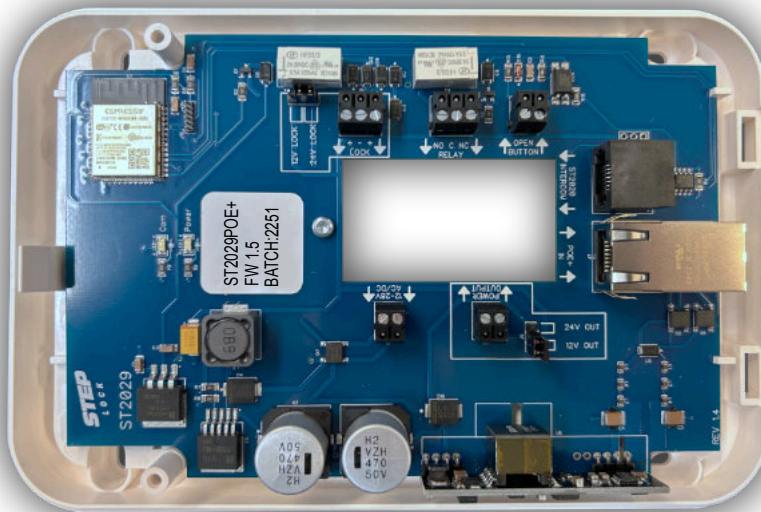


# ST2029 PoE+ Door Central

Article No. ST2029-POE



## Disclaimer

*This user manual serves as a resource for users to operate and maintain the product effectively. It is not designed to cover all aspects of the product or its usage comprehensively. The manufacturer or publisher accepts no liability for any inaccuracies or omissions in this manual.*

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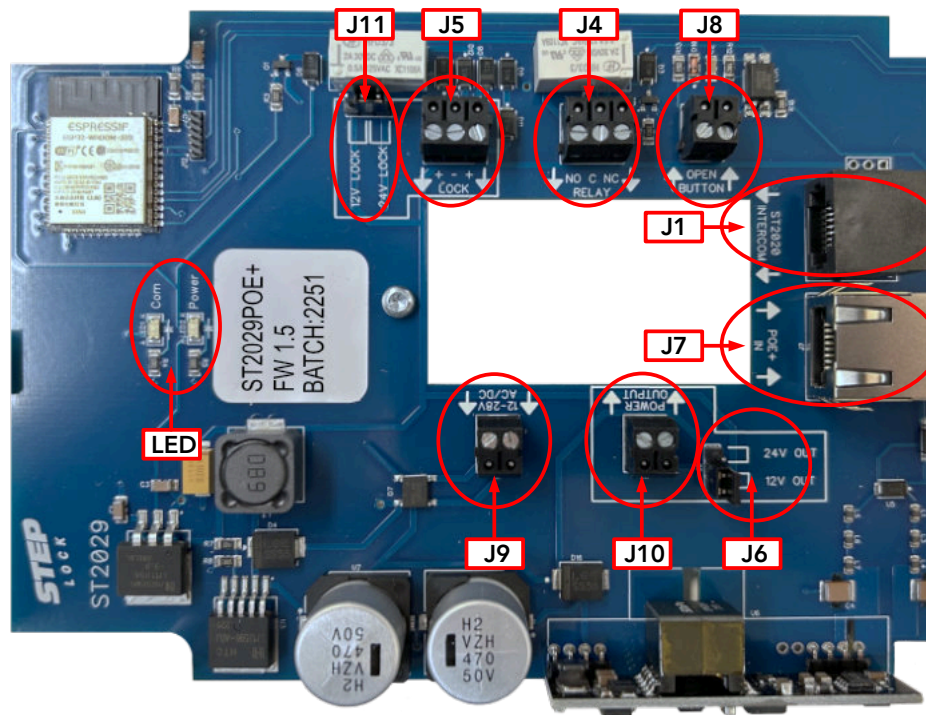
## 1. Introduction

This article provides instructions for setting up, installing and using the ST2029 PoE+ Door Central.

**NOTE:** There are two versions of the ST2029; PoE+ and LTE. This article only applies to the PoE+ version. For information on the LTE version, please refer to the User Manual ST2029 LTE Door Central.

## 2. Overview of PCB-board

Following is an overview of the PCB board for the ST2029 PoE+ Door central.



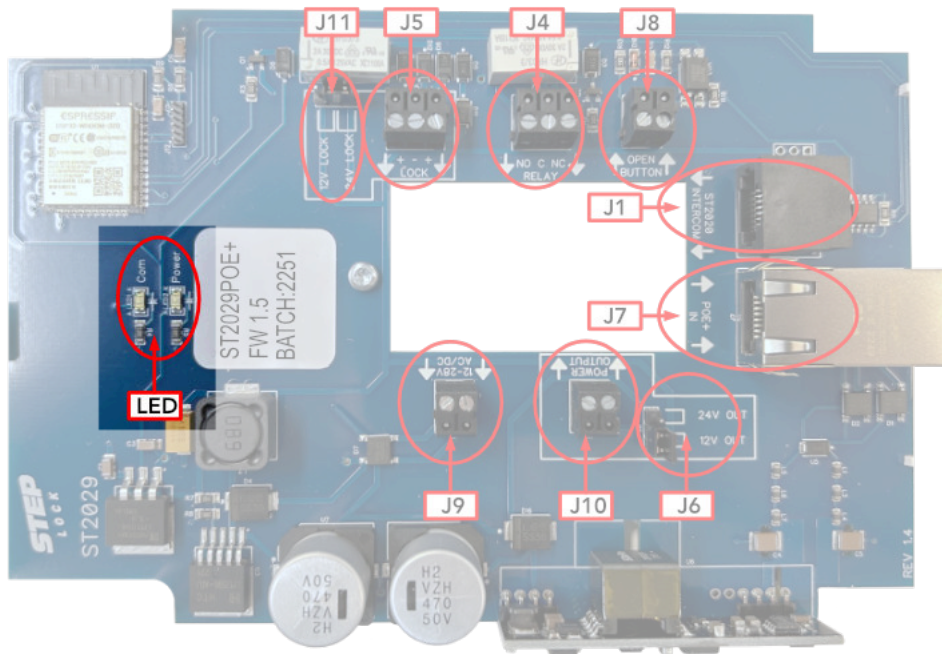
SA00201A Fig.001

## 2.1. Status LED indicators

The ST2029 PoE+ PCB board is equipped with two status LED indicators that provide important information about the device's status;

- The first indicator, LED1, blinks blue when there is successful communication with the intercom. This indicator should blink approximately every five seconds. If LED1 does not blink or blinks in a different pattern, it may indicate an issue with the communication between the ST2020 intercom and the ST2029 PoE+.
- The second LED indicator, LED2, remains a solid blue colour when the ST2029 PoE+ device is powered and functioning correctly. This indicator provides reassurance that the device is operating as intended.

It is essential to note that there are no other colours or blinking patterns used for these LED indicators to signify different states.



SA00201A Fig.002

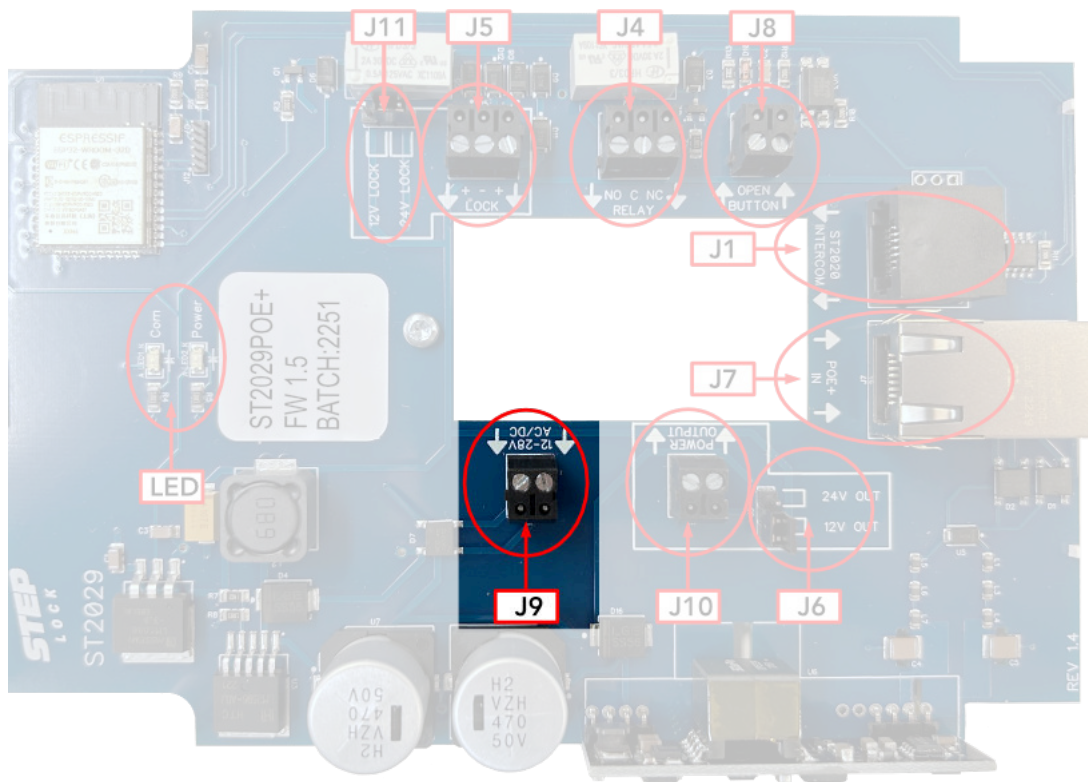
## 2.2. Power option

### 2.2.1. J9 - AC/DC External Power Source

The J9 input is a connection point for an external power source, which can be either alternating current (AC) or direct current (DC). This input allows the ST2029 PoE+ to be powered by an external power supply.

The acceptable range for input voltages is between 12 volts and 28 volts. This means that any voltage within this range can be safely used to power the device.

**NOTE:** It is important to note that using a voltage outside of this range may cause damage to the device and should be avoided. Additionally, it is recommended to use a power supply that is balanced and ripple-free, with a minimum capacity of 2 amperes. Take care to choose a power supply that is suited for fine electronic circuitry.



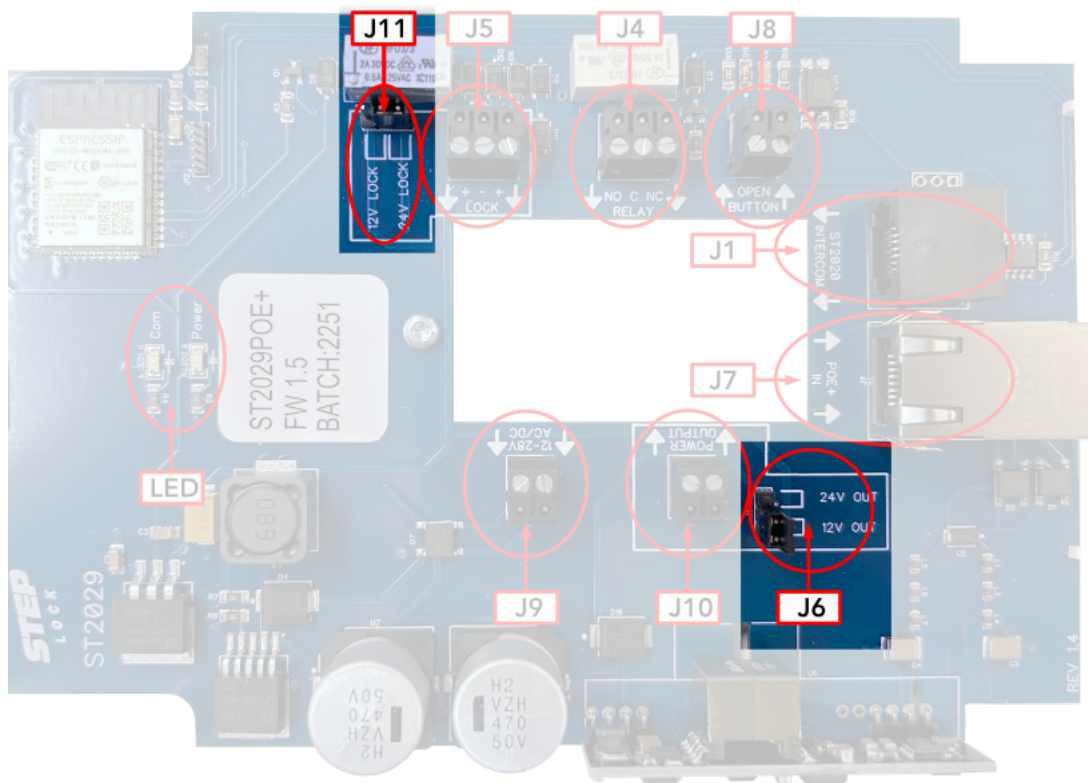
SA00201A Fig.003

### 2.2.2. J6 & J11 - Strapping pins

The ST2029 PoE+ has two options for modifying the output voltage by utilising strapping pins.

- The J6 strapping pin is responsible for altering the power output for external devices and has two available options: 12 volts and 24 volts.
- The J11 strapping pin is in charge of adjusting the power output for the "J5 - Lock output". The J11 pin also has two options: 12 volts and 24 volts.

**NOTE:** It is important to note that if the ST2029 PoE+ is powered by an external 12-volt power supply, neither of the strapping pins can be set to 24 volts. This is because the PCB board is equipped with step-down regulators only.



SA00201A Fig.004

### 2.2.3. Power budget

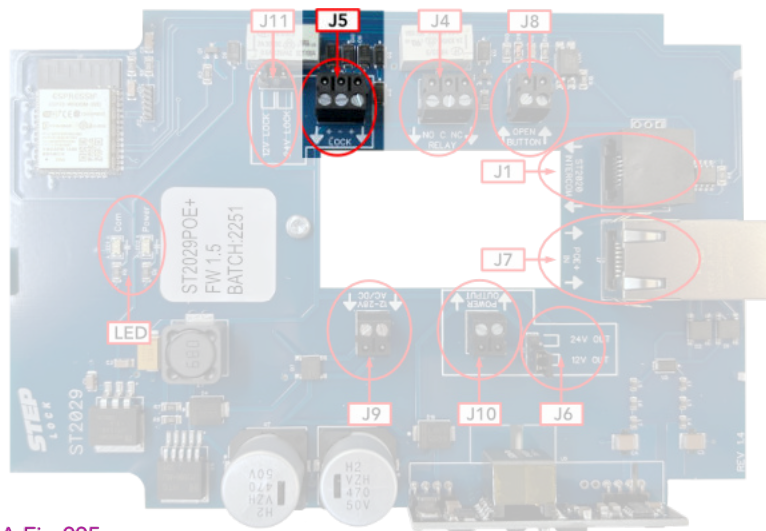
It is important to note that all the measurements provided are specifically for the ST2029 PoE+ Door Central only and do not include the ST2020 intercom. When using the ST2029-PoE+, the power consumption will depend on the voltage used to power the device. If the ST2029-PoE+ is powered using a 24-volt supply, it will consume approximately 60 milliamperes (mA) of current. Conversely, if a 12-volt supply is used, the ST2029-PoE+ will require approximately 100 mA of current.

## 2.3. Outputs

### 2.3.1. J5 - Lock Output

The pins on the "Lock-relay" are identified with the labels "+ - +". This corresponds to the "NO+ | GND | NC+" configuration. In practical terms, if you have a fail-secure electronic lock setup, you would need to connect the "+" wire to the left pin (NO+). Conversely, if you have a fail-safe configuration, the "+" wire should be connected to the right pin (NC+).

**NOTE:** It is important to note that the correct wiring configuration depends on the type of electronic lock used. A fail-secure configuration locks the door in the event of a power failure, while a fail-safe configuration unlocks the door in the same situation.



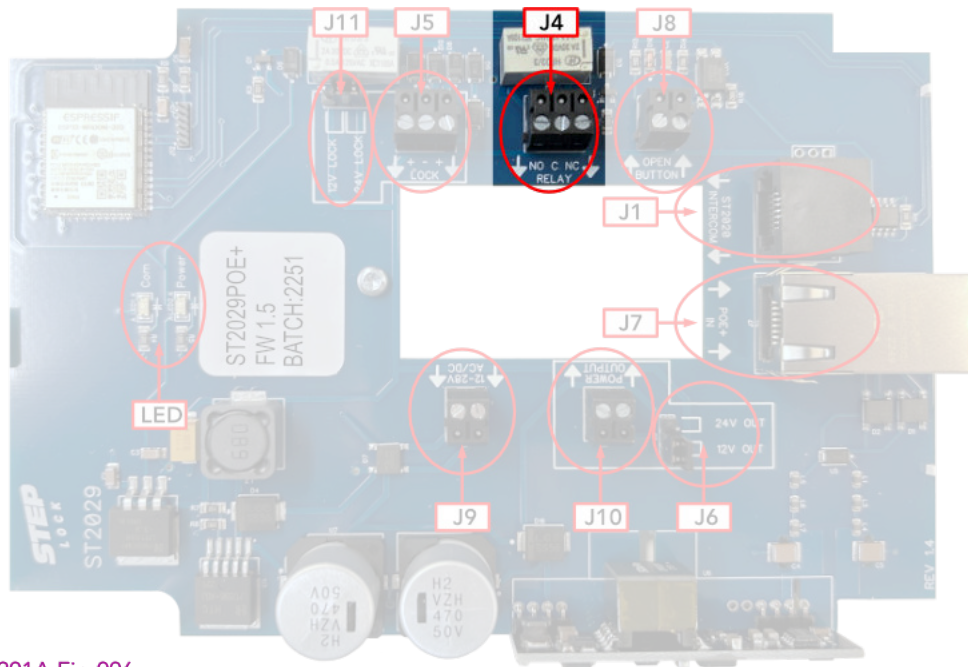
SA00201A Fig.005



### 2.3.2. J4 - Relay Output

The J4 port, also known as the Relay Output, is a potential-free relay that is linked to the J5 Lock output with a 1000ms delay feature. This means that when the J5 Lock output is triggered, there is a one-second delay before the J4 Relay output is activated.

This delay can be useful in a variety of situations where a brief pause is needed between triggering the J5 Lock output and activating the J4 Relay output.



SA00201A Fig.006

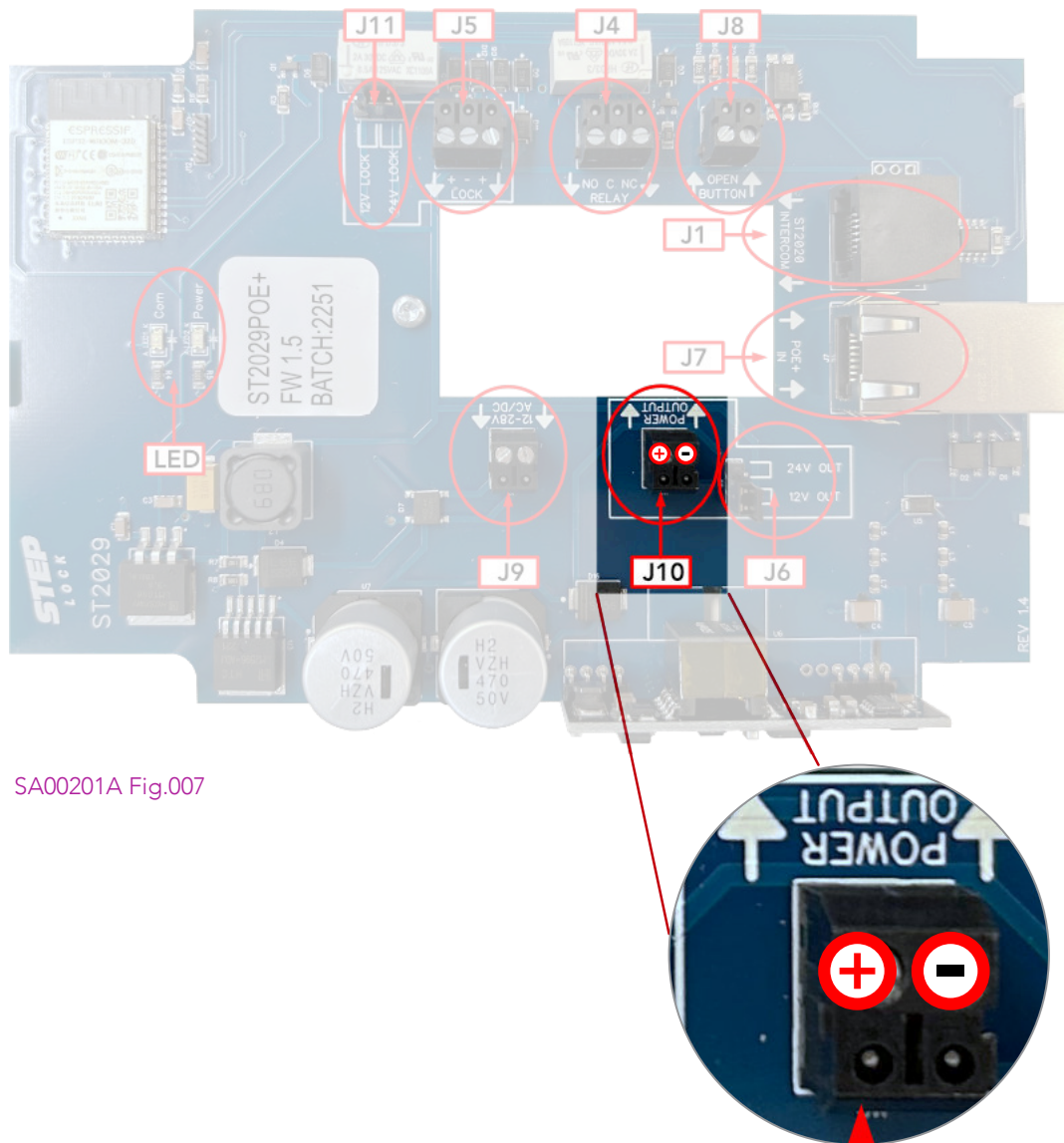
### 2.3.3. J10 - Power Output

J10 is a power output port that is explicitly designed to provide a stable power source for external accessory devices only. This port can supply the necessary voltage and current required to ensure efficient and reliable operation of compatible devices.

The use of J10 enables external accessory devices to draw power from the ST2029 PoE+, eliminating the need for a separate power supply. This can be beneficial in situations where you -for example - have an exit button that requires power.

**NOTE:** It is important to note that J10 is designed to output direct current (DC) power only.

**IMPORTANT:** It is important to note that J10 is not intended for cascading connections, meaning it is not designed to be used as a power supply for other devices or systems. To avoid any potential damage, it is recommended to use J10 solely for powering external accessories devices that are compatible with the voltage and current provided by the port.



SA00201A Fig.007

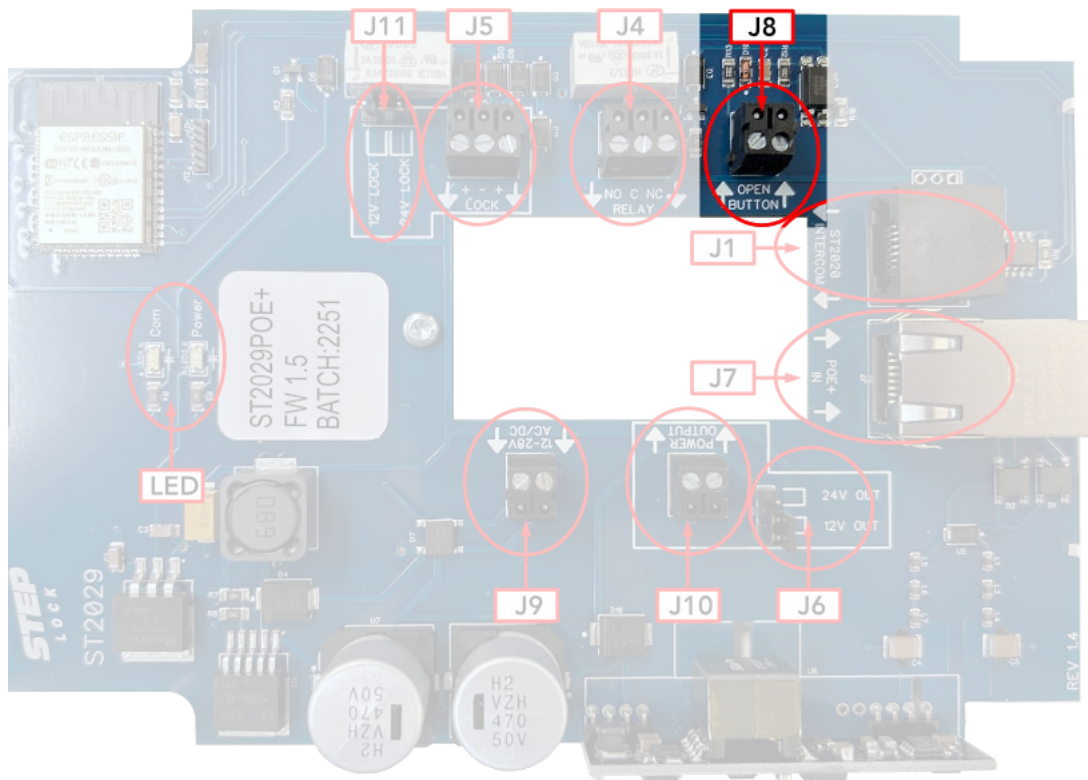
## 2.4. Inputs

### 2.4.1. J8 - Open button

The J8 port, also known as the Open button input, is designed to trigger both the J4 Relay output and the J5 Lock output simultaneously when activated. This means that when the J8 port is triggered, it will result in the immediate activation of the J4 and J5 ports.

This functionality can be useful for controlling the access to a specific area, as it enables the device to unlock the door and activate additional systems or devices simultaneously. For instance, it could be used to activate a camera system or a notification system to alert security personnel.

**NOTE:** It is important to note that triggering the J8 port will cause an immediate and simultaneous activation of the J4 and J5 ports. Therefore, it is recommended to use this feature carefully and with proper consideration of the potential consequences.



SA00201A Fig.008

## 2.5. J1 - ST2020 Intercom

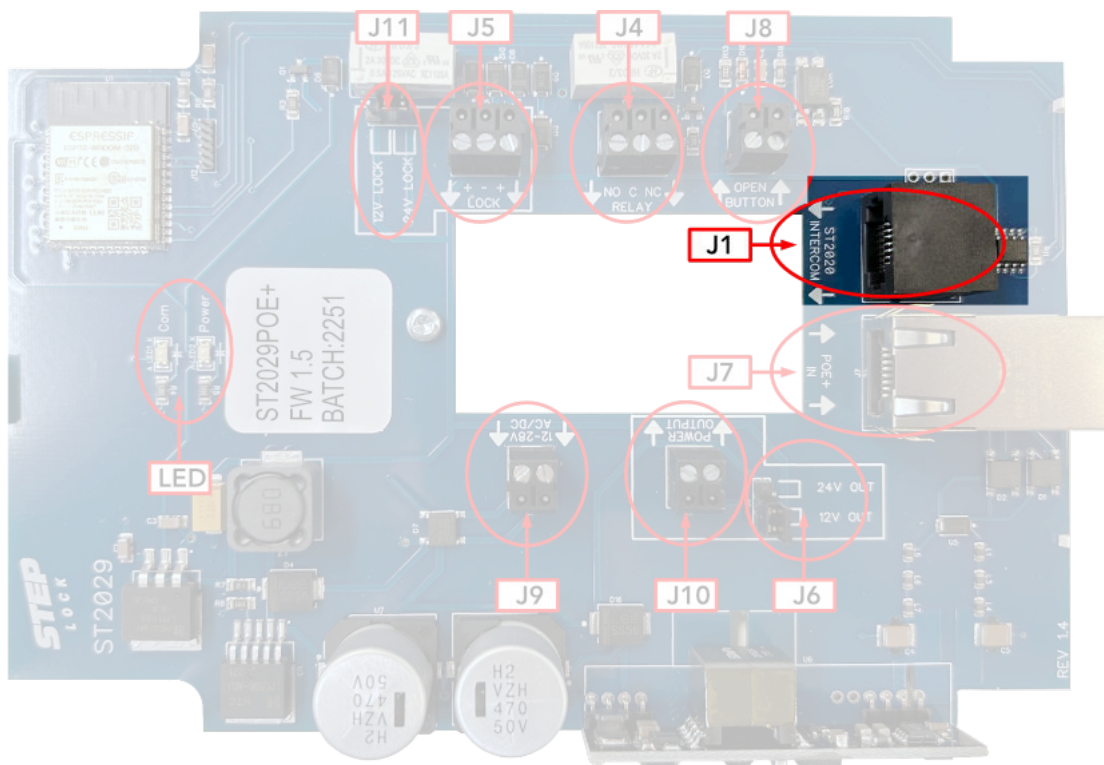
The J1 port, also known as the ST2020 Intercom, is a multi-functional port that provides power, communication (RS485), and Ethernet to the ST2020 intercom.

The power delivered through J1 ensures that the intercom is continuously powered. There is no need to power the ST2020 additionally.

The RS485 communication allows for two-way communication between the intercom and the ST2029 PoE+ Door CentralL.

Moreover, the Ethernet connection provided by J1 enables the intercom to connect to a local network or the internet, enabling residents to grant access to visitors via their mobile devices.

**NOTE:** It is important to note that the RJ45 cable used with J1 is split at the intercom end, meaning that it is divided into separate connections for power, communication, and Ethernet.

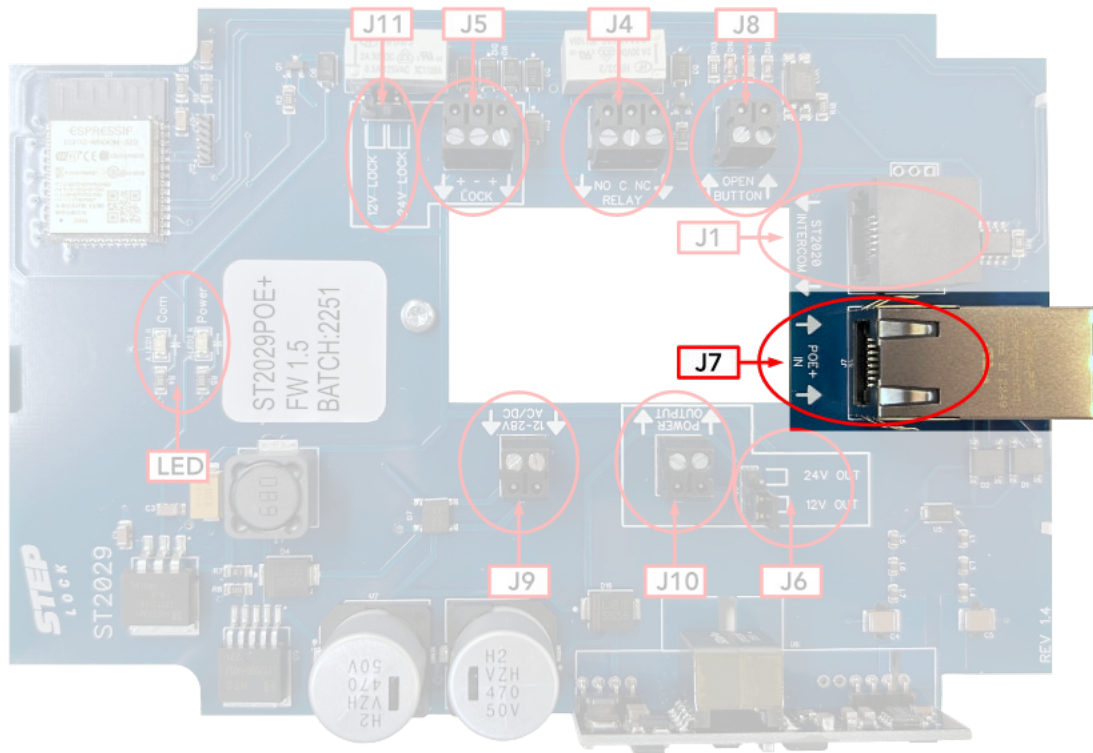


SA00201A Fig.009

## 2.6. J7 - PoE+ (Internet)

The J7 PoE+ input is an integral part of the intercom system, serving two essential functions. Firstly, it provides power to the ST2029 PoE+ unit, which subsequently powers the ST2020 intercom.

When it comes to providing power to the ST2029 PoE+ unit, it is essential to use a PoE+ IEEE802.3at ready switch with a power output of 30W per port. This type of switch is specifically designed to supply power over Ethernet and can efficiently provide the required power to the ST2029 PoE+ unit.



SA00201A Fig.010

### 3. Step-by-step installation

**WARNING:** Only power on the ST2029 once you have carefully read and understood these instructions and confirmed that the unit is properly connected. Failure to follow these instructions may result in damage to the product and render it inoperable.

#### 3.1. Preparation

##### 3.1.1. Software preparation

Before installing the ST2029 PoE+ Door Central, it is important to ensure that the following tasks have been completed in Steplock Cloud:

- Create a Cloud tenant for the end customer. This tenant will serve as a platform for managing and monitoring the ST2029 device and its associated components.
- Create a Property within the end customer's Cloud tenant. This will allow the end customer to manage and monitor the ST2029 device and its associated components within a specific location.
- Add the MAC address of the ST2020 intercom to the end customer's Cloud tenant. This will ensure that the intercom is properly integrated with the ST2029 device and is able to function effectively.

##### 3.1.2. Cable preparation

Prior to installing the ST2029 PoE+ Door Central, it is crucial to ensure that all necessary cables are properly installed in the door location.

The first cable required is a CAT 6 cable for the connection between the Door Central and the ST2020 intercom. This cable provides power and Ethernet connectivity for two-way communication between the devices. To ensure proper installation, it is recommended to test the CAT 6 cable with a network tester to confirm that it is working correctly.

In addition to the CAT 6 cable, standard wiring is required to connect the electronic lock, exit button, KAC, and other related components to the Door

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Central. This wiring enables the Door Central to monitor and control the operation of these components.

It is important to install these cables securely to prevent any complications or errors during the installation process.

**NOTE:** Before powering on the ST2029, it is recommended to measure the power supply coming to the device to ensure that it is within the recommended range. This will help to avoid any potential issues with the device's power supply and ensure smooth operation.

### 3.1.3. Tools

The ST2029 PoE+ Door Central includes a fully terminated CAT6 cable with a split end for the connection between the Door Central and the ST2020 Intercom. However, there may be situations where a longer cable is needed or the RJ45 plug needs to be removed to thread holes and other obstacles. In such cases, it is important to have the following tools on hand for a successful installation:

- A good quality RJ45 termination tool is required for terminating the CAT6 cable. This tool ensures a secure and proper termination of the cable to the RJ45 plug, which is crucial for a stable and reliable connection between the Door Central and the intercom.
- To ensure a stable and dependable connection between the Door Central and the intercom, it is crucial to use a high-quality RJ45 network cable tester to test the CAT6 cable after termination. This tool will confirm that the cable is properly terminated and working correctly.

**NOTE:** However, it's important to note that only pins 1, 2, 3, and 6 can be tested since pins 4, 5, 7, and 8 are split on the intercom side and cannot be tested. Pin 7 and Pin 8 are used for power and PWR\_GND, respectively, while pins 4 and 5 are utilised for RS485 A and B communication.

- RJ45 plugs are required for terminating the CAT6 cable. Using good quality plugs ensures a secure and proper termination, which is important for a stable and reliable connection. Only use short plugs.

- CAT6 cable, either shielded or unshielded, is required for the connection between the Door Central and the intercom. The choice of shielded or unshielded cable depends on the specific installation environment and requirements.

#### 3.1.4. Physical Installation

Before proceeding with the installation process, it is important to ensure that all required cables have been installed between the Intercom location (Point A) and the ST2029 PoE+ Door Central location (Point B). The cables should be correctly terminated and ready to be connected.

It is crucial to verify that all cables are installed properly and securely to prevent any potential complications or errors during the installation process.

It is recommended to visually inspect all cables and use a network tester to confirm that the cables are in good working condition before proceeding with the installation. This will help to prevent any potential issues that may arise due to faulty or improperly installed cables.

**IMPORTANT:** Always remove power to the ST2029 PoE+ before connecting devices to it.

#### 3.1.5. Placement / Mounting

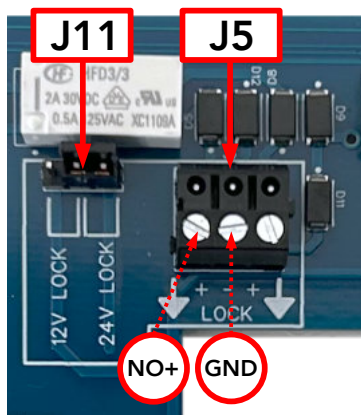
One common location for mounting the ST2029 PoE+ Door Central is above the door, as this is typically where most of the electronic lock, exit button, and door operator connections are located. By installing the Door Central in this location, it can easily and efficiently control and monitor the operation of these components.



### 3.2. Connecting electronic lock

#### 3.2.1. Fail Secure

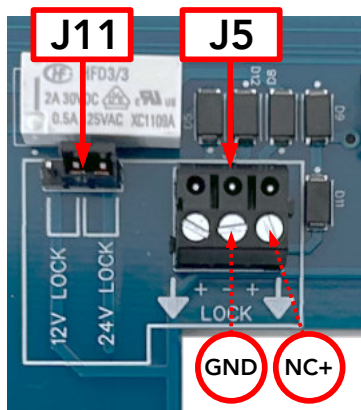
To configure the ST2029 for fail secure mode, connect the positive (“+”) wire to the left pin of the J5 Lock Output and the negative (“-”) wire to the middle pin of the J5 Lock Output, as shown below.



SA00201A Fig.011

#### 3.2.2. Fail safe

To configure the ST2029 PoE+ Door Central for fail-safe operation, connect the positive (+) wire to the right pin on J5 Lock Output and the negative (-) wire to the middle pin (-) of J5 Lock Output. This wiring configuration ensures that the door will remain unlocked in the event of a power failure, allowing for safe exit from the building.



SA00201A Fig.012

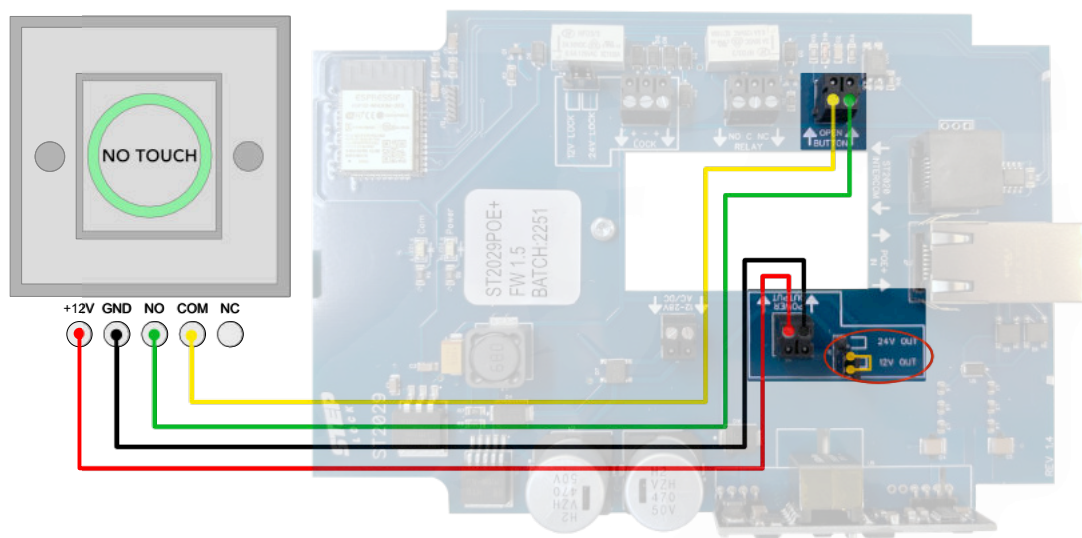
**NOTE:** If electronic locks other than Steplock are being used, it is recommended to install a protection diode (e.g. 1n4004) between the electronic lock and the output.

### 3.3. Connecting opening button

Connecting the exit/open button to the ST2029 is a simple process. Pin A and pin B should be connected to the exit button. If the exit/open button requires 12V power, it can be supplied separately using the J10 - Power output. For instance, a touch-less exit button that requires 12V has been used in the following example.

Additionally, before connecting the exit/open button, it is recommended to verify the voltage requirements of the button, so you can set the strapping pins on J6 for correct voltage.

**NOTE:** In this example "Left pin" refers to the pin on the left side with the PCB board oriented so that the "Power Out" is upside down. See below illustration.



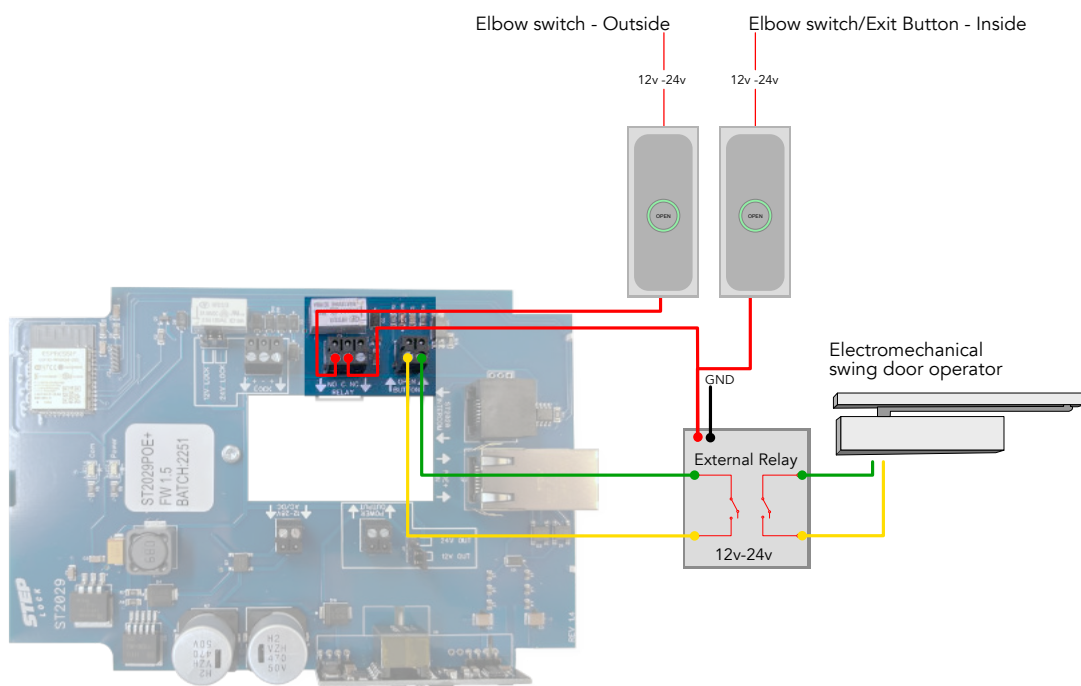
SA00201A Fig.013

Begin by setting the strapping pin on J6 to 12V OUT. Next, connect the +12V (RED) wire from the exit button to the left pin on J10. After that, proceed to connect the GND (BLACK) wire to the right pin on J10. Continue by connecting the NO (GREEN) wire to the right pin on J8, and finally, connect the COM (YELLOW) wire to the left pin on J8.

**NOTE:** Take care to measure your total power budget when you are using J10 - Power Output.

### 3.4. Connecting swing door operator

If you intend to use the J4 Relay output to trigger a door on a "open door schedule" with swing door operator, you'll need to add an external relay to the system. This is a necessary to prevent constant triggering of the swing door operator and keeping the door open all the time.



SA00201A Fig.014

Ensure that both elbow switches receive power. You can use an external power source or J10 Power Output, depending on your total power budget. When using J10, it's important to calculate the total budget carefully. It's also crucial to determine whether the external relay requires 12V or 24V and plan the power budget accordingly.

To connect the system;

- Connect the elbow switch on the outside to the normally open (NO) contact of the J4 relay output.
- Connect the common (C) contact of J4 relay output to the power input of the external relay.
- Connect the elbow switch/exit button on the inside to the power input of the external relay.
- The J8 - Open button should be connected to the output of the external relay,
- Connect the swing door operator to the secondary output of the external relay.

**NOTE:** This particular system configuration is designed to enable the door to stay closed yet unlocked during an open door schedule. When the door is in a locked state, it is necessary to use the elbow switch to activate the swing door operator after successfully scanning an access card or tag.

### 3.5. Connecting the ST2020 Intercom

**NOTE:** Please note that these instructions are solely intended for connecting the ST2020 intercom to the ST2029 Door Central PoE+. For comprehensive instructions on how to install and configure the ST2020 intercom, please consult the installation manual for the ST2020.

#### 3.5.1. Cable revisions

In order to establish a connection between the ST2029 Door Central PoE+ and the ST2020 Intercom, you will need a CAT 6 (T568B) cable. However, it's important to note that the CAT6 cable is split on the intercom side. Therefore, it's essential to use the correct revision of the cable that comes with the ST2020 intercom to ensure compatibility and a reliable connection.

Please refer to the following revisions of the cable that might come with the ST2020 Intercom.

##### 3.5.1.1. CAT 6 T568B REV 1

**Brown/White:** This cable provides 12V of power to the intercom. It's important to note that the voltage level should not exceed 12V to avoid damaging the intercom.

**Brown:** This cable serves as the power ground (PWR\_GND) for the intercom. It helps ensure proper electrical grounding and reduce the risk of electrical shock.

**Blue:** This cable functions as the RS485A, which is a communication protocol used in serial communication systems. It allows the ST2029 PoE+ Door Central to communicate with the ST2020 Intercom.

**Blue/White:** This cable serves as the RS485B, which is the second communication wire in the RS485 protocol. It works in tandem with the RS485A wire to facilitate bidirectional communication between devices.



SA00201A Fig.015

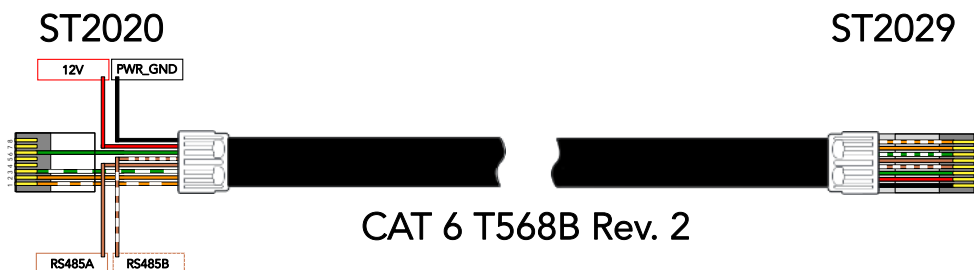
### 3.5.1.2. CAT 6 T568B REV 2

**Red:** This cable provides 12V of power to the intercom, ensuring that it runs reliably and efficiently. It's important to note that the voltage level should not exceed 12V to prevent potential damage to the device.

**Black:** This cable serves as the power ground (PWR\_GND) for the intercom. It ensures that the electrical current has a safe path to follow and reduces the risk of electrical shock.

**Brown:** This cable serves as the RS485A communication wire, a standard communication protocol used in serial communication systems. It facilitates reliable communication between the ST2029 PoE+ Door Central and the ST2020 Intercom.

**Brown/White:** This cable serves as the RS485B communication wire, which is the second communication wire in the RS485 protocol. It works in tandem with the RS485A wire to enable bidirectional communication between devices.



SA00201A Fig.016

### 3.5.1.3. CAT 6 T568B REV 3

Red: This cable provides 12V of power to the intercom, ensuring that it runs smoothly and reliably. It's crucial to avoid exceeding the 12V voltage level to prevent damage to the device.

Black: This cable functions as the power ground (PWR\_GND) for the intercom, providing a safe path for the electrical current to follow and reducing the risk of electrical shock.

Blue: This cable functions as the RS485A communication wire, which is a standard communication protocol used in serial communication systems. It allows the ST2029 PoE+ Door Central to communicate with the ST2020 Intercom.

Blue/White: This cable functions as the RS485B communication wire, which is the second communication wire in the RS485 protocol. It works in conjunction with the RS485A wire to enable bidirectional communication between devices.



SA00201A Fig.017

### 3.5.2. Connecting the ST2020 Intercom

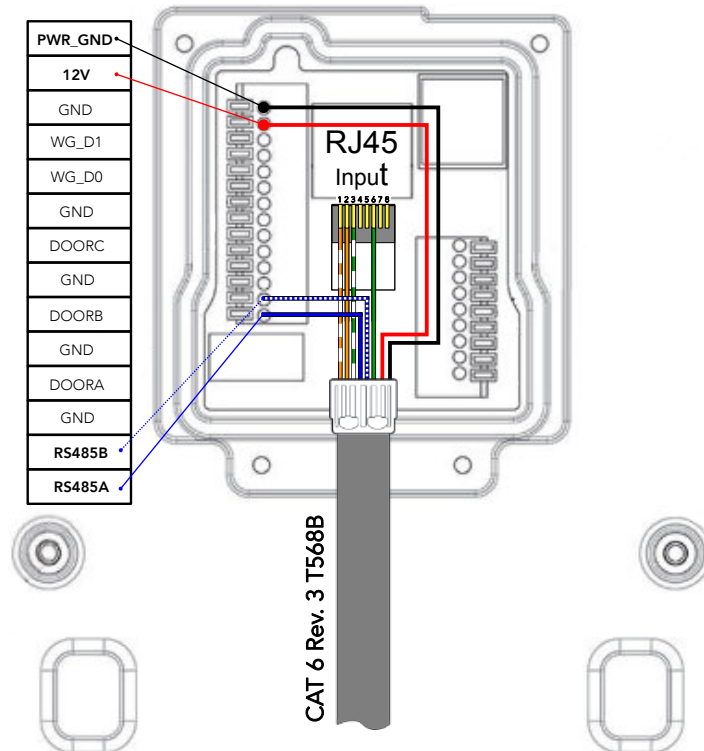
When connecting the ST2029 PoE+ Door Central to the ST2020 Intercom, it is important to understand that the CAT-cable needs to be split at the intercom side. This means that the cable's wires are separated into two groups, and each group connects to a different port on the intercom side panel at the back.

It is crucial to connect the split side of the cable correctly because doing so will ensure optimal performance and reliability of the system. The specific steps for connecting the cable will depend on the type of cable you have. Therefore, it is recommended that you refer to the cable revisions in the previous chapter to ensure that you connect the cable properly.

If you have terminated your own CAT6 cable, it is essential to use a network tester to check that you have communications on pins 1, 2, 3, and 6.

Pins 4, 5, 7, and 8 are split on the intercom side and cannot be tested. Pin 7 and Pin 8 are used for 12v power and PWR\_GND, respectively, while pins 4 and 5 are utilised for RS485 A and B communication. Incorrectly connecting these pins can lead to power issues or communication problems, which can cause the system to fail.

**NOTE:** It is essential to identify the correct revision of the CAT6 cable when connecting devices. Here is the wiring configuration for CAT6 cable revision 3. Please note that the illustration below applies to this specific revision only.



SA00201A Fig.018



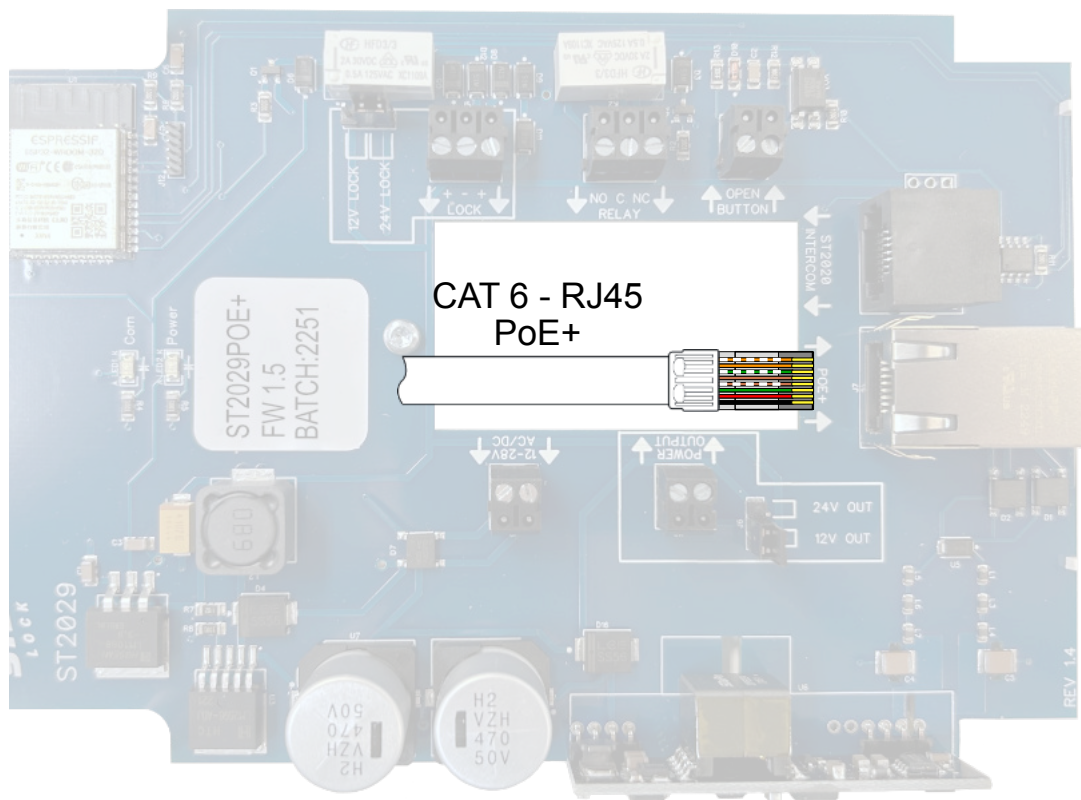
### 3.6. Powering ST2029

#### 3.6.1. Powering ST2029 using PoE+

**NOTE:** This guide assumes that a functional network infrastructure with a PoE+ enabled switch with an adequate power budget is already in place. Ensure that the PoE+ IEEE 802.3at standard is being used and that the switch port is properly configured. It's crucial to calculate your total power budget to ensure that you have enough voltage and amperage to meet your needs. Using PoE+ IEEE 802.3at you have only 30w available.

**IMPORTANT:** Carefully check the strapping pins on J6 and J11 before powering the ST2029 to ensure that the correct voltage is being supplied to the units connected to the ST2029.

Connect the CAT6 cable to the J7 PoE+ input on the PCB, which will power up both the ST2029 and ST2020 intercom.



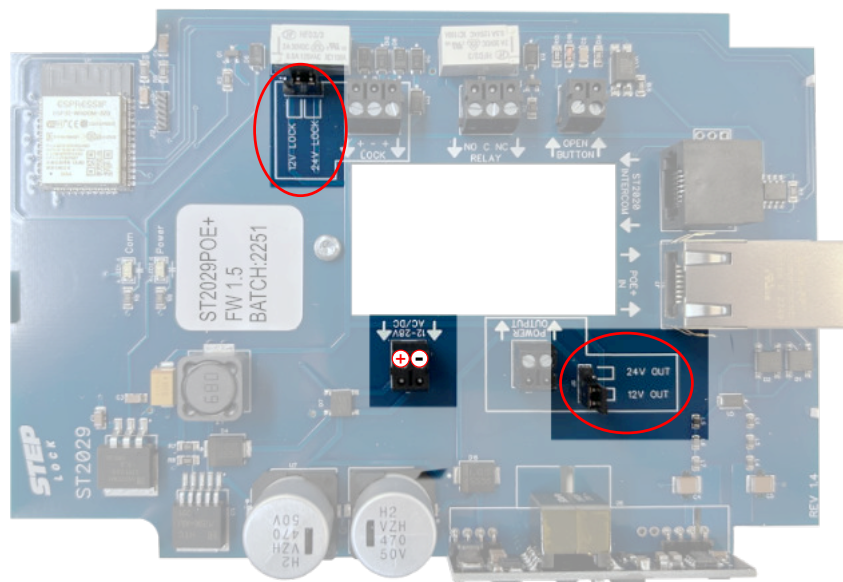
### 3.6.2. Powering ST2029 using J10 and external power source

The ST2029 intercom system offers flexibility in its power source, as it can be powered by an external power supply ranging from 12 volts to 28 volts. This broad range allows you to choose the most suitable and readily available power source for your specific needs, ensuring a smooth and reliable operation of the intercom system.

**IMPORTANT:** Take extra care to measure the total power budget on your setup and configuration. The ST2029 PoE+ uses 60mA at 24v and 100mA at 12v. The intercom uses 1000mA. It is recommended to use a balanced ripple-free power supply with a minimum capacity of 2 amperes.

When planning your power usage, don't forget to consider additional factors such as the electronic lock and whether you'll be using the J5 power output. It's crucial to calculate your total power budget to ensure that you have enough voltage and amperage to meet your needs.

You can set the positive (+) and negative (-) connections as per your preference, as the input is AC/DC and supports an input voltage range of 12 to 28 volts. Check the strapping pins on J6 and J11 before powering the ST2029, to ensure that you have correct voltage to the units connected to the ST2029.



## Contact

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Additional support at our [website](#).

