openpath

a Motorola Solutions Company

OPENPATH ACCESS CONTROL SYSTEM INSTALLATION GUIDE

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REVISIONS

Guide	Description
Rev. 2.5	Menu name updates in the Openpath Control Center Other updates: • Openpath Embedded USB Smart Reader support: FOR MORE INFORMATION on page 6, WIRING OPENPATH READERS on page 15 • European (EU) Partner Center Control Center: USING THE CONTROL CENTER on page 19, CREATE ACU on page 38, Change input types in the Control Center on page 29, Configure EOL in the Control Center on page 32, Configure Wiegand Devices in the Control Center on page 30, Provision the ACU with a laptop on page 40

TABLE OF CONTENTS

BEFORE YOU START

This installation guide explains how to install and configure Openpath Smart Hubs (ACUs) and Openpath Smart Readers as part of an Openpath Access Control system. This guide also includes information about Core Series Smart Hubs and first generation Smart Hubs. For more information, see APPENDIX: FIRST GEN SMART HUBS on page 43. For information on the Single Door Controller, refer to the OPENPATH ACCESS CONTROL SYSTEM INSTALLATION GUIDE.

CONDUCTING SITE SURVEYS

Before installing Openpath hardware, conduct a customer site survey to determine the following:

- How many entries need to be configured (e.g. doors, gates, and elevator floors)
- Whether you're using legacy wiring or new wiring
- What kind of electronic entry mechanisms, Request to Exit (REX) mechanisms, and door contact sensors will be used and their power requirements. If your locking hardware requires 24V, either use a Smart Hub with an .24V power supply or use a separate 24V supply.
- Whether you're providing backup batteries for the ACUs. See SELECTING A BACKUP BATTERY on page 7.
- Whether you're supporting a legacy access control panel for mobile gateway. See WIRING TO LEGACY PANELS AND MOBILE GATEWAY on page 27.

FOR MORE INFORMATION

- Openpath Access Control Core Datasheet
- Openpath 4-Port Board Datasheet
- Openpath 8-Port Board Datasheet
- Openpath 16 I/O Elevator Board Datasheet
- Openpath 24V 4 Door Smart Hub Datasheet
- Openpath 12/24V 4-Door Smart Hub Datasheet
- Openpath 12/24V 8-Door Smart Hub Datasheet
- Openpath 24V Elevator Smart Hub Datasheet
- Openpath Video Reader Pro Datasheet
- Openpath Smart Reader Datasheet
- Openpath Embedded USB Smart Reader Datasheet
- Openpath First Gen Smart Hub Datasheet
- OPENPATH ACCESS CONTROL USER GUIDE FOR ADMINISTRATOR WEB PORTAL
- OPENPATH SINGLE DOOR CONTROLLER INSTALLATION GUIDE
- LifeSafety Power® FPV Installation Guide
- LifeSafety Power B100 Installation Guide
- LifeSafety Power C4/C8 Installation Guide
- Openpath Embedded USB Smart Reader Installation Instructions (included in the box)

For additional product and support documentation, see support.openpath.com.

INSTALLATION

NETWORK REQUIREMENTS

An Ethernet connection with DHCP must be used to connect the ACU to the Local Area Network (LAN). You also need to configure firewall settings to communicate with the Openpath system, which uses the following outbound ports:

- TCP port 443
- UDP port 123

> **Note:** If using an external DNS server, the outbound UDP port 53 must also be open.

To support Wi-Fi unlocking from the mobile app, the inbound TCP port 443 of the ACU must be available from within the LAN. Inbound port forwarding on the router, firewall, or NAT device is not required.

The SDC also supports Wi-Fi connections. Refer to NETWORK SETTINGS on page 41.

SELECTING A BACKUP BATTERY

While not required, Openpath recommends having a backup battery in case of power outages. The size of battery depends on your setup and how long you want to power the system.

Table 1 Power requirements for Core Series Smart Hubs (24V)

Access Control Core	0.4A
4-Port Board	0.3A
Smart Reader	0.14A
Locking hardware (while engaged)	0.12A--0.25A

Assuming a 24V power supply, a Core Series Smart Hub configured with four Openpath Readers and locking hardware uses asc/bout 2 Amps. To keep the system running for 3 hours with all entries engaged, you need 2A x 3 hours = 6AH, so two 12V 6AH sealed lead acid (SLA) or gel cell batteries wired in series.

MOUNTING INSTRUCTIONS

Openpath Smart Hubs use LifeSafety Power E1 and E2 enclosures. Core Series Smart Hubs are shipped with power supplies pre-installed, but Openpath boards must be installed separately.

MOUNT THE ENCLOSURE TO THE WALL

1. (Optional) Remove the enclosure cover.
2. Locate the top keyhole mounting holes in the back of the enclosure.
3. Mark and pre-drill the locations for the keyholes in the mounting surface.
4. Partially install two fasteners appropriate for the surface on which the enclosure is being installed. Leave the heads of the fasteners approximately ¼" out from the surface. Minimum fastener size should be #10 or larger.
5. Hang the enclosure on the two fasteners and mark the locations of the remaining mounting holes.
6. Remove the enclosure and pre-drill the locations for the remaining mounting holes.
7. Re-hang the enclosure on the top mounting fasteners, install the remaining fasteners, and tighten all fasteners.
8. Reinstall the enclosure's cover, if removed in step 1.

INSTALLING CORE SERIES BOARDS IN E1 ENCLOSURE

1. Mount the 4-Port Board in the upper-corner of the enclosure by snapping board standoffs into the holes in the back of the enclosure.
2. Mount the Core Series Controller Board below the 4-Port Board, perpendicular to the back of the enclosure, by hooking tabs into the holes in the back of the enclosure.
3. Mount the 16 I/O Elevator Board (if included) below the Core Series Controller Board using 6-32 screws (insert screws from back of enclosure) with the USB port on the left.
4. Connect the Core Series Controller Board to the 4-Port Board with the included USB cable. Connect the Core Series Controller Board to the 16 I/O Elevator Board with the additional USB cable.

> **Note:** The maximum recommended USB cable length is 6 feet (2 meters) or 10 feet (3 meters) if high quality, shielded cable.

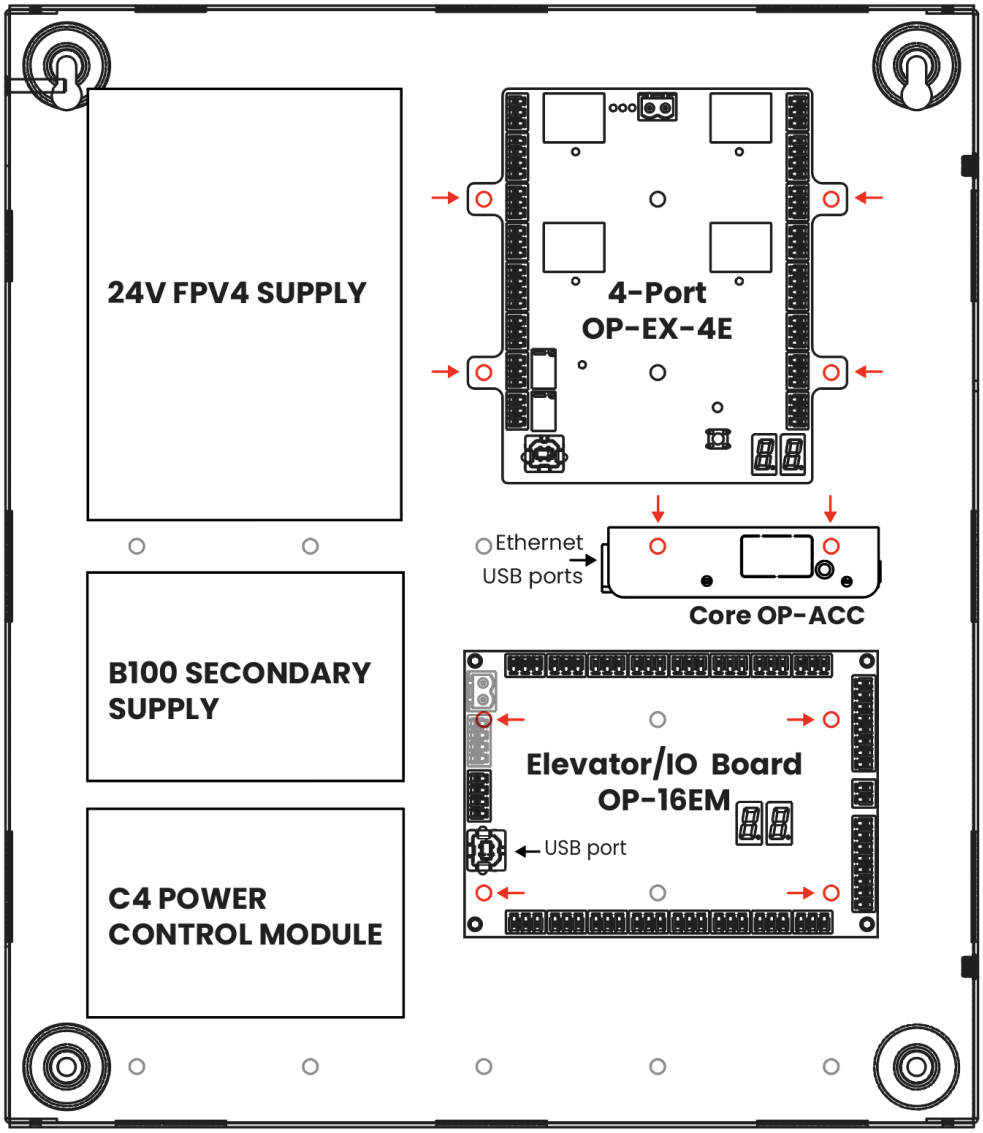

Figure 1 E1 Board Placement

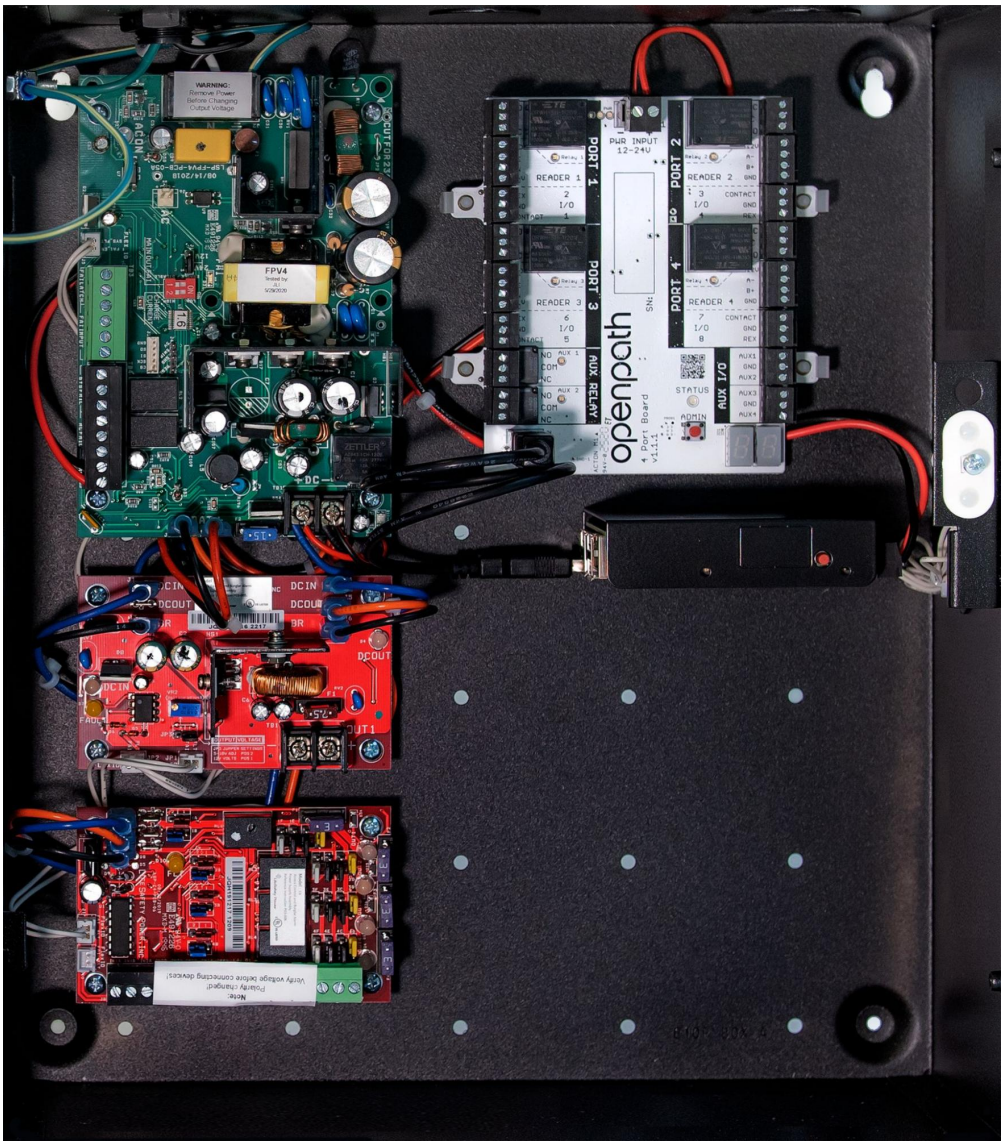

Figure 2 4ENT-SYS-1224V Board Placement

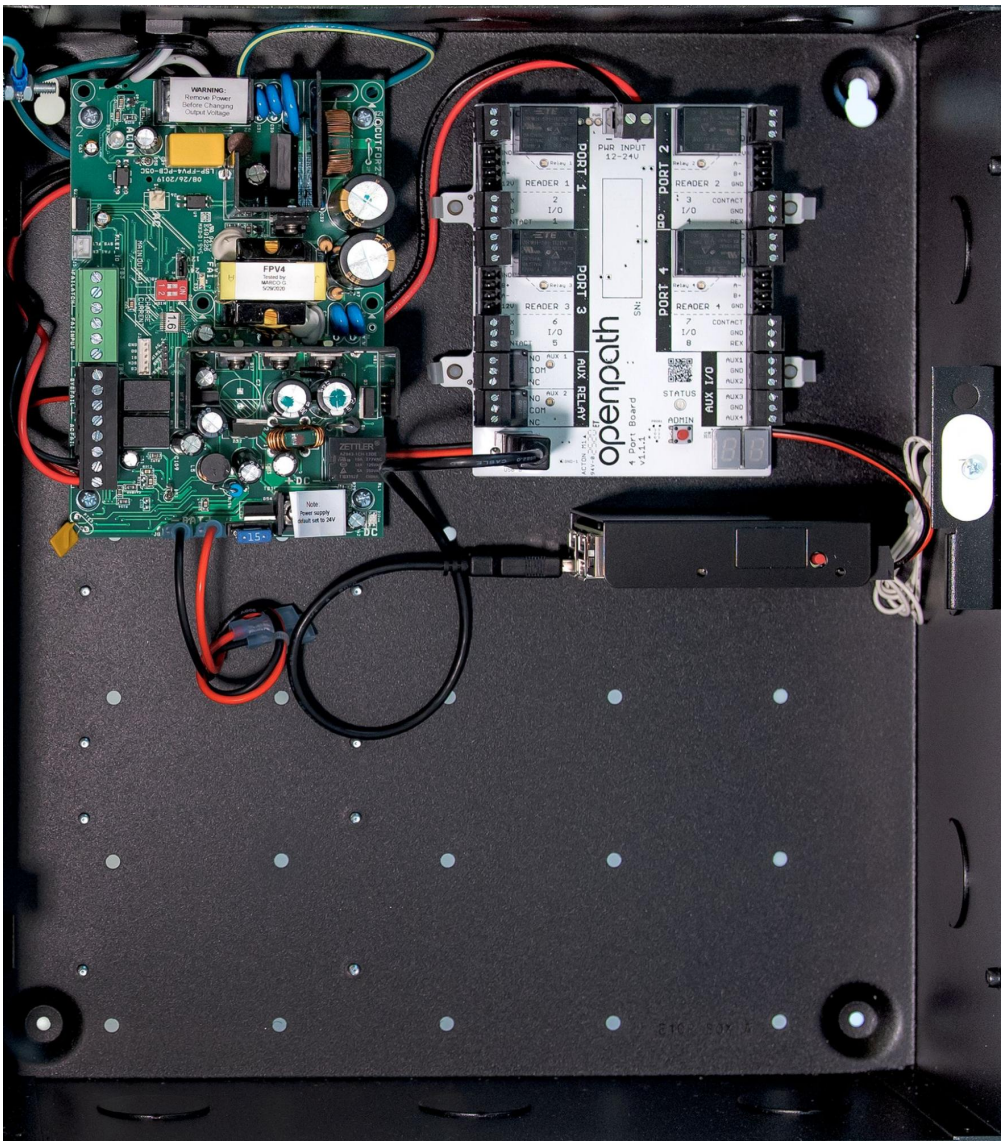

Figure 3 4ENT-SYS-24V Board Placement

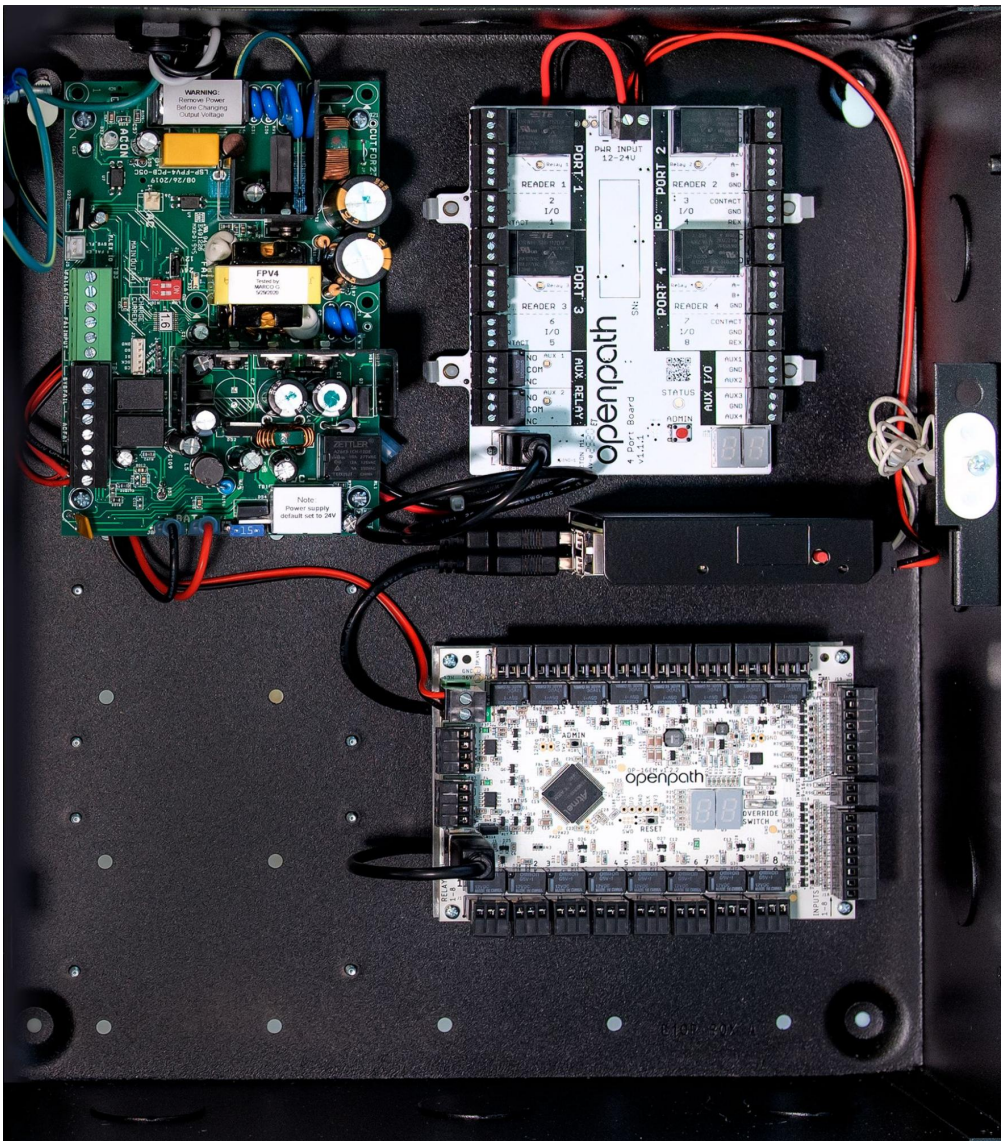

Figure 4 20ENT-SYS-24V Board Placement

INSTALLING CORE SERIES BOARDS IN E2 ENCLOSURE

1. Mount the 8-Port Board in the upper-right corner of the enclosure by snapping board standoffs into the holes in the back of the enclosure.
2. Mount the Core Series Controller Board with the USB and Ethernet ports facing up as shown in the diagram, and hook the tabs on into the holes in the enclosure and slide to the left to lock in place.
3. Connect the Core Series Controller Board to the 8-Port Board with the included USB cable.

Note: The maximum recommended USB cable length is 6 feet (2 meters) or 10 feet (3 meters) if high quality, shielded cable.

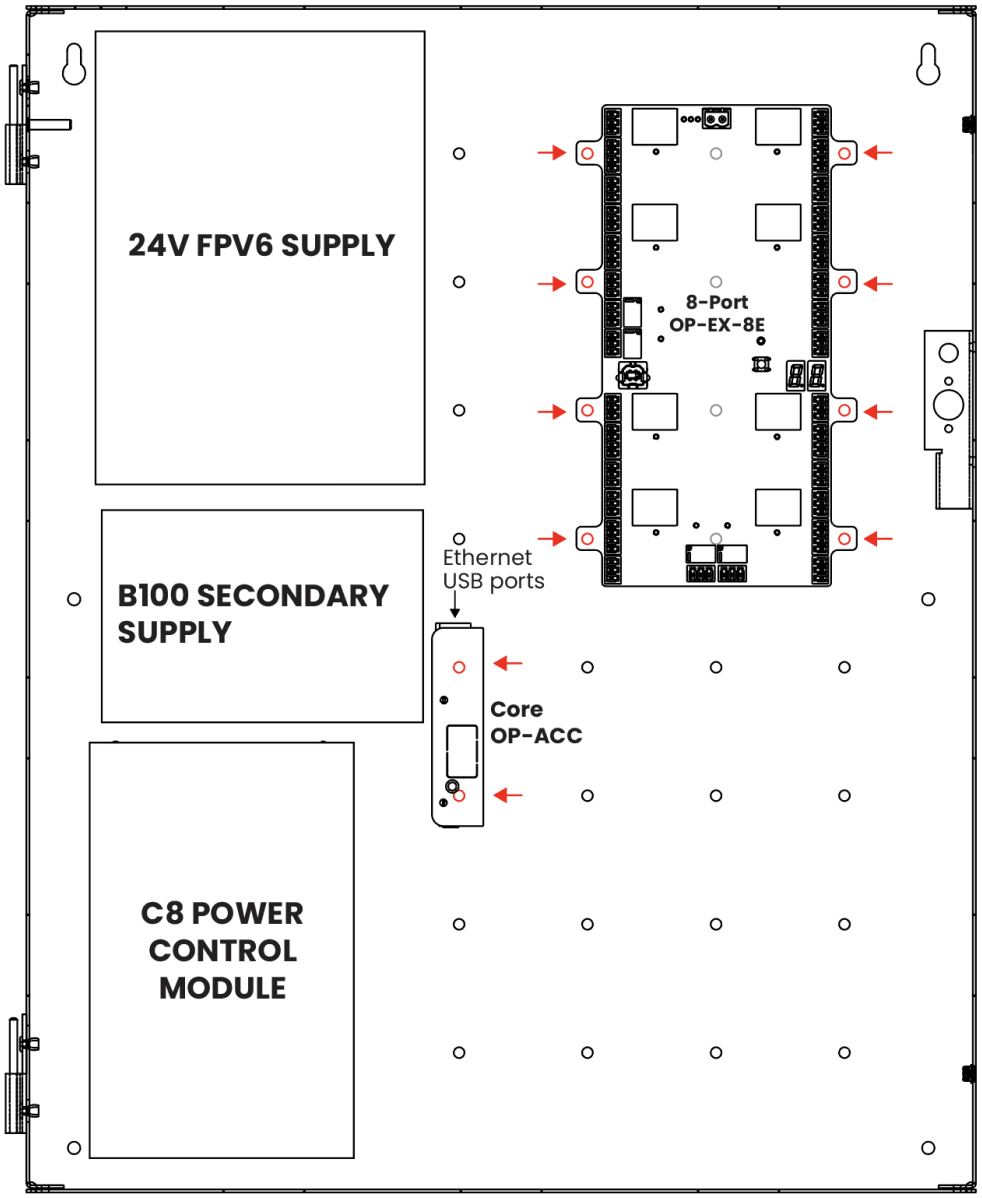

Figure 5 E2 Board Placement

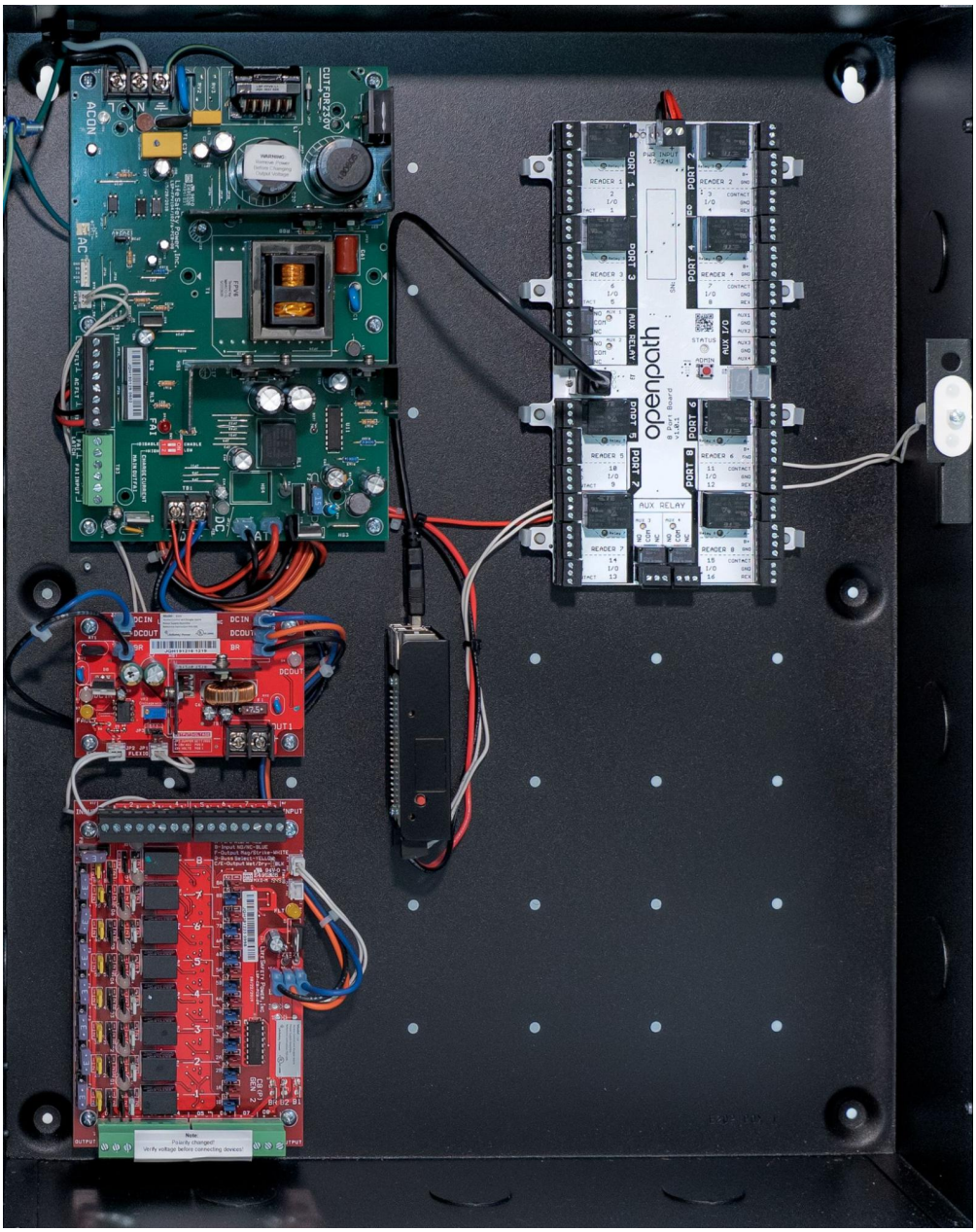

Figure 6 20ENT-SYS-24V Board Placement

WIRING OPENPATH READERS

Openpath Readers and ACUs communicate via RS-485. The following wire types are compatible, listed in the order of preference which impacts distance.

- Shielded CAT6A (recommended, additional two pairs can be used for sensors)
- Shielded CAT6
- Shielded RS485 w/22-24AWG (lower gauge, thicker wire is better)
- Shielded CAT5
- Unshielded CAT6
- Unshielded CAT5
- Shielded 22/6
- Unshielded 22/6

Ideally, use one twisted pair for GND and VIN (power) and one twisted pair for +B and -A (data).

> **Note:** The Openpath Embedded USB Smart Reader can be wired via RS-485, or connected using the micro USB port and the cable provided in the box. Only one method, RS-485 or micro USB port, can be used at the same time. For more information, see the Openpath Embedded USB Smart Reader Datasheet and the Openpath Embedded USB Smart Reader Installation Instructions (included in the box). The Openpath Embedded USB Smart Reader supports only Openpath Mifare or DESFire EV3 card credentials. Mobile credentials are not supported at this time.

WIRING INFORMATION

PIGTAIL color	Name (short)	Name (full)	
Gray	GND	Ground (RTN)	Primary ACU Connections
Blue	+B	RS485-B	
Violet	-A	RS485-A	
Orange	VIN	+12V IN	
Red	VO	Wiegand Voltage	Connections to 3rd Party Wiegand Reader
Black	GND	Wiegand RTN	
Green	WD0	Wiegand Data 0	
White	WD1	Wiegand Data 1	
Brown	LED	Wiegand LED	
Yellow	BUZZER	Wiegand Buzzer	

Recommended maximum cable length: 300 ft (91 m) with CAT6 or 500 ft (152 m) if two wire pairs are used for GND and VIN (power).

For shielded wiring: Connect one side of the drain wire (the shield around the wires) to the GND terminal on the ACU. Both the shield and the GND wire can share the same GND terminal. Do not connect the other side of the shield to anything.

For standard reader installation: We recommend that you install a 1-Gang 20 CU box in order to flush-mount the reader. Alternatively, the reader may also be surface mounted with the included back plate.

Note: For elevators, all relays and readers must be connected to the same ACU. If you need more than four access controlled floors or readers, add the Openpath Elevator Expansion Module.

WARNING: Always remove power from the ACU and locking hardware when wiring readers and other devices. Failure to do so can damage the ACU.

INSTALLING VIDEO READER PRO

Openpath Video Readers are powered using PoE and do not need to wire back to an Openpath ACU (however, you must use an ACU or third-party panel to support locking hardware).

PREREQUISITES

Create a Video Reader in the Control Center prior to installing and provisioning.

INSTALLATION

You can install the Video Reader Pro on a narrow surface using the mullion mount or on a single gang box using the standard mount.

INSTALL THE VIDEO READER PRO ON THE MULLION MOUNT

1. Use the provided screws (A) to attach the mounting plate (B) to the wall.
2. Place the cradle bracket (C) on the mounting plate, angle as desired, then secure with the provided screws (D).
3. Strip and connect the wires if necessary, then provision the device.
4. Snap in the reader (E), then secure with the security set screw (F).

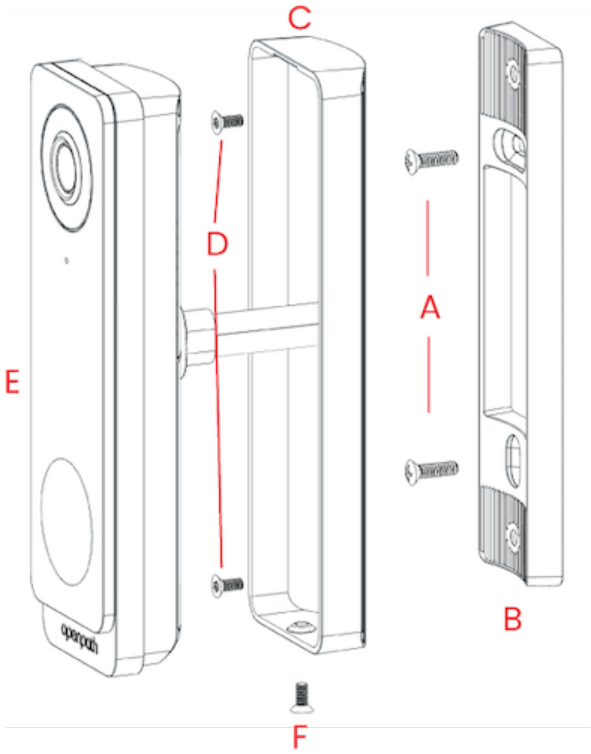

Figure 7 Installing the Video Reader Pro on the mullion mount

INSTALL THE VIDEO READER ON THE STANDARD MOUNT

1. Install a recessed single gang box into the wall.
2. Use the provided screws (A) to attach the mounting plate (B) to the wall.
3. Place the cradle bracket (C) on the mounting plate, angle as desired, then secure with the provided screws (D).
4. Strip and connect the wires, then provision the device.
5. Snap in the reader (E), then secure with the security set screw.

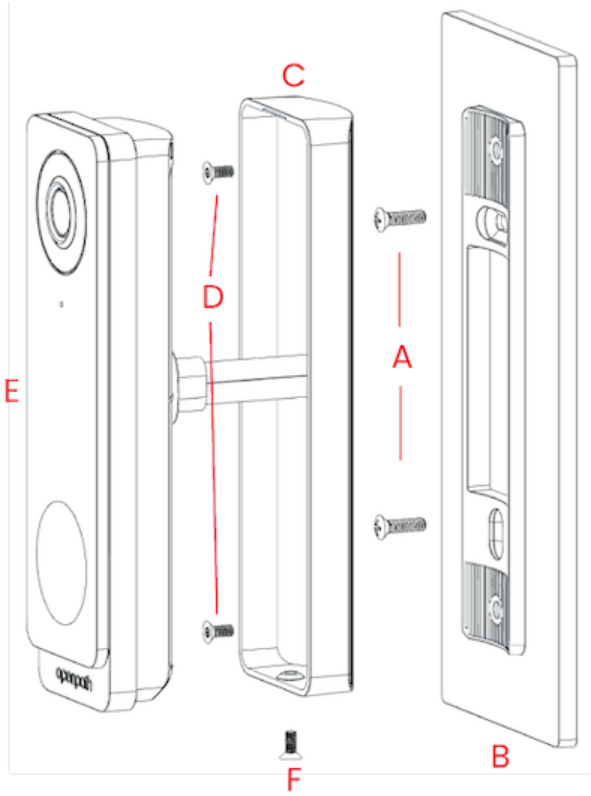

Figure 8 Installing the Video Reader Pro on the standard mount

WIRING THE VIDEO READER PRO

PIGTAIL color	Name	Description	Connection
Ethernet	--	RJ-45 connector	Openpath Cloud
Black	GND	Wiegand RTN	3rd Party Controller
Green	WD0	Wiegand Data 0	3rd Party Controller
White	WD1	Wiegand Data 1	3rd Party Controller
Blue/White Stripe	NO	Relay Normally Open*	3rd Party Sensor
Orange/White Stripe	COM	Relay Common*	3rd Party Sensor
Green/Yellow Stripe	GND	Ground (RTN)*	3rd Party Sensor

Figure 9 Video Reader Pro pigtail description

1. Using the provided weatherproof coupling, connect the RJ-45 jack to an Ethernet cable or PoE injector.
2. (Optional) Use the Blue/White (NO) and Orange/White (COM) stripe wires to connect to a third-party device like a REX or sounder.

3. (Optional) If connecting to a legacy access control system, connect the Green (WD0) and White (WD1) wires to an input on the legacy panel.

> **Note:** This step is required if setting up a Standalone Mode Video Reader. Refer to How to set up a Standalone Mode Video Reader Pro[1] for more information.

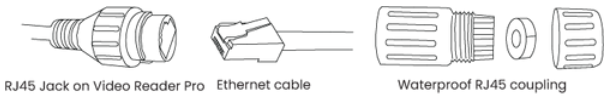

Figure 10 Weatherproof coupling diagram

*Relay not rated for locking hardware. To power locking hardware, use an Openpath Smart Hub or third-party access control panel.

PROVISIONING THE VIDEO READER PRO

Note: You must first create a Video Reader Pro in the Control Center before provisioning.

USING THE OPEN ADMIN APP

1. Open the Admin app.
2. Search for org name.
3. Press Admin button (Figure 11 on the next page) on back of Video Reader Pro.

> **Tip:** A SIM card removal tool is useful for this step.

4. Tap the serial number of Video Reader Pro in Admin app.
5. Tap **Provision** in the Admin app and follow in-app instructions.

USING THE CONTROL CENTER

1. Go to control.openpath.com/login and log in. To access the European Partner Center, go to control.eu.openpath.com/login.
2. Go to **Devices** > **Video readers**.

[1]See: https://support.openpath.com/how-to-set-up-a-standalone-mode-video-reader-pro-Sy7wcDjc5

3. Press Admin button (Figure 11 below) on back of Video Reader Pro.

> **Tip:** A SIM card removal tool is useful for this step.

4. In the Control Center, click the Register button.

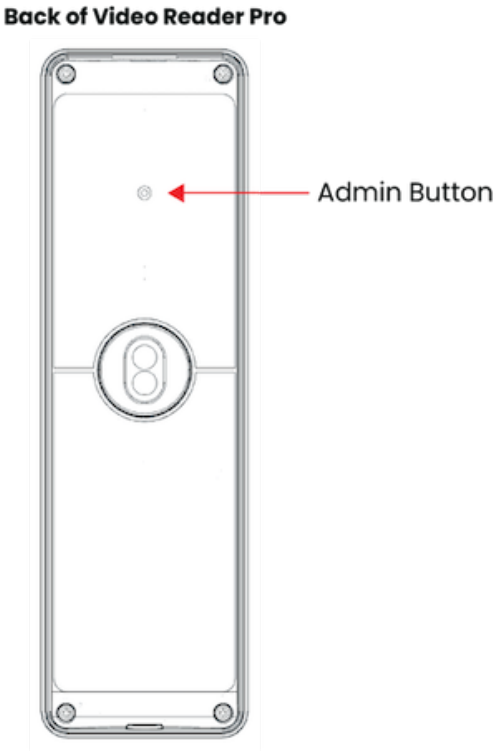

Figure 11 Video Reader Pro Admin button

VIDEO READER NETWORK SECURITY BEST PRACTICES

PoE access control readers, like the Video Reader Pro, require a wired network connection installed on the unsecured side of a door. To remove the risk of an attacker gaining access to the local network via the network connection if they're able to remove the reader from the wall, Openpath recommends that your IT team place the exposed Ethernet port on a demilitarized zone (DMZ) or perimeter network.

STANDARD CONFIGURATIONS

WIRING THE CORE SERIES 24V 4 DOOR SMART HUB

The Core Series 24V 4 Door Smart Hub (4ENT-SYS-24V) uses the LifeSafety Power® FPV4[1] to power the Core Series Controller Board and 4-Port Board.

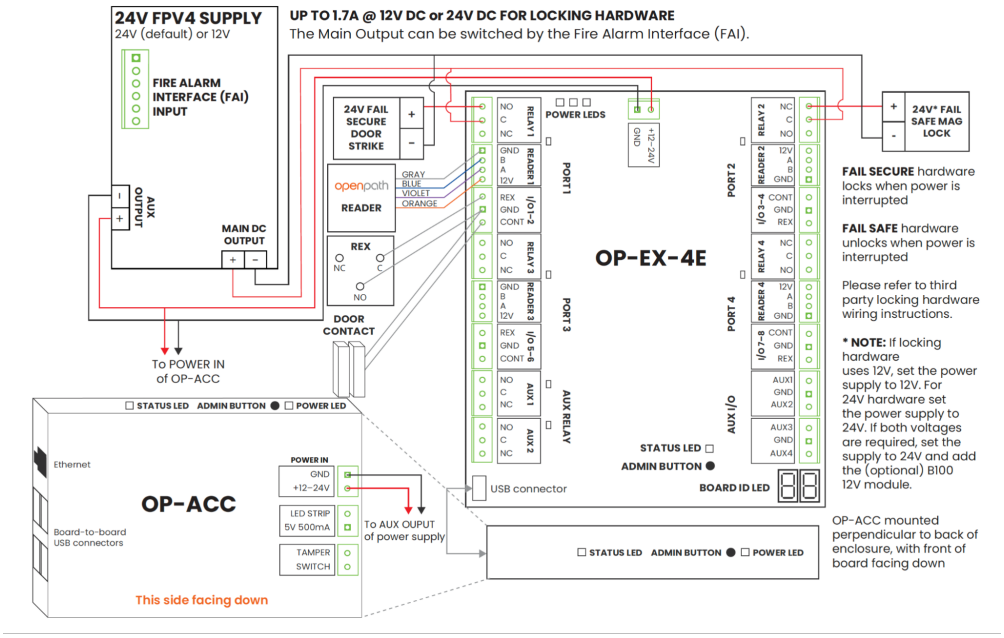

Figure 12 4ENT-SYS-24V Wiring Diagram

WIRING THE CORE SERIES 12/24V 4 DOOR SMART HUB

The Core Series 12/24V 4 Door Smart Hub (4ENT-SYS-1224V) uses the LifeSafety Power FPV4[2] to power the Core Series Controller Board and 4-Port Board; a LifeSafety Power B100[3] secondary power supply; and the LifeSafety Power C4 Control Module[4] to power 12-24V locking hardware.

[1]For more information, see https://www.lifesafetypower.com/docs/im_fpv-standard.pdf.
[2]For more information, see https://www.lifesafetypower.com/docs/im_fpv-standard.pdf.
[3]For more information, see https://lifesafetypower.com/docs/im_b100.pdf.
[4]For more information, see https://lifesafetypower.com/docs/im_c4c8.pdf.

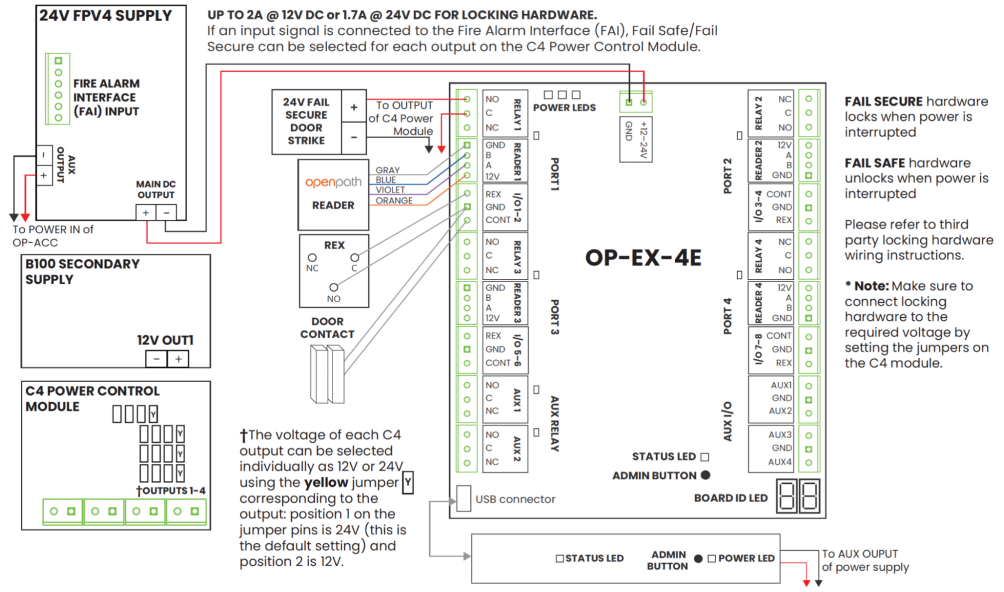

Figure 13 4ENT-SYS-1224V Wiring Diagram

WIRING THE CORE SERIES 24V ELEVATOR SMART HUB

The Core Series 24V Elevator Smart Hub (20ENT-SYS-24V) uses the LifeSafety Power FPV4[1] to power the Core Series Controller Board, 4-Port Board, and 16 I/O Elevator Board.

[1]For more information, see https://www.lifesafetypower.com/docs/im_fpv-standard.pdf.

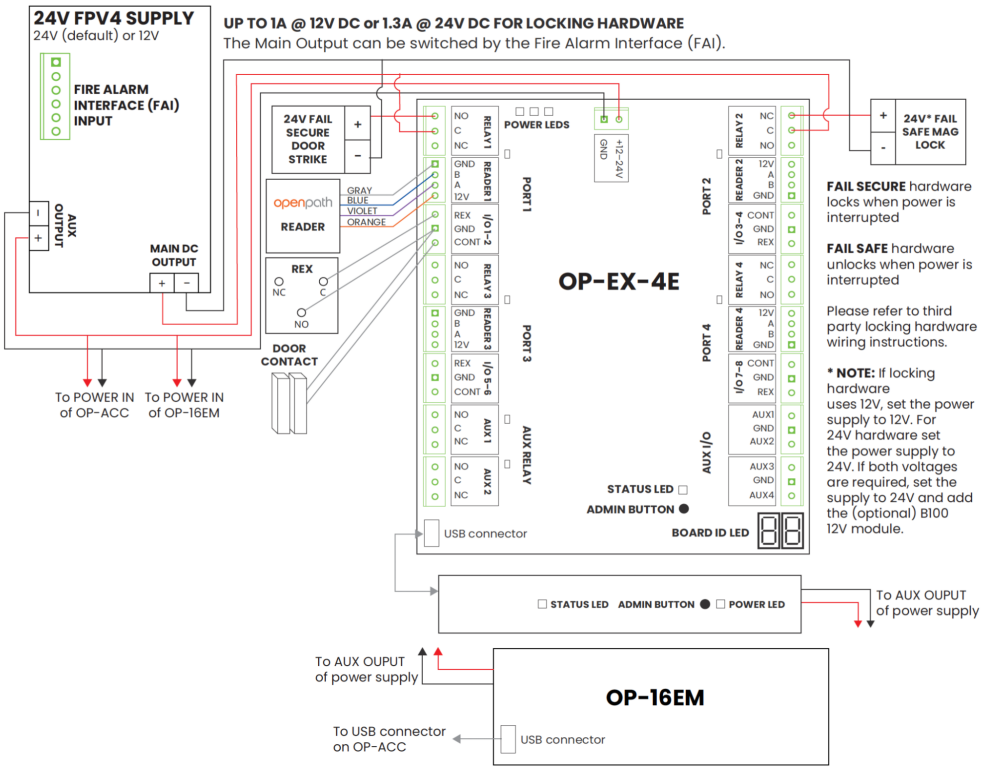

Figure 14 20ENT-SYS-24V Wiring Diagram

ELEVATOR BUTTON WIRING

Interrupt one of the signal wires from each button and run through the C and NC contacts for the corresponding relay on the 16 I/O Elevator Board.

GENERAL PURPOSE INPUTS

The general purpose inputs respond to voltages between 3V and 24V. The inputs will not respond directly to a switch or relay connection to ground. To use these inputs with a switch or relay, connect one side of the switch to the input and the other side of the switch to a supply voltage between 3V and 24V. If desired, you can add a 1k ohm resistor in series with the switch.

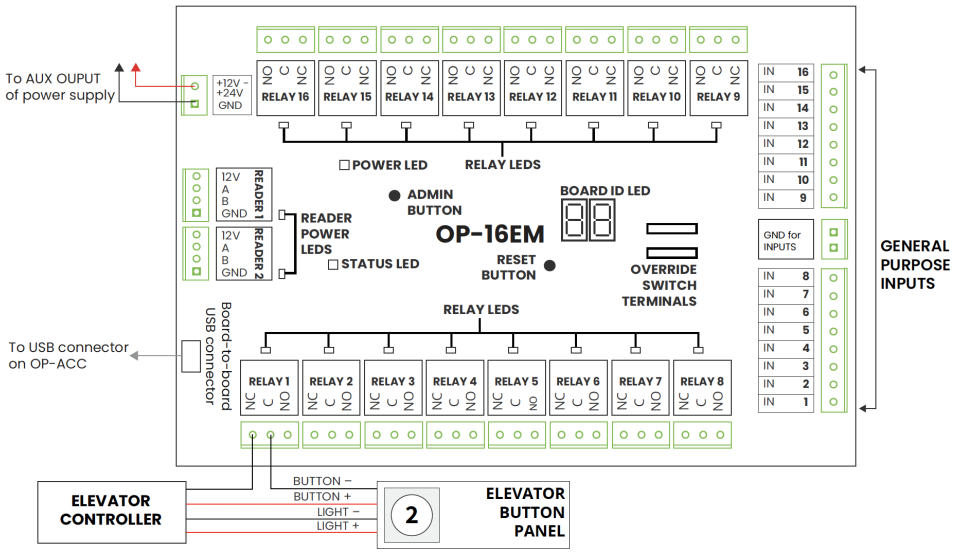

Figure 15 Elevator button wiring

WIRING THE CORE SERIES 12/24V 8-DOOR SMART HUB

The Core Series 12/24V 8-Door Smart Hub (8ENT-SYS-1224V) uses the LifeSafety Power FPV6[1] to power the Core Series Controller Board and 8-Port Board; a LifeSafety Power B100[2] secondary power supply; and the LifeSafety Power C8 Control Module[3] to power 12-24V locking hardware.

[1]For more information, see https://www.lifesafetypower.com/docs/im_fpv-standard.pdf.

[2]For more information, see https://www.lifesafetypower.com/docs/im_b100.pdf.

[3]For more information, see https://lifesafetypower.com/docs/im_c4c8.pdf.

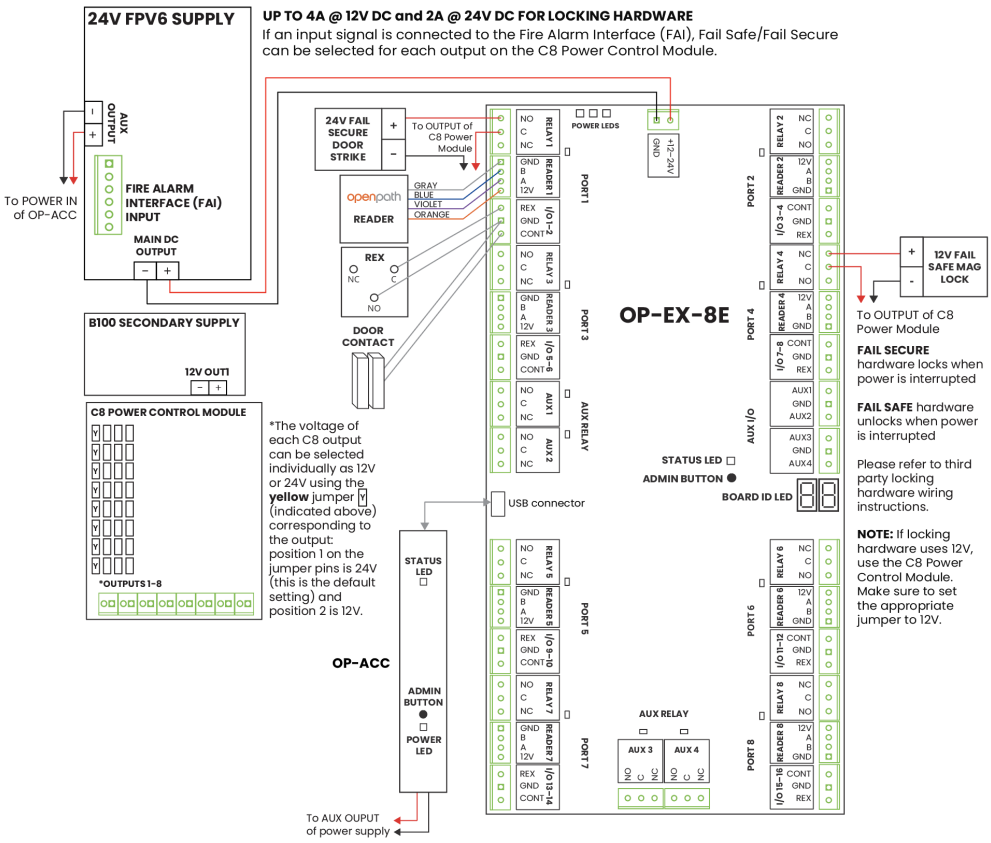

Figure 16 8ENT-SYS-1224V Wiring Diagram

WIRING THE REX WITH THE DOOR STRIKE

Except where required by fire or safety codes, for convenience you can wire the REX in parallel with the door strike on the same relay output.

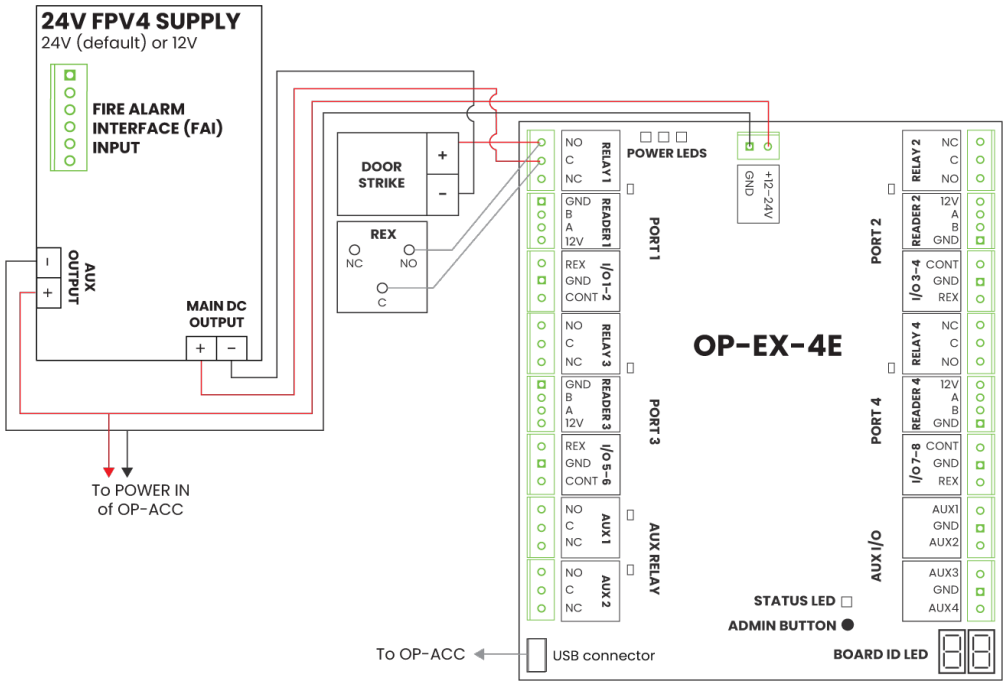

Figure 17 Wiring the REX with the door strike

WIRING THE REX TO THE ELECTROMAGNETIC LOCK

For safety-related applications, you must wire the REX directly to the electromagnetic lock.

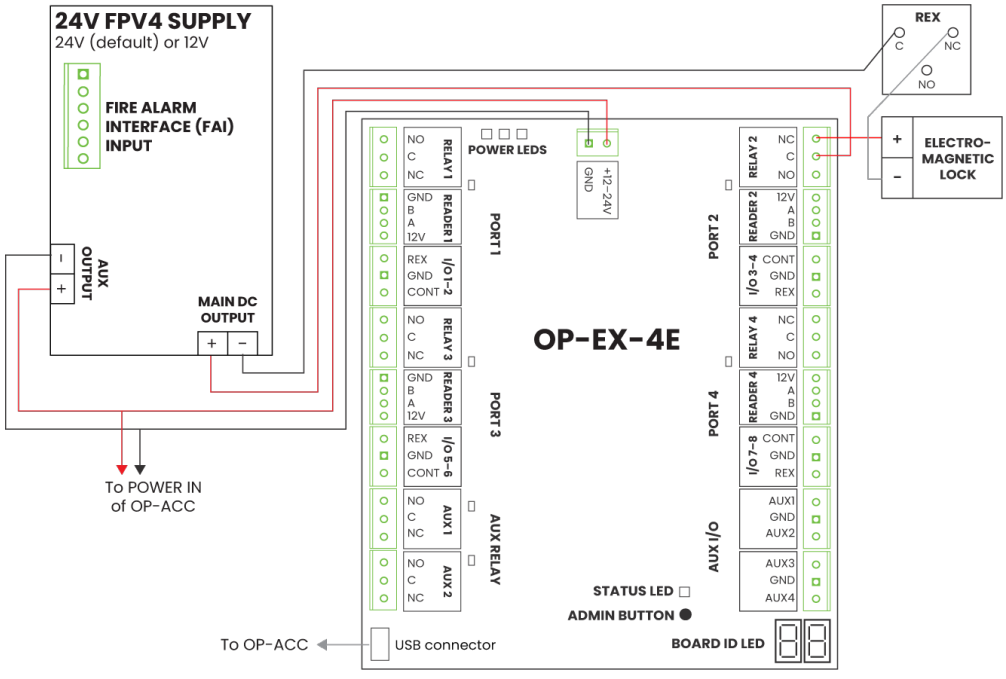

Figure 18 Wiring the REX to the Mag Lock

WIRING FAIL SAFE AND FAIL SECURE LOCKING HARDWARE

Fail safe and fail secure are ways of configuring locking hardware:

- **Fail safe** hardware **unlocks** when power is interrupted.
- **Fail secure** hardware **locks** when power is interrupted.

ADVANCED CONFIGURATIONS

WIRING WIEGAND READERS TO OPENPATH READERS

To support additional card credentials, biometric scanners, and PIN codes, you can wire third-party readers to the Openpath ACU by using the Smart Reader pigtail. Simply connect the power (red), ground (black), WD0 (green), and WD1 (white) from the Smart Reader pigtail to the Wiegand reader.

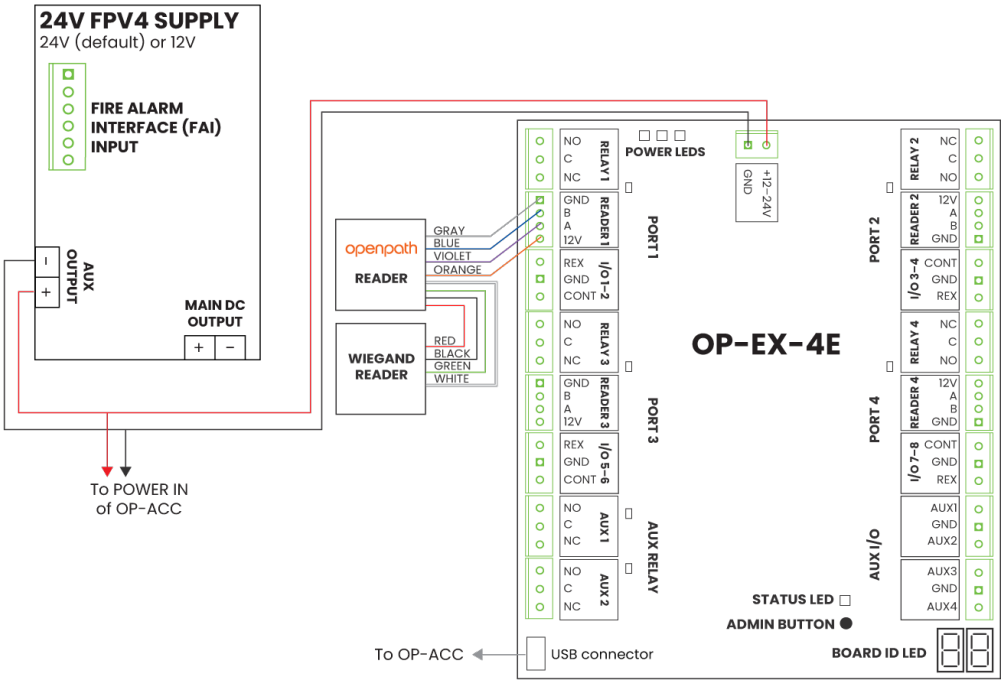

Figure 19 Wiring Wiegand Readers to Openpath Readers

WIRING TO LEGACY PANELS AND MOBILE GATEWAY

To add mobile credential features to a legacy access control system:

1. Install the Openpath ACU between the Openpath Readers and the legacy panel, with the CHANGING I/O TYPES on the next page of the ACU configured as output to the legacy panel (see Configure Wiegand Devices in the Control Center on page 30).

2. Replace low frequency (LF) Wiegand readers with LF Openpath Readers and high frequency (HF) Wiegand readers with HF Openpath Readers, or replace either with Smart Reader v2 which supports both.

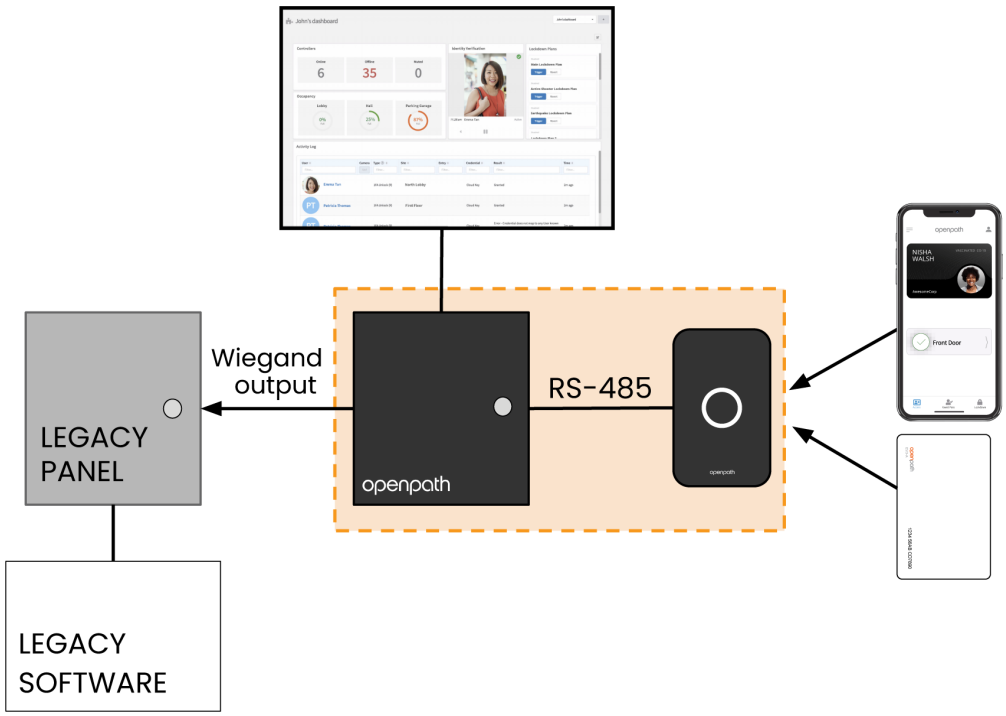

Figure 20 Wiring ACUs to Legacy Panels

In this configuration, the legacy panel controls all locking hardware and entry mechanisms while the Openpath system lets you use the Openpath mobile app, Smart Reader, and Wave to Unlock functionality. Refer to the OPENPATH ACCESS CONTROL USER GUIDE FOR ADMINISTRATOR WEB PORTAL for more information on configuring Mobile Gateway settings.

CHANGING I/O TYPES

While I/Os on the 4-Port Board and 8-Port Board are labeled REX and CONTACT by default, you can use these I/Os interchangeably or as generic inputs, by modifying their type in the Control Center. You can also change them to Wiegand inputs, which requires a few extra steps. For more information, see "CONFIGURING OPENPATH CONTROL CENTER WITH LEGACY SYSTEMS" in the OPENPATH ACCESS CONTROL USER GUIDE FOR ADMINISTRATOR WEB PORTAL.

CHANGE INPUT TYPES IN THE CONTROL CENTER

1. Go to control.openpath.com/login and log in. To access the European Partner Center, go to control.eu.openpath.com/login.
2. Go to **Devices** > **ACUs**, then click on the ACU to edit it.
3. Click on the **Ports** tab.
4. Click **Ports** next to the input you'd like to repurpose.
5. Select a different type from the **Input Type** dropdown, and click **Save**.

WIRING TO WIEGAND DEVICES ON CORE SERIES SMART HUBS

You can wire third party Wiegand readers and panels to the ACU to support integrations or in the case of Mobile Gateway. The extra Auxiliary I/Os on the 4-Port Board and 8-Port Board are helpful for wiring Wiegand Devices, however any I/O pair may be used (including Contact and REX inputs).

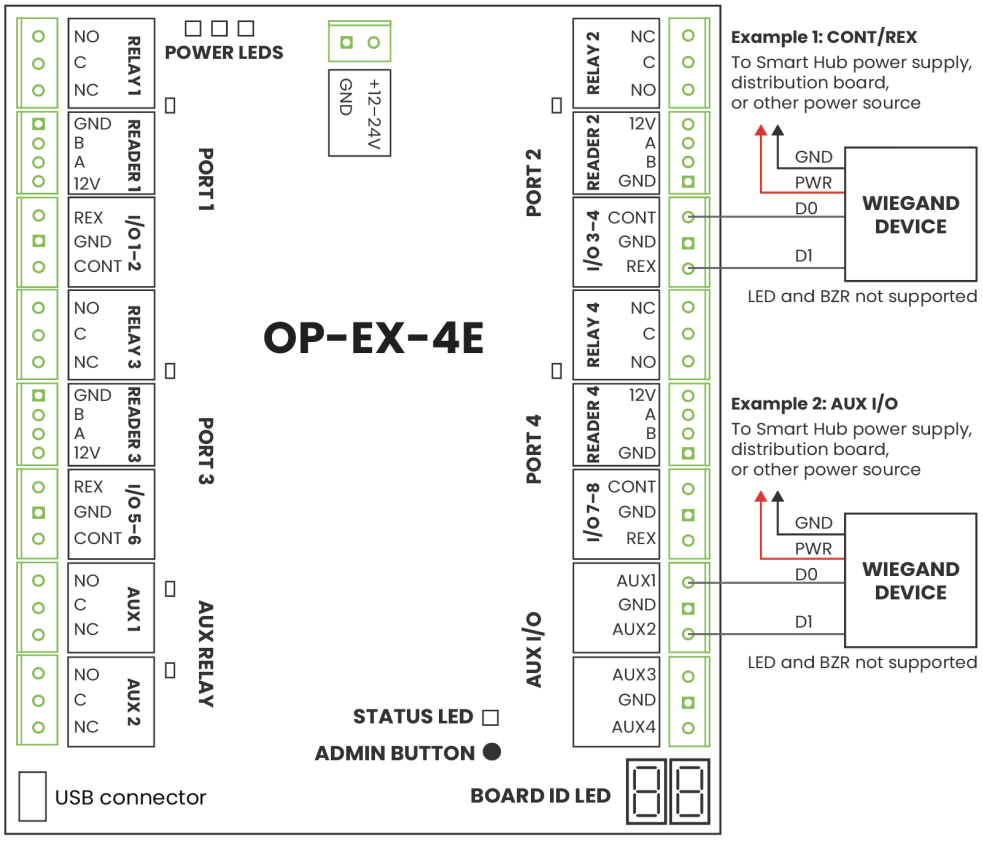

Figure 21 Wiring a Wiegand Device to a Core Series Smart Hub

CONFIGURE WIEGAND DEVICES IN THE CONTROL CENTER

1. Go to control.openpath.com/login and log in. To access the European Partner Center, go to control.eu.openpath.com/login.
2. Go to **Devices** > **ACUs**, then click on the ACU to edit it.
3. Click on the **Ports** tab.
4. Click **Port** next to the first input of the I/O pair with a Wiegand device configured. (in example 1, Contact2; in example 2, AUX1).
5. Select **Wiegand device** from **Input Type**, and click **Save**.

This will label the subsequent input as Wiegand Device (Extended) and disable it from editing. Inputs cannot be changed if they are already assigned to an entry.

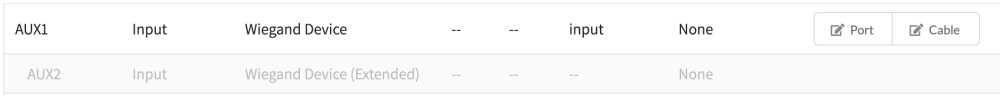

Figure 22 Input settings in the Control Center

Once the Wiegand Device is configured on the ACU, it can be assigned to an entry. Go to **Sites** > **Entries**, and create or edit an existing entry. In the Wiegand Device settings, configure the following:

- **Port** — Select the port for the Wiegand Device to which this Entry is wired.
- **Mode** — Select the Mode to set which direction the card credential data is sent:
  - Use **Input** to receive data from devices such as a Wiegand reader.
  - Use **Output (Gateway)** to send credential data to a third-party control panel.
    - Enable **Gateway Credential Pass-Through** if you do not want Openpath to authenticate credentials, but rather send all data to the legacy panel for authentication.
    - Enter a **Default Gateway Card Number** so that all credentials (including mobile credentials) are sent to the legacy panel as a Wiegand ID.

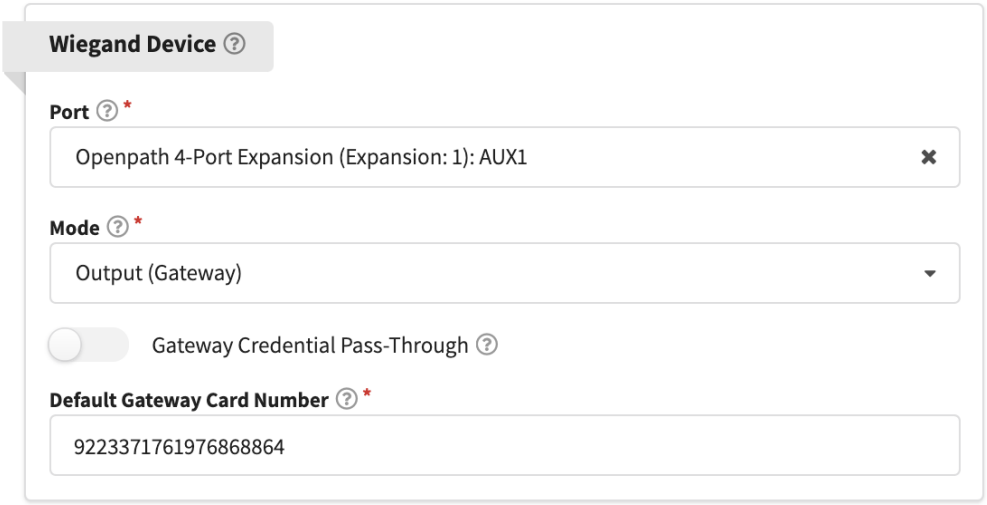

Figure 23 Assigning a Wiegand Device to an Entry

For more information on creating entries, refer to the OPENPATH ACCESS CONTROL USER GUIDE FOR ADMINISTRATOR WEB PORTAL.

END-OF-LINE SUPERVISION

The 4-Port Board and 8-Port Board inputs have support for user-installed single or double 1k ohm termination. This lets you monitor cut or shorted lines and create alerts and rules in the Control Center. The input settings in the Control Center must match the physical wiring configurations.

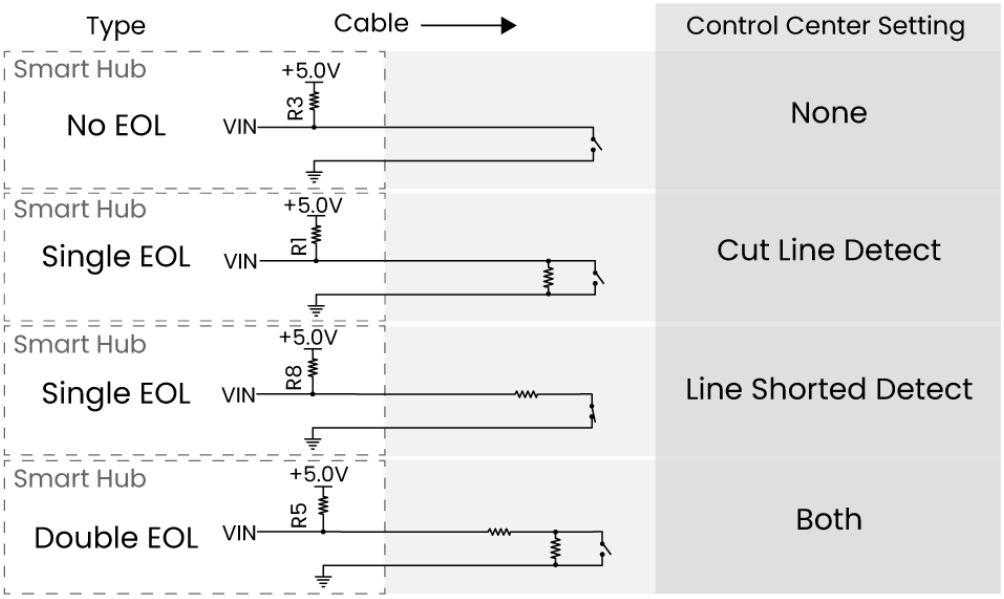

Figure 24 EOL configurations and settings

CONFIGURE EOL IN THE CONTROL CENTER

1. Go to control.openpath.com/login and log in. To access the European Partner Center, go to control.eu.openpath.com/login.
2. Go to **Devices** > **ACUs**, then click on the ACU to edit it.
3. Click the **Ports** tab.
4. Click **Cable** next to the port with EOL configured.
5. Select the appropriate **End of Line Supervision** setting from the dropdown, and click **Save**.

TROUBLESHOOTING

ACU LEDS

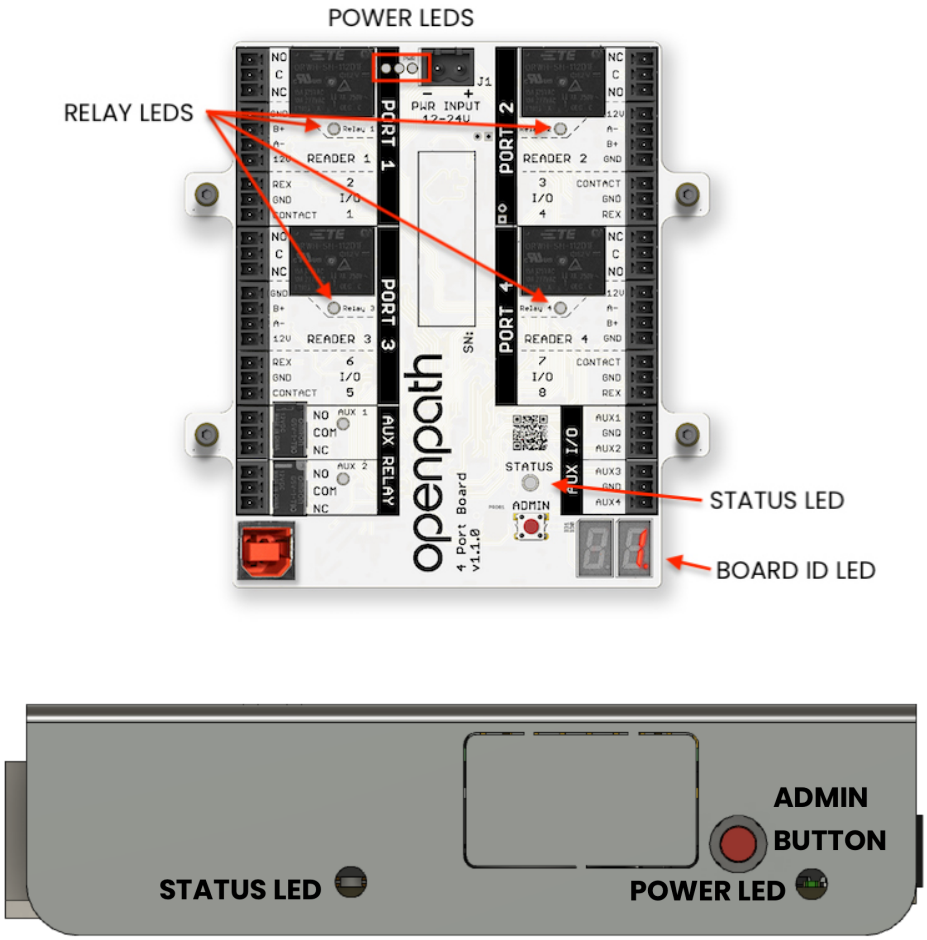

Figure 25 Expansion Board and Core LEDs

Openpath ACUs (Cores and Expansion Boards) have several LEDs that indicate the following:

- **POWER LEDs** indicate that the board is connected to power.
- **RELAY LEDs** indicate when the relays are activated.
- **STATUS LEDs** indicate that the ACU has been configured with firmware.
    - On the 4-Port Board and 8-Port Board, the STATUS LED is solid green when it is connected and communicating with the Core Series Controller Board, and solid red when there is a connection error.
    - If the STATUS LED is solid red, try the following:
        a. Power cycle the 4-Port Board or 8-Port Board.
        b. Unplug and replug the USB cable.

c. Restart the device in the Control Center.

> **Tip:** Go to **Devices** > **ACUs**, select the device, and choose **Restart Device Communicator** from the Action column.

- The STATUS LED on the Core Series Controller Board has several states, see CORE STATUS LED below.

- **BOARD ID LEDs** match the Expansion Board Number in the Control Center.

CORE STATUS LED

The Core STATUS LED indicates the following:

- **Solid Green** indicates the Core is provisioned and functioning normally.
- **Blinking Red** indicates a problem with the Internet connection.
- **Solid Cyan** appears when the Core is booting.
- **Solid Yellow** indicates that the Core is restoring software; appears when you power on the Core for the first time.
- **Blinking Yellow** indicates that the Core is updating software; appears when the Core has been online for less than 24 hours.
- **Solid Blue** indicates that the Core has finished booting and is ready for provisioning.
- **Solid Purple** indicates that the Core is connected to the Open Admin app.
- **Blinking Purple** indicates the Core is ready to connect to the Open Admin app.
- **Solid Red** indicates the Core is in an error state. Go to the Devices dashboard in the Control Center for more information.

Solid Green	Normal operation
Blinking Red	No Internet
Solid Cyan	Booting
Solid Yellow	Restoring software
Blinking Yellow	Updating software
Solid Blue	Unprovisioned state
Solid Purple	Connected to app
Blinking Purple	Ready to connect to app
Solid Red	Error, see Control Center

Figure 26 Core Status LED Definitions

READER LEDS

The Openpath Smart Reader LEDs indicate the following:

	Center dot is solid white.	Door is locked.
	Outer ring is solid white.	Door is unlocked.
	Center dot quickly switches between multiple colors and outer ring quickly spins once.	Reader has just received power.
	All lights are off.	Reader is not connected to power (check to see if power wires are swapped).
	Center dot is flashing red.	Reader is connected to power but cannot communicate with the ACU (check to see if the +B blue and -A violet lines are swapped).

	Center dot is solid blue.	Reader is connected to power and can communicate with the ACU, but has not been configured as an entry in the Control Center.
	Center dot is solid green and the outer ring is solid.	Reader has been identified via the Control Center.
	Center dot is solid purple and the outer ring is solid white.	Reader is possibly not receiving enough voltage or current, potentially due to a break in wiring. Try connecting the reader directly to the ACU, bypassing any wire runs.
	Center dot is solid pink and the outer ring is solid white.	Check that +12V IN (orange) hasn't been swapped with +B (blue) or -A (violet).

LEGACY WIRING

Sometimes legacy wiring (unshielded and straight through, rather than shielded twisted pair, often 22-6) results in slower connections and dropped packets between the Openpath Reader and ACU. To remedy this, you can switch GND and VIN with +B and -A connections on the ACU and readers to ensure the data pair (+B and -A) are using the alternate pair of legacy wires.

RESETTING THE ACU

SOFT RESET

To soft reset the ACU, disconnect power from the ACU, wait 10 seconds, then reconnect the power.

HARD RESET

WARNING: Only hard reset the ACU if absolutely necessary and if instructed by Openpath. This will clear all of the data off of the ACU and will require reprovisioning.

1. Disconnect power from the ACU.
2. Press the ADMIN button for 15 seconds .
3. While still pressing the ADMIN button, reconnect the power, and continue to hold the button for another 15 seconds, then release.
4. Wait 15 minutes or until the Status LED turns blue before PROVISIONING THE ACU below.

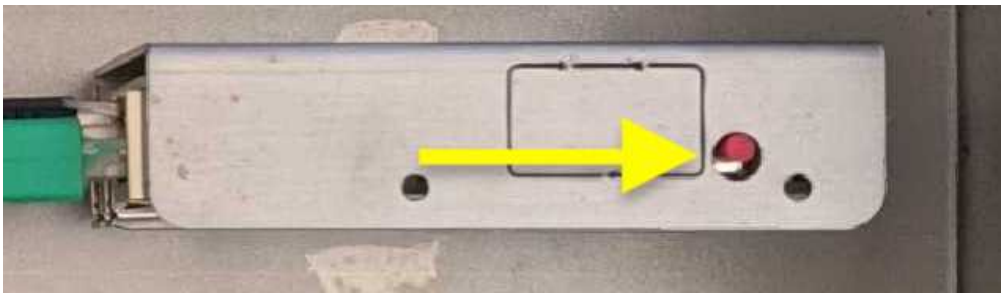

Figure 27 ADMIN button on Core

PROVISIONING THE ACU

Provisioning the ACU means registering it in the Openpath Control Center and getting it up and running with the latest firmware. You will need to re-provision in the case of RESETTING THE ACU on the previous page.

> **Note:** If you're provisioning ACUs for a customer account, the customer org needs to be created first.

REQUIREMENTS

- Meet all NETWORK REQUIREMENTS on page 7.
- Connect the ACU to the Internet via Ethernet.
- Install the Open Admin app.
  - iOS App Store
  - Google Play™ Store
- If using a laptop instead of the app, the laptop must be on the same network as the ACU. If you have a VLAN, make sure the laptop is on the same VLAN as the ACU.
- If using a laptop running Microsoft™ Windows or Linux®, you must download the iTunes app. The provisioning process uses Bonjour software that comes with

Linux® is the registered trademark of Linus Torvalds in the U.S. and other countries.

iTunes. Optionally, you can download iTunes and use an archive utility to extract and install only the Bonjour MSI.

CREATE ACU

Before you can provision an ACU using the Open Admin app, you must first create an ACU in the Control Center.

ADD MULTIPLE ACUS USING QUICK START OPTION

1. Go to control.openpath.com/login and log in. To access the European Partner Center, go to control.eu.openpath.com/login.
2. Go to **Administration** > **Quick start**.
3. Enter a **Site Name** and any other relevant site information.
    a. In **Organization Language**, select the preferred language for the emails sent by the system.
    b. Click **Next**.
4. Enter the number of controllers located at your site:
    a. Enter names for the controllers.
    b. In **Controller Type**, select the type used:
        - **First Generation - Red Board (OP-AS-01)** — For first generation Smart Hubs.
        - **Single Door Controller (SDC)**
        - **Core Series ACU** — For Core Series Smart Hubs.
    c. If your ACU also connects to an expansion board, add the appropriate types in **EXPANSION BOARDS**:
        - **Openpath 4-Port Expansion**
        - **Openpath 8-Port Expansion**
        - **Openpath 16-Port Elevator**

    > **Tip:** This configuration is most common with the Core Series Smart Hubs.

    d. Click **Next**.
5. Enter the number of readers connected to the controllers. Enter their names and click **Next**.
6. Review your site details and click **Confirm & Submit**. It may take a few minutes for setup to complete.

ADD ONE ACU

1. Go to **Devices** > **ACUs**.
2. To add a new ACU, click the Add ACU button in the upper-right corner.
3. Enter a name for the ACU.
4. In **Controller Type**, select the type used:
   - **First Generation - Red Board (OP-AS-01)** — For first generation Smart Hubs.
   - **Single Door Controller (SDC)**
   - **Core Series ACU** — For Core Series Smart Hubs.
5. If your ACU also connects to an expansion board, add the appropriate types in **EXPANSION BOARDS**:
   - **Openpath 4-Port Expansion**
   - **Openpath 8-Port Expansion**
   - **Openpath 16-Port Elevator**

> **Tip:** This configuration is most common with the Core Series Smart Hubs.

6. Click **Save**.

Figure 28 Create ACU

PROVISIONING STEPS

PROVISION THE ACU WITH THE OPEN ADMIN APP (RECOMMENDED)

1. Log in to the Open Admin app with your Control Center credentials.
2. Locate the org to which you're provisioning hardware, either on the list or using search, then tap on the org name.
3. Press the Admin button on the Controller Board or Core Series Controller Board.
4. In the Open Admin app, tap on the last four digits of the serial number for the ACU.
5. Tap **Test Internet Connection** and wait for a green YES to appear before proceeding with the next step.

> **Note:** This checks if the ACU/SDC can ping https://api.openpath.com/health.

6. Tap **Provision Device**.
7. Tap on the ACU Name that you want to provision to (this is the name of the ACU you created in the Control Center), then tap **Yes** to proceed.
8. The app will send notifications when ACU provision state changes from **Unprovisioned** to **Provisioning in progress** to **Provisioning complete**.

> **Note:** ACU will disconnect from the Open Admin app 5 minutes after first pressing the Admin button.

PROVISION THE ACU WITH A LAPTOP

1. Go to control.openpath.com/login and log in. To access the European Partner Center, go to control.eu.openpath.com/login.

> **Note:** The laptop must be connected to the same network as the ACU.

2. Go to **Devices** > **ACUs**.
3. Locate your ACU on the list.
4. If you don't see your ACU listed, create a new one:
    a. Click **Add ACU** and enter a name.
    b. Click on the **Controller Type** dropdown, select the appropriate type, and add any expansion boards if necessary.
    c. Click **Save**.
5. On the ACU, press the ADMIN button.

6. In the Control Center, click the **Register** button (lightning icon) next to the name of your ACU.
7. Click **Yes** to proceed.
8. A new window will open, click **Provision**.
9. If you see a "This Site Cannot be Reached" error, you need to ping the ACU using the command line:
    a. Open a command prompt and run:
        i. On Windows: `ping oppi.local`
        ii. On Mac or Linux: `ping -c4 oppi.local`
            - If nothing returns, check your network requirements. See NETWORK REQUIREMENTS on page 7.
    b. You should see the ACU's IP address (either in IPv4 or IPv6 format). Copy the address and return to the error page.
    c. In the URL, delete everything before :8080
        i. If using an IPv4 address, paste before :8080. For example: `192.0.2.0:8080`
        ii. If using an IPv6 address, delete the last two digits and the percentage sign, put square brackets outside the address, and paste before :8080.
            - **Correct:** `a123::b456:5a18:eb8f:7fd6:8080`
            - **Incorrect:** `a123::b456:5a18:eb8f:7fd6%29:8080`
        iii. Press **Enter**, then click the **Provision** button.
        iv. If the Provision button still doesn't appear, contact Openpath Support at (844) 673-6728 Ext 2 or support@openpath.com.

TEST INTERNET CONNECTION

In the Open Admin app, you can tap **Test Internet Connection** to check if the ACU can ping https://api.openpath.com/health.

NETWORK SETTINGS

In the Open Admin app, you can configure network settings for the ACU. While wired Internet connections are preferred, you can configure the Core to use Wi-Fi instead. The default interface for the Core is Ethernet/wired connection. Ethernet and Wi-Fi connections can be DHCP (default) or can have a static IP address.

The Core supports 2.4 GHz and 5 GHz Wi-Fi connections.

CHANGE NETWORK SETTINGS

1. Connect to the Core by pressing the Admin button again, if needed.
2. Connect to the SDC by pressing the Admin button again, if needed.
3. Tap on **Network Settings**.
4. Select **Configure network manually**.
5. Configure the network settings as needed. Set a static IP address or set a preferred DNS server.
6. Tap **Save** on the top-right corner.

SET UP WI-FI ON THE CORE

1. Connect to the Core by pressing the Admin button again, if needed.
2. Tap on **Network Settings**.
3. Tap on **Wi-Fi IP Settings**.
4. Enable **Default Interface**.
5. Tap on **Pick Wi-Fi Network**.
6. Choose your network and enter your password, then tap **Connect**.

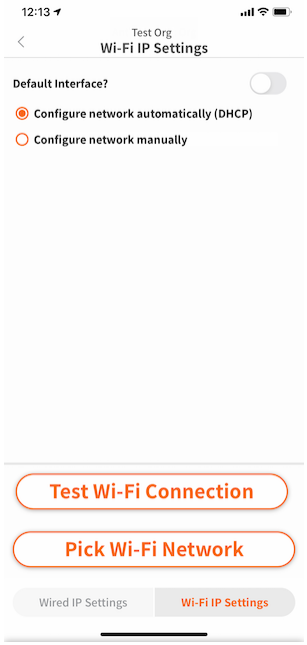

Figure 29 Admin App Wi-Fi Settings

APPENDIX: FIRST GEN SMART HUBS

Openpath first-generation hardware includes the 4 Door Controller (OP-4ECTR), 12V Smart Hub (OP-SH-12V), and 24V Smart Hub (OP-SH-24V).

SELECTING A BACKUP BATTERY

Table 2 Power requirements for first gen Smart Hubs (12V)

4 Door Controller	1A
Smart Reader	0.25A
Locking hardware (while engaged)	0.25A--0.5A

Assuming a 12V power supply, a Smart Hub configured with four Openpath Readers and locking hardware uses 4 Amps. To keep the system running for 3 hours with all entries engaged, you need 4A x 3 hours = 12AH, so a 12V 12AH sealed lead acid (SLA) or gel cell battery.

Note: The 12V Smart Hub (OP-4ESH-12V) supports up to 2A for 12V locking hardware.

INSTALLING 4 DOOR CONTROLLER WITH 24V LOCKING HARDWARE

For a UL Listed System, the standalone Controller Board must be mounted in a LifeSafety Power E1 enclosure with an FPV4 power supply.

WARNING: Only connect the Controller Board to 12V. Over voltage can damage the board.

If you purchased the Controller Board separately and are using 24V locking hardware, we recommend using the LifeSafety Power E1 enclosure, FPV4 power supply, B100 secondary power supply, and C4 power control module.

1. Follow all LifeSafety Power instructions for installing the FPV4, B100, and C4 in the enclosure.
2. Mount the Controller Board using the provided back plate.
3. Connect the B100 secondary supply to the Controller Board.

IMPORTANT: Verify that the jumper on the B100 is set to 12V.

4. Mount the enclosure according to MOUNTING INSTRUCTIONS on page 8.

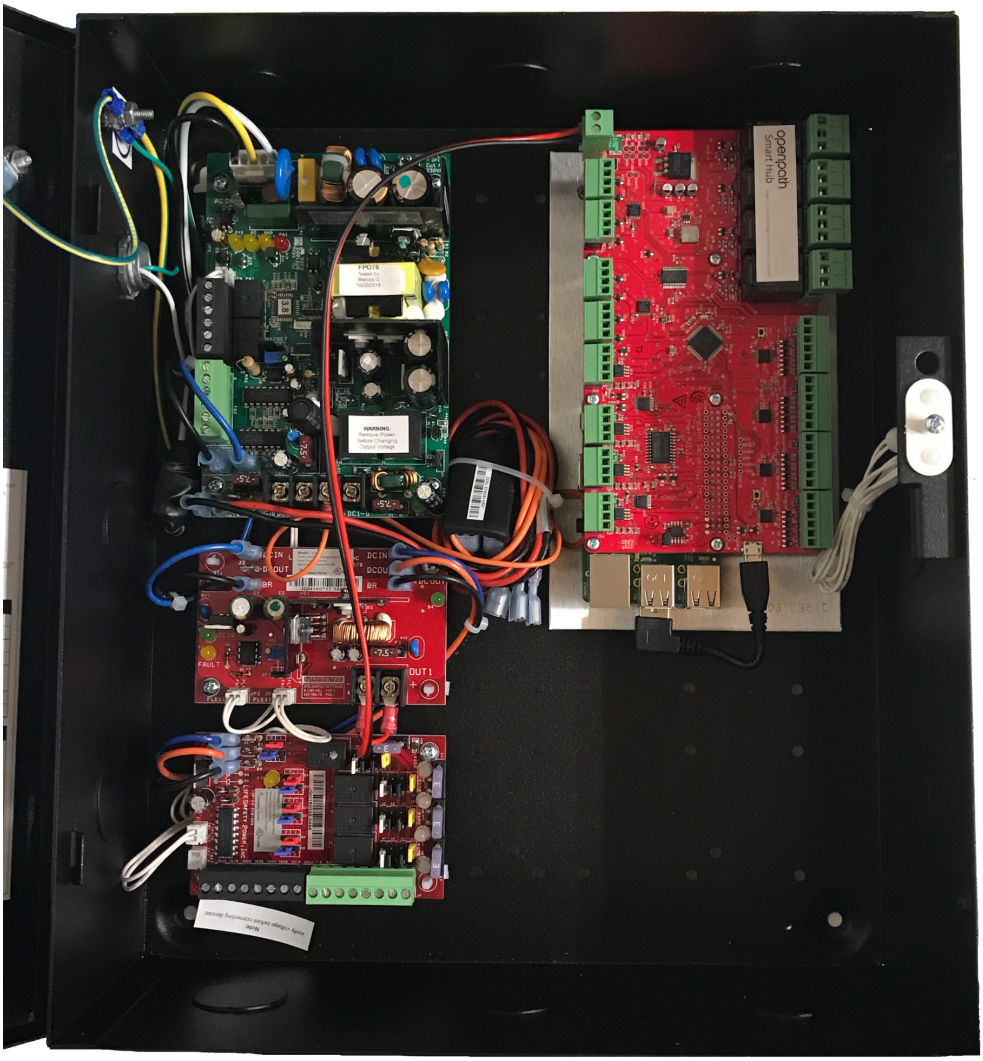

Figure 30 First gen 12/24V Smart Hub configuration

WIRING WITH THE 12/24V POWER SUPPLY

The 12/24V Smart Hub ACU (OP-4ESH-24V) uses the LifeSafety Power® FPV4[1] to power 24V locking hardware, a LifeSafety Power B100[2] secondary power supply to power the ACU Board, and the LifeSafety Power C4 Control Module[3] to power 12V locking hardware.

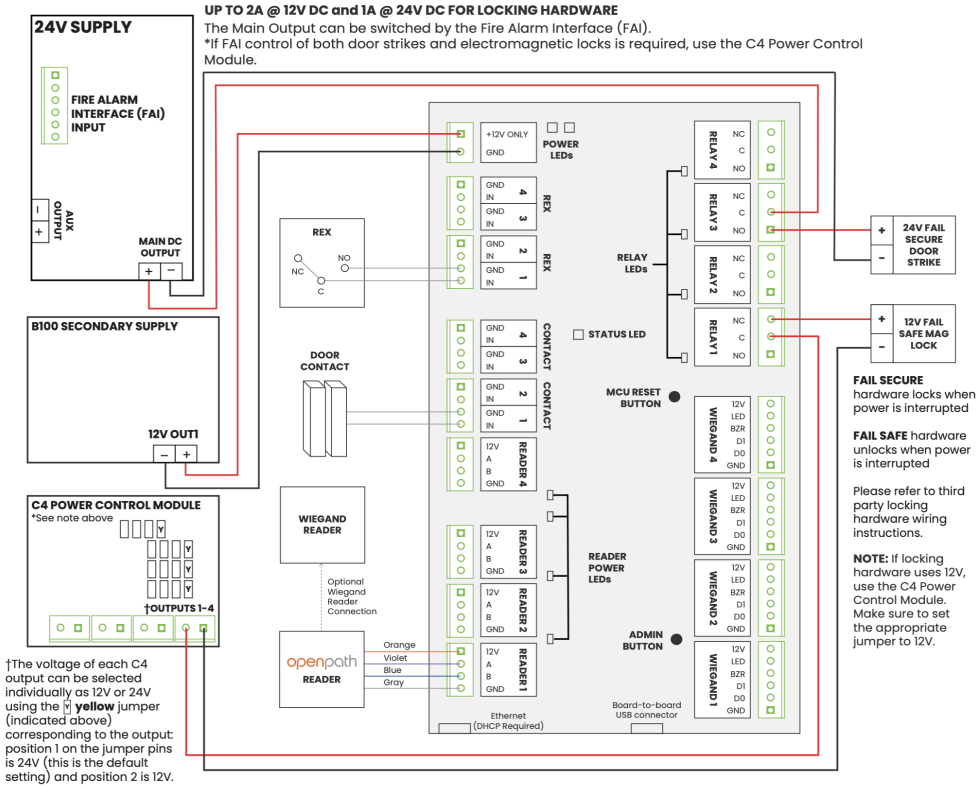

Figure 31 OP-4ESH-24V Wiring Diagram

All of this is configured as one Entry in the Openpath Control Center. We recommend matching port numbers (READER 1 with CONTACT 1, for example). When setting up Sites in the Control Center using Quick Start, Entries will default to matching READER 1 with CONTACT 1, RELAY 1, and so on. For more complex Entry setups, you'll need to manually add Controls to the Entry. For the example above, you'd need to add an additional entry or exit Hardware Control to the Entry. For more information, refer to the Openpath User Guide.

[1]For more information, see https://www.lifesafetypower.com/docs/im_fpv-standard.pdf.

[2]For more information, see https://lifesafetypower.com/docs/im_b100.pdf.

[3]For more information, see https://lifesafetypower.com/docs/im_c4c8.pdf.

This example contains:

- An Openpath Reader on READER 1 port (also connected to a Wiegand reader, optional)
- A door contact sensor on CONTACT 1 port
- A REX on REX 1 port
- A 24V fail secure door strike on RELAY 3
- A 12V fail safe electromagnetic lock on RELAY 1

WIRING WITH THE 12V POWER SUPPLY

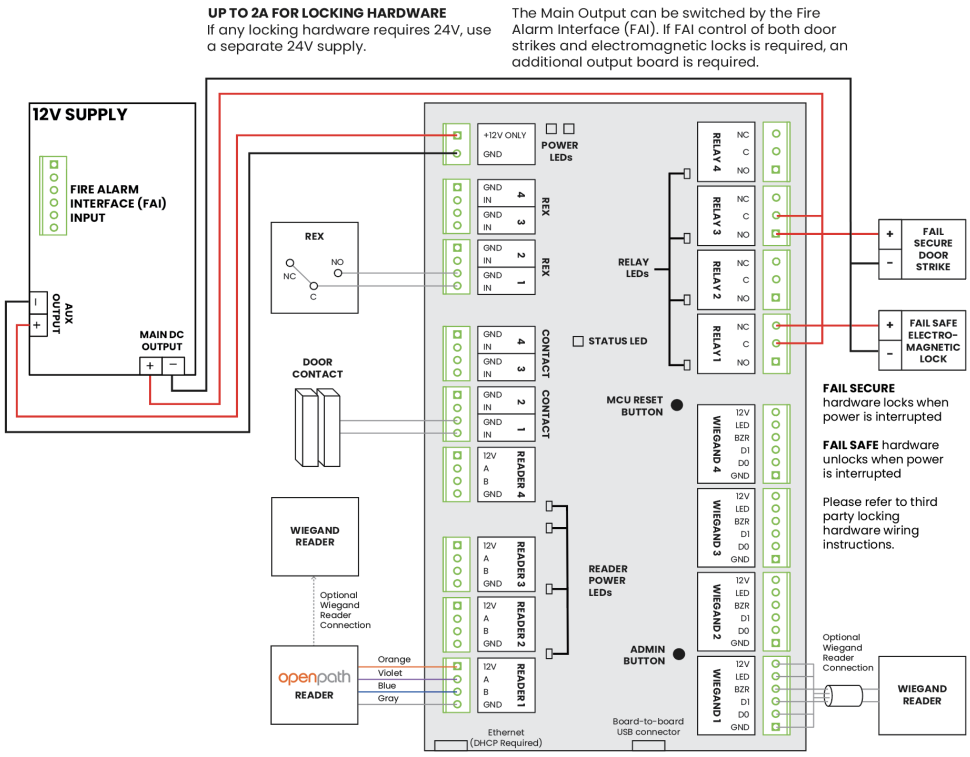

Figure 32 OP-4ESH-12V Wiring Diagram

WIRING THE OPENPATH ELEVATOR BOARD TO A 4 DOOR CONTROLLER

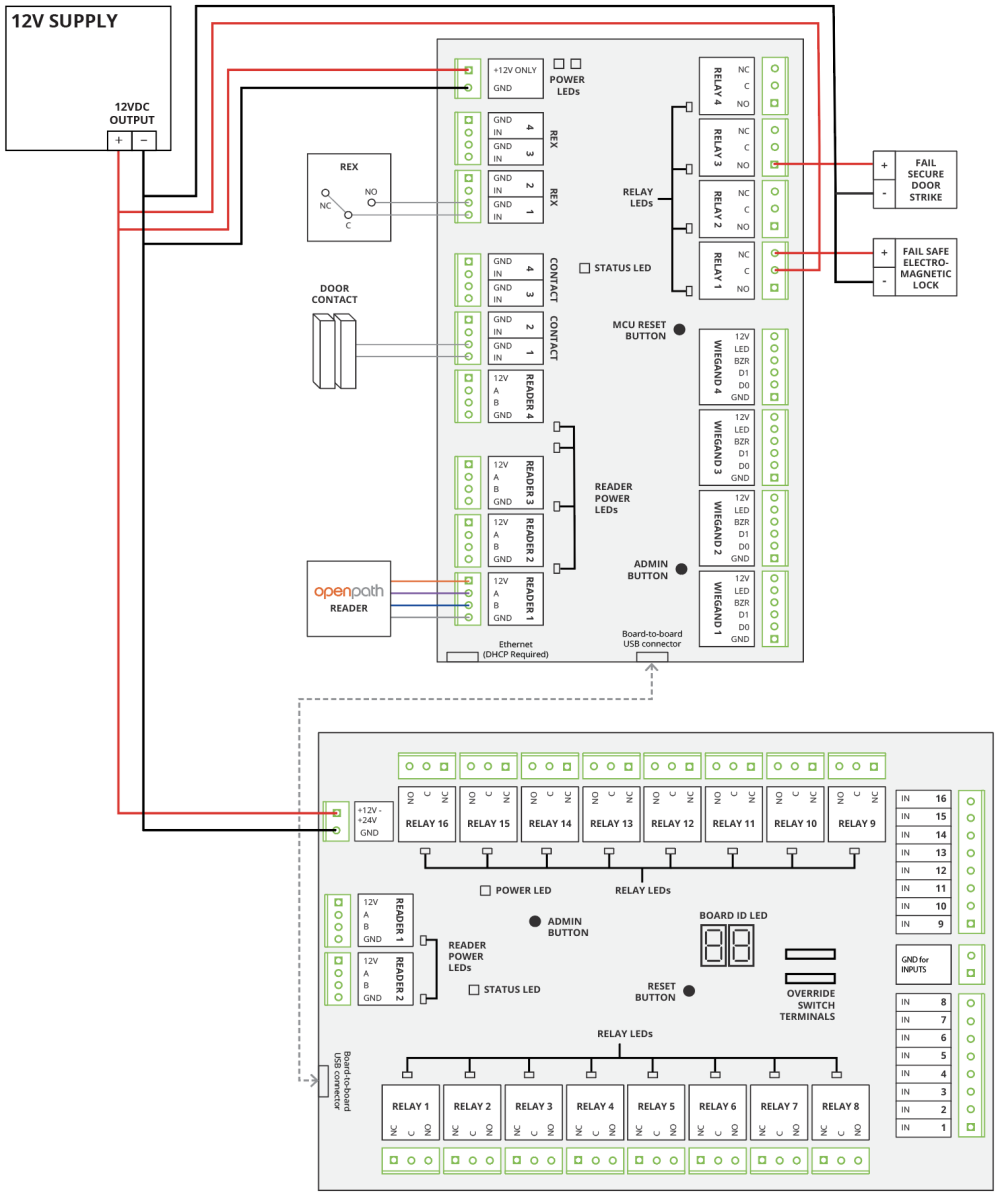

Figure 33 Wiring the Openpath Elevator Board to a 4 Door Controller

WIRING THE 4 DOOR CONTROLLER TO LEGACY PANELS

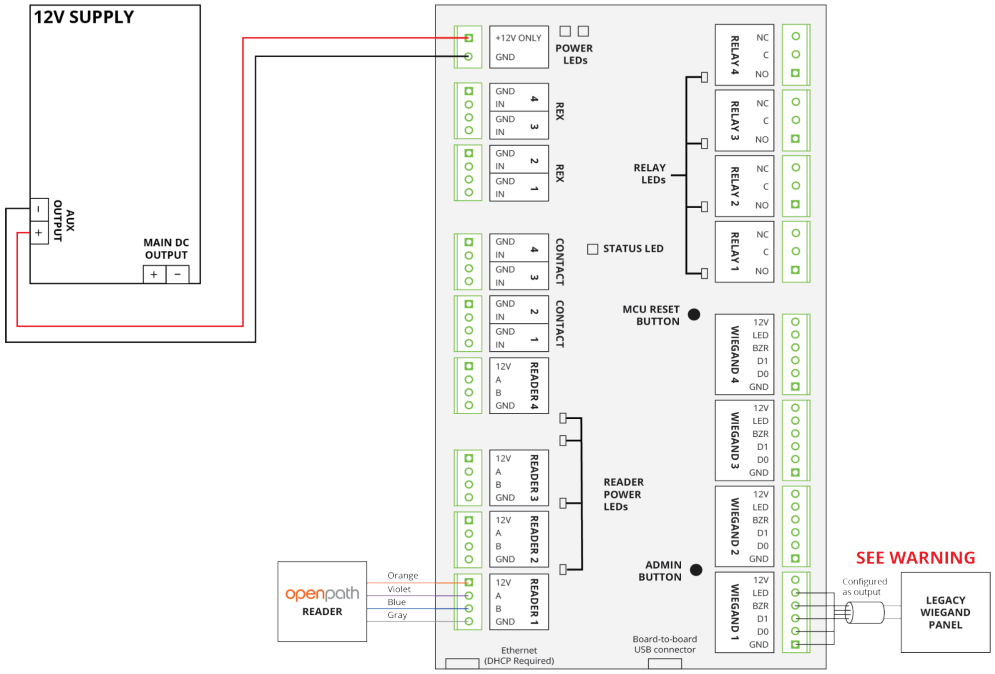

Figure 34 Wiring to Legacy Panels

WARNING: Do not connect 12V out on the Wiegand port to the legacy panel; doing this will cause voltage backfeeding, potentially damaging one of the supplies.

TROUBLESHOOTING

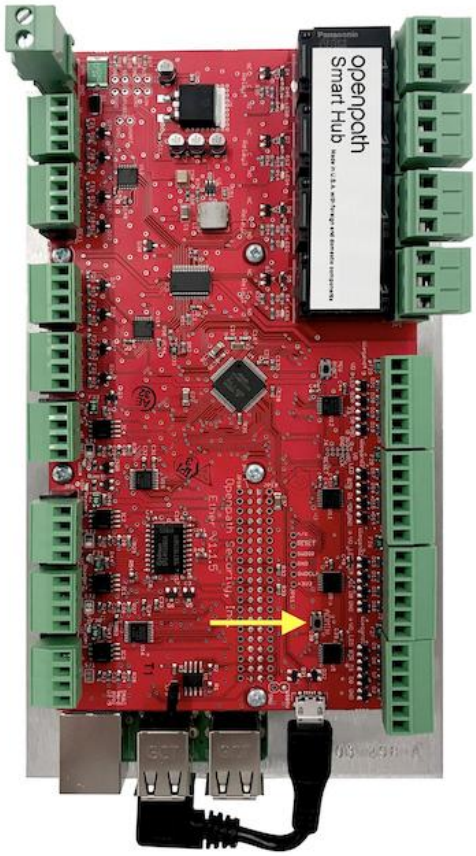

Figure 35 ADMIN Button on 4 Door Controller

HARD RESET THE ACU

1. Disconnect power from the ACU.
2. Press the ADMIN button for 15 seconds.
3. While still pressing the ADMIN button, reconnect the power, and continue to hold the button for another 15 seconds. You should see two POWER LEDs light up in the top left corner.
4. Wait 15 minutes before PROVISIONING THE ACU on page 37.

4 DOOR CONTROLLER LEDS

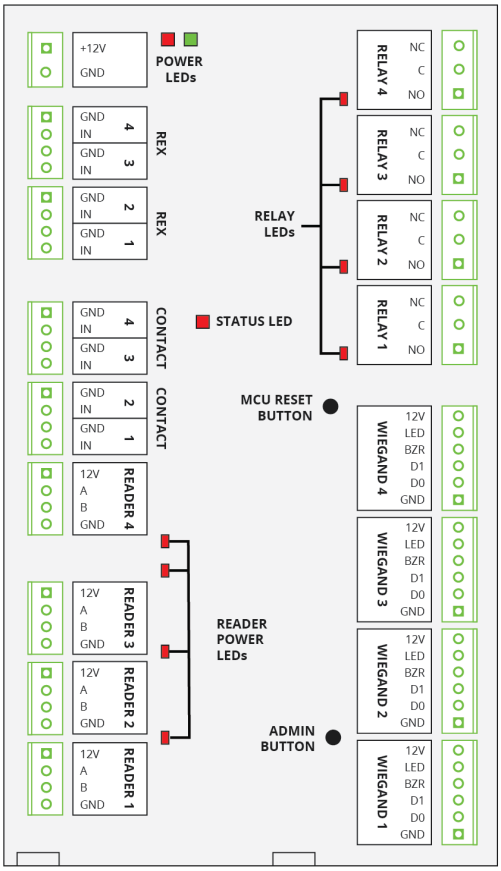

Figure 36 4 Door Controller LEDs

- **POWER LEDs** indicate that the board is connected to power.
- **RELAY LEDs** indicate when the relays are activated.
- **READER POWER LEDs** indicate that the Controller has output power enabled per reader.
- The **STATUS LED** indicates that the Controller has been configured with firmware.

REGULATORY

All national and local electrical codes apply.

UL 294

The following performance levels are defined for the Openpath Core Series hardware and 4 Door Controller, as per UL 294:

Attack:	Level I
Endurance:	Level I
Line Security:	Level I
Standby:	Level I

CAN/ULC 60839-11-1-16 GRADE 1

For C-UL Listed applications, the unit shall be installed in accordance with Part 1 of the Canadian Electrical Code.

FCC

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. To comply with FCC RF exposure compliance requirements, a separation distance of at least 20 cm should be maintained between the antenna of Openpath Smart Reader(s) and persons during operation.

NOTE: 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.

OP-RLF-STD/MULB: FCC ID: 2APJVOPRLF

OP-RHF-STD/MULB: FCC ID: 2APJVOPRHF

OP-R2-STND: FCC ID: 2APJVOPR2LHF

OP-R2-MULL: FCC ID: 2APJVOPR2LHF

IEC 62368-1

- This equipment is intended only for use in a restricted access area.
- Securely fasten the equipment according to LifeSafety Power mounting instructions. See FlexPower Vantage Standard Power System - Installation Manual[1].
- PROTECTIVE EARTHING: For safety, the Smart Hub must only be plugged into a grounded 3-prong outlet, wired with a minimum of 16 gauge wire to ground.

RF RADIATION HAZARD WARNING

To ensure compliance with FCC and Industry Canada RF exposure requirements, this device must be installed in a location where the antennas of the device will have a minimum distance of at least 20 cm from all persons. Using higher gain antennas and types of antennas not certified for use with this product is not allowed. The device shall not be co-located with another transmitter.

Installez l'appareil en veillant à conserver une distance d'au moins 20 cm entre les éléments rayonnants et les personnes. Cet avertissement de sécurité est conforme aux limites d'exposition définies par la norme CNR-102 at relative aux fréquences radio.

INDUSTRY CANADA NOTICE AND MARKING

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other Users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente

[1]See https://lifesafetypower.com/docs/im_fpv-standard.pdf.

(p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

WARNINGS

- Disconnect power before servicing.
- Do not plug into an outlet controlled by an on/off switch.
- Powering the power supply with 230V requires jumper modification. See the power supply data sheet for more information.

SPECIFICATIONS

Note: For the Openpath hardware specifications, refer to the product datasheets on page 6.

Table 3 Electrical specifications of Openpath hardware

Single Door Controller (OP-2ESH-POE)	12-24VDC, 0.3A @ 24V
Video Reader Pro	Input Voltage: PoE (48V) Power Consumption: 7.8W
Smart Reader v2 (OP-R2-STND, OP-R2-MULL)	12-24VDC, 0.25A @ 12V, 0.12A @ 24V OP-R2-STND: FCC ID: 2APJVOPR2LHF OP-R2-MULL: FCC ID: 2APJVOPR2LHF

Smart Readers (OP-RLF-STD, OP-RHF-STD, OP-RLF-MULB, OP-RHF-MULB, OP-R2LHF-STD, OP-R2LHF-MUL)	12VDC, 0.25A OP-RLF-STD/MULB: FCC ID: 2APJVOPRLF OP-RHF-STD/MULB: FCC ID: 2APJVOPRHF OP-R2LHF-STD: FCC ID: 2APJVOPR2LHF OP-R2LHF-MUL: FCC ID: 2APJVOPR2LHF
4 Door Controller (OP-AS-01/OP-4ECTR)	10-14VDC, 1A
16 I/O Elevator Board (OP-16EM)	12-24VDC, 0.35A @ 12V, 0.2 @ 24V
4-Port Board (OP-EX-4E)	12-24VDC, 0.4A @ 24V
8-Port Board (OP-EX-8E)	12-24VDC, 0.6A @ 24V
Access Control Core (OP-ACC)	12-24VDC, 0.4A @ 12V, 0.2A @ 24V
Smart Hub with 12/24V Supply (OP-4ESH-24V)	120V, 0.7A or 230V, 0.3A, 50/60 Hz