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Openpath Access Control System Installation Guide

GETTING STARTED

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.

ADDITIONAL RESOURCES

- Smart Reader Data Sheet
- Smart Hub (ACU) Data Sheet
- Elevator Board Data Sheet
- Openpath User Guide
- Openpath SDC Install Guide
- Life Safety Power FPV Installation Guide
- Life Safety Power FPO Installation Guide
- Life Safety Power B100 Installation Guide

PRIOR TO INSTALLATION

Prior to installing Openpath hardware, perform a customer site survey to determine the following:

- How many entries need to be configured (e.g. doors, gates, and/or 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 the Smart Hub ACU with included 24V power supply (OP-4ESH-24V) or use a separate 24V supply.
  - Note: The Smart Hub ACU with 12V power supply (OP-4ESH-12V) supports up to 2A for 12V locking hardware.
- Whether you’re providing backup batteries for the ACUs. See SELECTING A BACKUP BATTERY.
- Whether you’re supporting a legacy access control panel. See WIRING TO LEGACY PANELS.
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. Openpath uses the following outbound ports:

- TCP port 443
- TCP port 80
- UDP port 123

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

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

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 (12V)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Smart Hub ACU</td>
<td>1A</td>
</tr>
<tr>
<td>Smart Reader</td>
<td>0.25A</td>
</tr>
<tr>
<td>Locking hardware (while engaged)</td>
<td>0.25A–0.5A</td>
</tr>
</tbody>
</table>

Assuming a 12V power supply, a Smart Hub ACU 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 = 12 AH, so a 12V 12AH sealed lead acid (SLA) or gel cell battery.

**Note:** For a 24V power supply, you need two 12V SLA or gel cell batteries in series.
MOUNTING INSTRUCTIONS

For a UL Listed System, the Smart Hub ACU must be mounted in a LifeSafety Power E1 enclosure with an FPO75 power supply.

To mount the enclosure:
1. (Optional) Remove the enclosure’s 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.

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

To install a standalone Controller Board with 24V locking hardware:
If you purchased the Controller Board separately and are using 24V locking hardware, we recommend using the LifeSafety Power E1 enclosure, FPO75 power supply (or FPV4 power supply), B100 secondary power supply, and C4 power control module.

1. Follow all LifeSafety Power instructions for installing the FPO75 (or 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 as detailed above.
To install a standalone Controller Board with 12V locking hardware:
If you purchased the Controller Board separately and are using 12V locking hardware, we recommend using the FPV4-E1 power supply/enclosure.

1. Follow all LifeSafety Power instructions for installing the power supply in the enclosure.
2. Mount the Controller Board using the provided back plate.
3. Connect the power supply to the Controller Board.
   **IMPORTANT:** Verify that the jumper on the FPV4 is set to 12V.
4. Mount the enclosure as detailed above.
Figure 2: 12V Smart Hub ACU Configuration
RECOMMENDED CONFIGURATION

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).

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. See [WIRING THE OPENPATH ELEVATOR BOARD](#).

**WARNING:** Always remove power from the Smart Hub and locking hardware when wiring readers and other devices. Failure to do so can damage the Controller Board.
WIRING WITH THE 12/24V POWER SUPPLY

The 12/24V Smart Hub ACU (OP-4ESH-24V) uses an FPO75 to power 24V locking hardware, a B100 secondary power supply to power the ACU Board, and a C4 Control Module to power 12V locking hardware.

![Diagram of wiring with the 12/24V Power Supply]

The example in figure 3 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

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 (like the example in figure 3), you’ll need to manually add Controls to the Entry. For the example above, you’d need to add an additional Entry/Exit Hardware Control to the Entry. For more information, refer to the Openpath Admin Exit User Guide.

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. You can wire additional REXs to the REX inputs on the ACU, as shown in figure 3.

**Figure 4: Wiring the REX with the Door Strike**
WIRING THE REX WITH THE ELECTROMAGNETIC LOCK

For safety-related applications, you must wire the REX directly to the electromagnetic lock. You can wire additional REX switches and sensors to the REX inputs on the ACU, as shown in figure 3.

**Figure 5:** Wiring the REX with 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

**Figure 6**: Wiring Fail Safe and Fail Secure Locking Hardware

**Note**: Some door strikes can be wired as fail safe and some electromagnetic locks can be fail secure; always check your third-party locking hardware wiring instructions and ensure you're using the right configuration for your requirements.
WIRING TO LEGACY PANELS AND MOBILE GATEWAY

To support a legacy access control system, install the ACU between the Openpath Readers and the legacy panel, with the ACU Wiegand port configured as output to the legacy panel. Replace low frequency (LF) Wiegand readers with LF Openpath Readers and high frequency (HF) Wiegand readers with HF Openpath Readers. In this setup, the legacy panel controls all locking hardware and entry mechanisms while the Openpath system allows you to use the Openpath mobile app, Smart Reader, and Touch functionality. Refer to the Openpath User Guide for more information on configuring Mobile Gateway settings.

**Figure 7**: 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.
Connect locking hardware to 12V or 24v as required.

**Figure 8:** Wiring the Openpath Elevator Board
Troubleshooting

**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 Smart Hub. 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.

**ACU LEDS**

![ACU LEDs Diagram](image)

*Figure 9: ACU LEDs*
The Openpath ACU has several LEDs that indicate the following:

- POWER LEDs indicate that the ACU is connected to power
- The four RELAY LEDs indicate when the relays are activated
- The STATUS LED in the center of the ACU indicates that the ACU has been configured with firmware. It will flash green when **identify** is pressed in the Control Center.
- The four READER POWER LEDs indicate that the ACU has output power enabled per reader

**READER LEDS**

The Openpath Smart Reader’s LEDs indicate the following:

- If the center dot is solid white, then the door is locked
- If the outer ring is solid white, then the door is unlocked
- If the center dot quickly switches between multiple colors and outer ring quickly spins once, the reader has just received power
- If all lights are off, the reader is not connected to power (check to see if the power wires are swapped)
- If the center dot is flashing red, the reader is connected to power but cannot communicate with the ACU (check to see if the +B [blue] and −A [violet] lines are swapped)
- If the center dot is solid blue, the reader is connected to power and can communicate with the ACU, but has not been configured as an entry in the Control Center
- If the center dot is solid green, and the outer ring lights up and spins, that means the reader has been **identified** via the Control Center
- If the center dot is solid purple and the outer ring is solid white, the 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
- If the 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)

**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, which requires having a computer on the same network as the ACU.

**To hard reset the ACU:**

1. Disconnect power from the ACU
2. Hold down the ADMIN BUTTON for 15 seconds
3. While still holding down 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](#)

![ADMIN button](image)

**Figure 10:** ADMIN button

**PROVISIONING THE ACU**

Provisioning the ACU means registering it in the online portal and getting it up and running with the latest firmware. ACUs are shipped already provisioned, but below are instructions for this process in the case of [RESETTING THE ACU](#).
Requirements:

- Meet all NETWORK REQUIREMENTS
- Connect the ACU to the Internet via Ethernet
- A laptop on the same network as the Smart Hub. If you have a VLAN, make sure the laptop is on the same VLAN as the Smart Hub.
- If using Windows or Linux, you must download iTunes. The provisioning process uses Bonjour software that comes with iTunes. Optionally, you can download iTunes and use an archive utility to extract and install only the Bonjour MSI.

To provision the ACU:

1. First, HARD RESET the ACU
2. On a computer or mobile phone on the same network as the ACU, go to https://control.openpath.com and log in
3. Go to Hardware > ACU Management
4. Locate the ACU on the list and click Register
5. A new window will open with instructions on registering the ACU. Click Yes to proceed.
6. If you don’t see your ACU listed, create a new one:
   a. Click Add ACU and enter a name
   b. Click on the Add ACU Expansion Board dropdown, select Openpath ACU, and click Add
   c. Click Save
7. Hold down the ADMIN button for three seconds
8. In the Control Center, click the blue Register next to the name of your ACU
9. Click Yes to proceed
10. A new window will open, click Provision
11. 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. What are the Network Requirements for the Openpath Smart Hub?
   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. Hit `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.

Regulatory

All national and local electrical codes apply.

**UL 294**

When the Openpath Smart Hub 4 Door Controller is enclosed in the E1 enclosure and powered by FPO75, the following performance levels are defined for the access control unit 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

IEC 62368-1

- This equipment is intended only for use in a restricted access area.
- 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 (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 power supply with 230V requires jumper modification, see power supply data sheet for more information

Technical Specifications

<table>
<thead>
<tr>
<th><strong>Table 2</strong>: Technical specifications of Openpath hardware</th>
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<tbody>
<tr>
<td>Smart Hub with 12/24V Supply (OP-SH-24V)</td>
</tr>
</tbody>
</table>
| Smart Readers (OP-RLF-STD, OP-RHF-STD, OP-RLF-MULB, OP-RHF-MULB) | 12VDC, 0.25A  
OP-RLF-STD/MULB: FCC ID: 2APJVOPRLF  
OP-RHF-STD/MULB: FCC ID: 2APJVOPRHF |
| Standalone ACU Board (OP-4ECTR)                          | 10–14VDC, 1A |
| Elevator Board (OP-16EM)                                 | 12–24VDC, 0.35A |