AVIGILON™
Single Door Controller

Installation Guide
OP-CR-SDC

Some hardware may show the Openpath logo.

Revisions

Guide	Description
Rev. 2.0	OP-CR-SDC updates: For more information on page 7, Power requirements on page 8, Mount on a standard US 1-gang box on page 9, SDC wiring configuration on page 11, Wiring Avigilon readers on page 12, Appendix: Best practices - Wiring a REX to your Avigilon Alta access control system on page 24
Rev. 1.8	Enable Static Cloud IP field: Add SDCs using Alta Control Center on page 16, Disable the Static Cloud IP connection on page 18
	Provision with Static Cloud IP field: Provision SDCs using Open Admin app on page 19
Rev. 1.7	Menu name and icon updates in the Alta Control Center
	Embedded USB Smart Reader support: For more information on page 7, Wiring Avigilon readers on page 12
	European (EU) Alta Control Center: Add SDCs using Alta Control Center on page 16

Contents

Before you start

This installation guide explains how to install and configure the Avigilon Single Door Controller (SDC) as part of an Avigilon Alta access control system.

Conducting site surveys

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

- The number of entries that need to be configured (for example, doors, gates, and elevator floors)

- Whether you're using legacy wiring or new wiring

- The electronic entry mechanisms, Request to Exit (REX) mechanisms, and door contact sensors that will be used and their power requirements.

- Whether you're providing backup batteries for the Single Door Controller. See Selecting a backup battery on page 9.

- Whether you're supporting a legacy access control panel for mobile gateway.

For more information

For hardware specifications, see the following datasheets.

Avigilon controller	Avigilon Single Door Controller Datasheet (OP-CR-SDC)
Avigilon Smart Readers and Pro Series Readers	Openpath Standard Smart Reader v2 Datasheet (OP-R2X-STND)
	Openpath Mullion Smart Reader v2 Datasheet (OP-R2X-MULL)
	Openpath Mullion and Standard Keypad Readers (OP-RKP-MULL, OP-RKP-STND)
	Openpath Embedded USB Smart Reader Datasheet (OP-R2X-EMBD)
	Openpath Video Intercom Reader Pro Datasheet (OP-VID-PRO-INT)
	Openpath Video Reader Pro Datasheet (OP-VID-PRO-RDR)

For additional product and support documentation, see:

- help.openpath.com
- Avigilon Alta Control Center Administrator Guide
- Avigilon Alta Access Control System Installation Guide

Installation

Network requirements

An Ethernet connection with DHCP can be used to connect the Avigilon SDC to the Local Area Network (LAN). You may also need to configure firewall settings to communicate with the Avigilon Alta access control 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 Openpath Mobile Access app, the inbound TCP port 443 of the SDC 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 .

Power requirements

The Avigilon SDC can be powered using Power-over-Ethernet (PoE or PoE+), and/or an external 12-24V supply. The SDC will automatically switch to the higher voltage source if both PoE and an external source are available. We recommend using a backup battery in case of power failures on the external 12-24V supply or the PoE supply.

Electrical	
Supply Requirement	PoE, PoE+, or external 12-24VDC
	Note: When using an external supply, if 24V wet relay output is required a 24V external supply must be used.
External Supply Rating	12V @ 2A min. or 24V @ 1A min.
Output Ratings	Power Out can supply up to 100mA @ 12V or 50mA @ 24V
	2 reader ports, max power output: 250mA @ 12V each
	2 relays, max power output: PoE: Max 3W combined output (250mA @ 12V, 125mA @ 24V) PoE+: Max 9W combined output (750mA @ 12V, 375mA @ 24V)

Selecting a backup battery

While not required, a backup battery is recommended in case of power outages. For PoE power backup, refer to the manufacturer's instructions for your PoE injector or switch. When using an external supply, 12V supplies require one 12V backup battery. 24V supplies require two 12V batteries in series. The size of battery depends on your setup and how long you want to power the system.

Table 1 Example power requirements (24V)

Single Door Controller	.3A
Smart Reader (2)	0.25A
Locking hardware (while engaged)	0.125A − 0.25A

Assuming an external 24V power supply, an SDC configured with two Avigilon readers and locking hardware uses about 1.1 Amps. To keep the system running for 3 hours with all entries engaged, you need 1.1A x 3 hours = 3.3 AH, so two 12V 4AH sealed lead acid (SLA) or gel cell batteries in series.

Mounting options

Install the Avigilon SDC on a single or double gang box, or on drywall.

Mount on a standard US 1-gang box

1. Use two 6-32 screws (a) to attach backplate (b) to gang box.

   Recommended: Use the drywall screws (c) and anchors on drywall for added stability.

2. Snap on main housing (d) to backplate (b).

3. On the right side of the main housing (d), ensure that the two edge clips (h) fit into their respective notches on the backplate (b).

4. Press firmly on the main housing (d) to snap into place.

5. Partially unscrew the pre-installed M4 set screw (e) to secure main housing (d) to backplate (b).

6. Use the cable slot (f) to hold cables while wiring.

7. Snap on front cover (g).

> **Note:** For a double gang box, follow the directions above, using additional 6-32 screws.
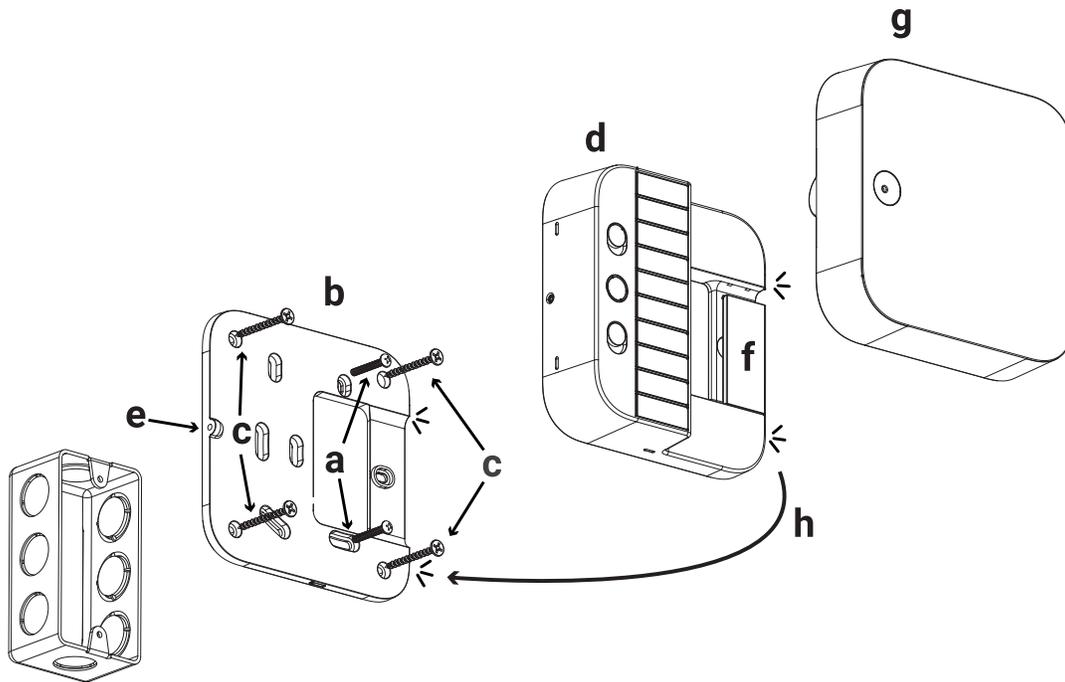
Mount on wall

1. Use the provided drywall screws (c) and anchors (not shown) to attach backplate (b) to wall.

2. Snap on main housing (d) to backplate (b).

3. On the right side of the main housing (d), ensure that the two edge clips (h) fit into their respective notches on the backplate (b).

4. Press firmly on the main housing (d) to snap into place.

5. Partially unscrew the pre-installed M4 set screw (e) to secure main housing (d) to backplate (b).

6. Use the cable slot (f) to hold cables while wiring. See SDC wiring configuration on the next page.

7. Snap on front cover (g).

SDC wiring configuration

FRONT VIEW   **SIDE VIEW**
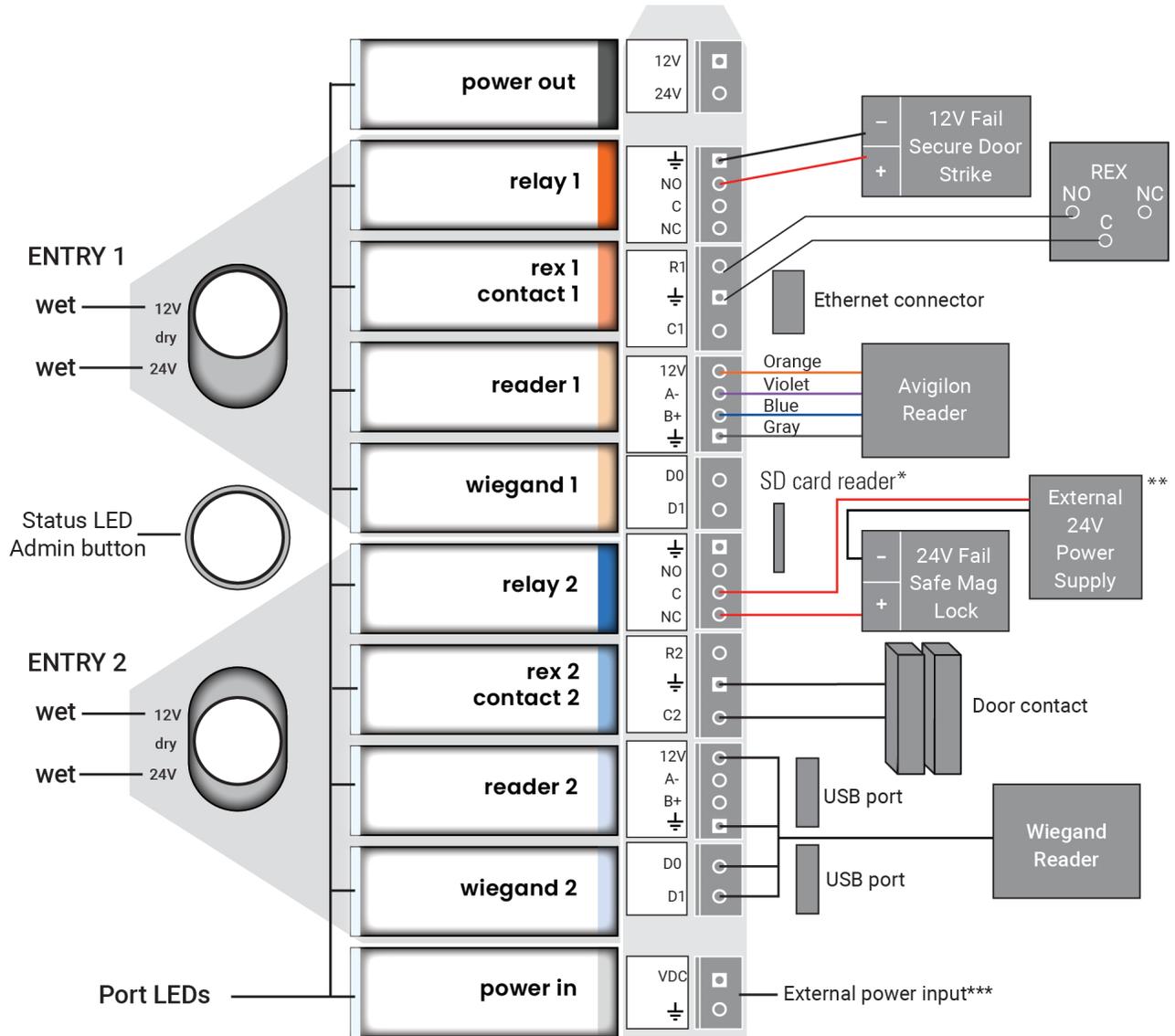
Figure 1 Standard SDC wiring configuration

* SD card must not be removed unless instructed by Avigilon Alta Support.

** 24V locking hardware requires PoE or a 24V power supply.

*** For backup or if PoE not available. 12V @ 2A (min) or 24V @ 1A (min). 24V required if locking hardware requires 24V.

⚠ Certified external power source (complies with LPS) must be used.

Wiring Avigilon readers

Avigilon readers and the SDC communicate via RS-485. The compatible wire types are listed in order of preference which impacts distance.

- **Shielded Cat 6A** (recommended; extra two pairs can be used for sensors)

- Shielded Cat 6

- Shielded RS-485 with 18-24 AWG (lower gauge, thicker wire is better)

- Shielded Cat 5

- Unshielded Cat 6

- Unshielded Cat 5

- Shielded 22/6

- Unshielded 22/6

Note: Use one twisted pair for GND and VIN (power) and one twisted pair for +B and -A (data).

ACU and Wiegand reader wiring

Table 2 Connections from Avigilon ACU to Avigilon reader

Pigtail color	Short name	Full name
Gray	GND	Ground (RTN)
Blue	+B	RS485-B
Violet	-A	RS485-A
Orange	VIN	+12V IN

Table 3 Connections to third-party Wiegand reader (optional)

Pigtail color	Short name	Full name
Red	VO	Wiegand Voltage
Black	GND	Wiegand RTN
Green	WD0	Wiegand Data 0
White	WD1	Wiegand Data 1
Brown	LED	Wiegand LED
Yellow	BUZZER	Wiegand Buzzer

Temperature must not exceed -22°F to 140°F (-30°C to 60°C).

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 SDC. 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 SDC. If you need more than two access controlled floors or readers, add the 16 I/O Elevator Board.

> **Warning:** Always remove power from the SDC and locking hardware when wiring Avigilon readers and other devices. Failure to do so can damage the SDC.

Set up tamper alerts

The front cover of the SDC has a built-in tamper sensor and will report tamper events when the cover is removed. You can monitor tamper events using the Tamper Detector State Changed alert. Refer to How do I set up alerts?

Wiring fail-safe and fail-secure lock hardware

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

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

For information about wiring third-party lock hardware, refer to vendor documentation.

Voltage switches

> **Warning:** Remove the DC Input Power and PoE before changing the voltage of the relays.

Wet relay example

To power locking hardware without an external supply (Wet Relay), select 12V or 24V, and connect locking hardware to NO and GND for fail-secure locks, or NC and GND for fail-safe locks.

FRONT VIEW

SIDE VIEW

power out

12V
24V

relay 1

NO
C
NC

12V Fail Secure Door Strike
−
+

ENTRY 1

wet — 12V
dry
wet — 24V

rex 1 contact 1

R1
C1

reader 1

12V
A-
B+
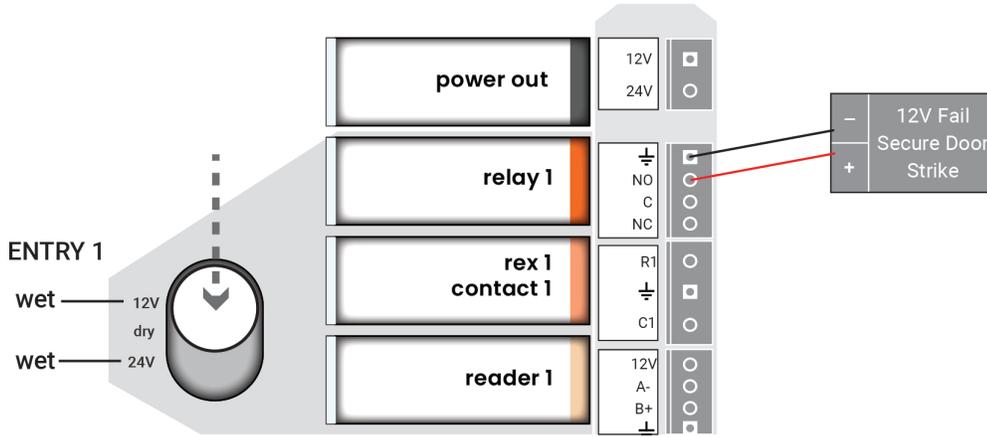
Dry relay example

To use external power, select DRY and use NO or NC and C, and wire to external supply.

FRONT VIEW

SIDE VIEW

wiegand 1

D0
D1

Status LED
Admin button

relay 2

NO
C
NC

External 24V Power Supply **

24V Fail Safe Mag Lock
−
+

ENTRY 2

wet — 12V
dry
wet — 24V

rex 2 contact 2

R2
C2

reader 2

12V
A-
B+

** 24V locking hardware requires PoE or a 24V power supply.

Provisioning

Provisioning the Avigilon SDC means registering it in the Alta Control Center and getting it up and running with the latest firmware. You will need to re-provision in the case of a hard reset, see .

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

Prerequisites

- Meet all .

- Connect the SDC 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 SDC. If you have a VLAN, make sure the laptop is on the same VLAN as the SDC.

- If using a laptop running Microsoft™ Windows or Linux®, you must download the iTunes app. 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.
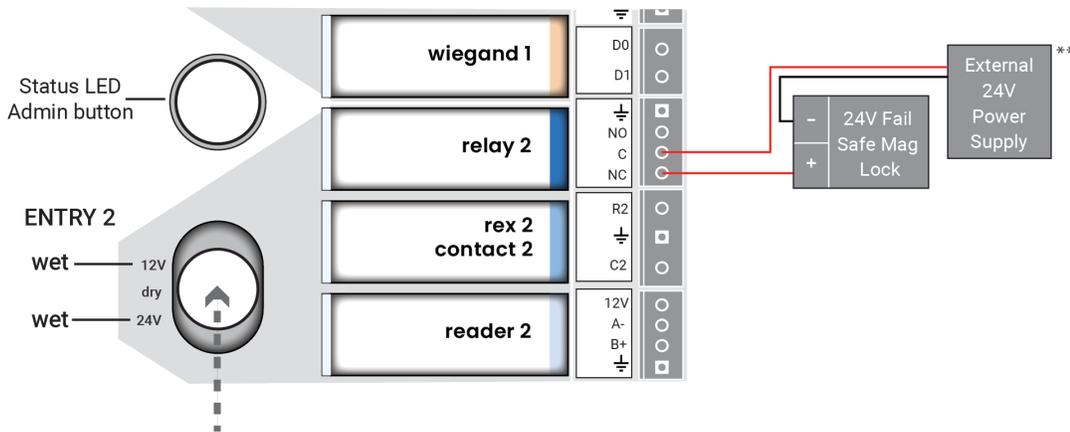
Status LEDs

The Status LED on the Avigilon SDC indicates the following.

Status LED		Description
	Solid white	The SDC is provisioned and functioning normally.
	Solid cyan	The SDC is booting.
	Solid yellow	The SDC is restoring software. Appears when you turn on the SDC for the first time.

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

Status LED		Description
	Blinking yellow	The SDC is updating software. Appears when the SDC has been online for less than 24 hours.
	Solid blue	Unprovisioned state. The SDC has finished booting and is ready for provisioning.
	Solid purple	The SDC is connected to the Open Admin app.
	Blinking purple	The SDC is ready to connect to Open Admin app
	Blinking red	No internet. There is a problem with the internet connection. See Troubleshooting on page 22.
	Solid red	The SDC is in an error state. See Troubleshooting on page 22.

Port LEDs

The Avigilon SDC has eight port LEDs and 2 power LEDs. The port LEDs indicating the following.

Port LED		Description
Avigilon readers or Wiegand Readers	Solid	Normal operation
	Blinking	Error state
Sensors, including REX and Contact Sensors	Solid	Active
	Blinking	EOL shorted or cut
Lock hardware including relays	Solid	Relay is energized
	Blinking	Fault detection

Add SDCs using Alta Control Center

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

Add multiple SDCs using Quick start option

1. Go to control.openpath.com/login and sign in. To access the European Alta Control 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 **Site language**, select the preferred language for the site-wide emails sent by the system.

   b. Click **Next**.

4. Enter the number of controllers located at your site and:

   a. Enter names for the controllers.

   b. In **Controller type**, select **Single Door Controller (SDC)**.

   c. If your SDC also connects to an expansion board, add the appropriate types in EXPANSION BOARDS:

      - **Openpath 16-Port Elevator**

      - **Openpath 4-Port Expansion**

      - **Openpath 8-Port Expansion**

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

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 SDC

1. Go to ▭ **Devices** > **ACUs**.

2. To add a new SDC, click the ➕ button in the upper-right corner.

3. Enter a unique name for the SDC.

4. In **Controller type**, select **Single Door Controller (SDC)**.

5. If your SDC also connects to an expansion board, add the appropriate types in EXPANSION BOARDS:

- **Openpath 16-Port Elevator**

- **Openpath 4-Port Expansion**

- **Openpath 8-Port Expansion**

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

6. Optional. To connect your network to the Cloud using a static IP address and port on an allowlist, select the **Enable Static Cloud IP** toggle. Default port is 443.

> **Note:** An Enterprise plan is required to use Static Cloud IP. In addition, go to ⊕ **App marketplace** and ensure the **Static Cloud IP** app is installed. After the toggle is enabled in the Alta Control Center, open the Open Admin app and select **Provision with Static Cloud IP** to provision the devices.
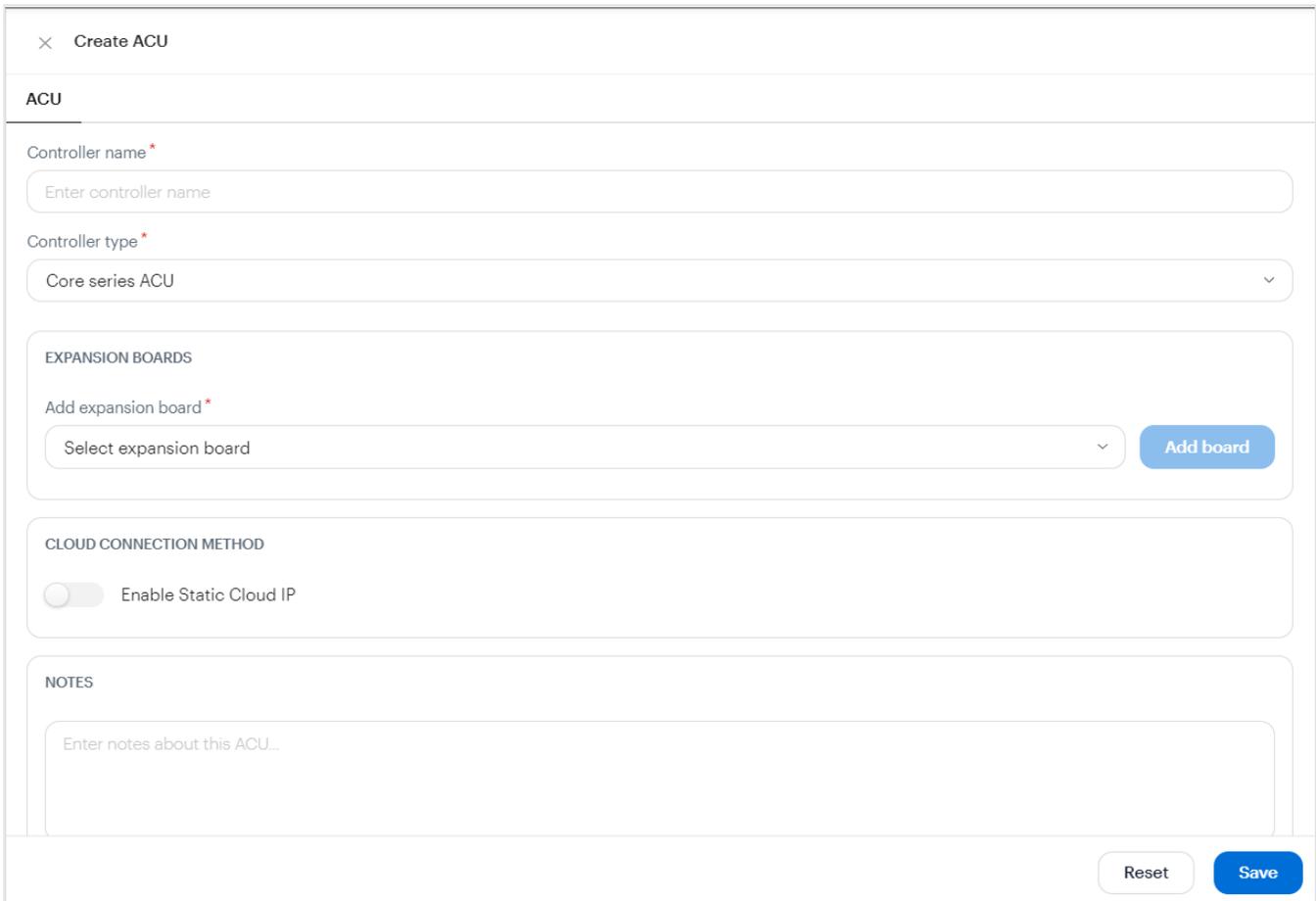
7. Click **Save**.

Disable the Static Cloud IP connection

If it is necessary to disable the Static Cloud IP connection:

- Go to the Edit ACU page, and deselect the **Enable Static Cloud IP** toggle.

  Normal cloud operation resumes after the Static Cloud IP connection is disabled.

Provision SDCs using Open Admin app

1. If powering using PoE, plug in Ethernet. If powering with an external power supply, plug in Ethernet and connect power to POWER IN.

   The Status LED is **solid cyan** .

Figure 2 Status LED and SDC Admin button

2. In the Open Admin app, locate the org to which you're provisioning hardware, either on the list or using search, and then tap on the org name.

3. Wait until the Status LED is **solid blue** and then press the Admin button (see below) on the SDC.

   > **Note:** SDC will disconnect from the Open Admin app after 5 minutes of inactivity. Press the Admin button again to reset the timer.

4. When the Status LED is **blinking purple** , tap on the ACU ending in the last five digits of the serial number in the Open Admin app.

5. When the Status LED changes to **solid purple** , tap **Test Internet Connection** and wait for a green **YES** to appear before proceeding to the next step.

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

   If this step fails, refer to Troubleshooting on page 22.

6. If the internet connection test is successful, tap **Provision Device** in the app.

7. Tap the ACU Name that you want to provision to (this is the name of the SDC you created in the Alta Control Center), and then tap **Yes** to proceed.

8. Optional. Tap **Provision with Static Cloud IP**, if the Static Cloud IP toggle is enabled in the Alta Control Center.

9. When setup is complete, the Status LED will change to **solid white** .

Test internet connection using Open Admin app

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

Configure network settings using Open Admin app

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

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

Change network settings

1. Connect to the SDC by pressing the Admin button again, if needed.

2. Tap on **Network Settings**.

3. Select **Configure network manually**.

4. Configure the network settings as needed. Set a static IP address or set a preferred DNS server.

5. Tap **Save** in the top-right corner.

Set up Wi-Fi on the SDC

1. Connect to the SDC 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 and then tap **Connect**.
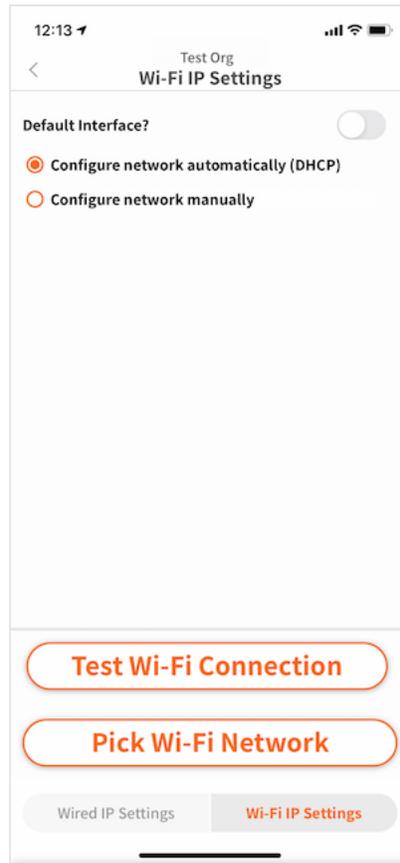
Figure 3 Admin App Wi-Fi Settings

Troubleshooting

Status LED is red

Status LED		Issue and resolution
☀	Blinking red	There is an error connecting to the internet.
		If attempting to set up using Wi-Fi, try switching to an Ethernet connection. See Network requirements on page 8.
●	Solid red	The SDC is in an error state.
		Go to the ▭ **Device** dashboard in the Alta Control Center, and restart the services listed under REMOTE DIAGNOSTICS.
		If this doesn't work, power cycle the SDC. Remove power, wait 10 seconds, reapply power.
		If the error persists, contact Avigilon Alta Support.

Resetting SDCs

Soft reset

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

Hard reset

> **Warning:** Only hard reset the SDC if absolutely necessary and if instructed by Avigilon Alta Support. This will clear all of the data off of the SDC and will require reprovisioning.

1. Disconnect power from the SDC.

2. Press the ADMIN button.

Figure 4 Status LED and SDC Admin button

3. While still pressing the Admin button, reconnect the power, and continue to hold the button for another 15 seconds until the status LED turns yellow , and then release.

4. Wait 15 minutes or until the status LED turns blue before provisioning. See Provisioning on page 15.

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 Avigilon reader and SDC. To remedy this, you can switch GND and VIN with +B and -A connections on the SDC and readers to ensure the data pair (+B and -A) are using the alternate pair of legacy wires.

Appendix: Best practices - Wiring a REX to your Avigilon Alta access control system

For fire and safety reasons, and in accordance with building code in many jurisdictions, a Request to Exit (REX) device is used to ensure free egress.

> **Important:** Always defer to the Authority Having Jurisdiction (AHJ) for all building code requirements, including code requirements for REX devices and how they should connect to an access control system, such as Avigilon Alta.

Wiring REX in series with mag lock or other fail-safe hardware

Although you can wire a REX directly to the Avigilon Alta (formerly Openpath) access control unit (ACU) like other access control systems, the best practice would be to wire the REX device in series with electromagnetic (mag lock) or other fail-safe hardware. This prevents any points of failure in the egress path. If the REX device is wired directly to the REX input on an ACU, then the Avigilon Alta access control system can simply shunt forced-open alarms only, or shunt forced-open alarms and trigger the relay to unlock. In the event of complete power loss, the lock hardware specified by the AHJ would be fail-safe or fail-secure.

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

Wiring REX with Video Reader Pro and Video Intercom Reader Pro

Because these devices do not include a REX input or door relay, you must use a remote ACU to manage door peripherals, such as a door lock relay, door contact, and a REX device. A LAN connection to the remote ACU is required to control all door peripherals that are assigned to the Video Reader Pro or Video Intercom Reader Pro entry. If the Video Reader Pro and the Video Intercom Reader Pro go offline, and if the REX is not wired in a series with the lock hardware, the REX on the entry does not engage the remote relay. It is important to follow the best practices outlined here and the diagrams below to ensure a reliable experience when the Video Reader Pro or Video Intercom Reader Pro is inaccessible due to a network interruption, maintenance, or firmware update.

> **Note:** The following wiring diagram is an example. Make sure you follow the installation instructions of third-party hardware for cable type, power requirements, and manufacturer-specific configurations (for example, DIP switch configuration).

Example: Remote REX on Single Door Controller with Video Reader Pro or Video Intercom Reader Pro
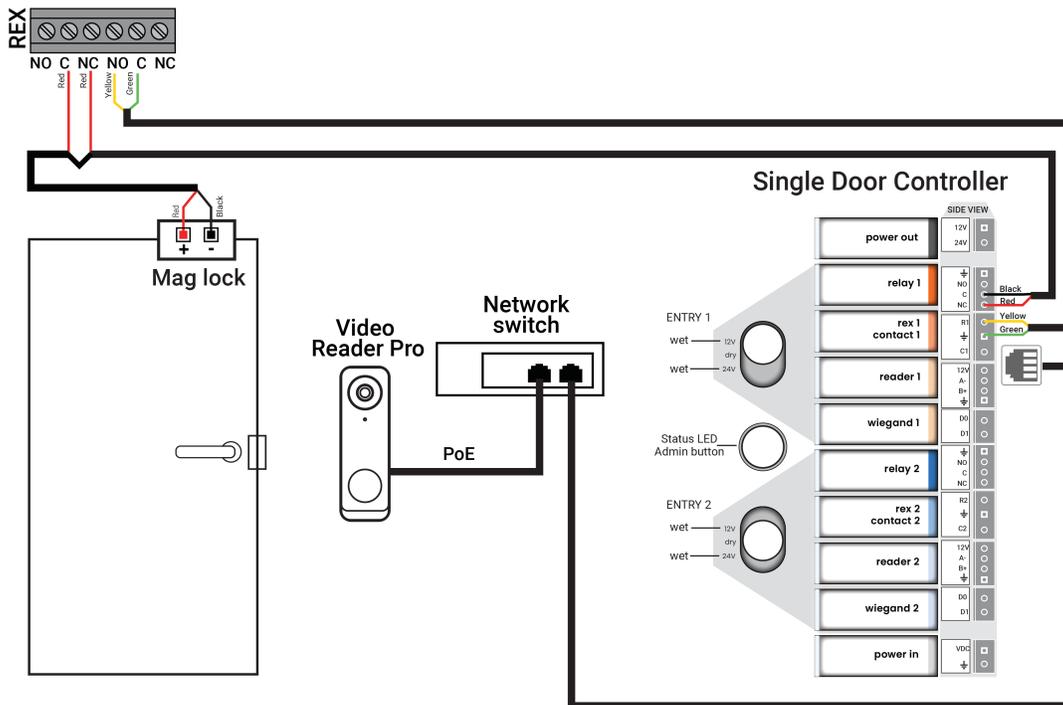
To further improve reliability, Avigilon Alta will be implementing changes that will engage the remote relay for the entry when the REX is triggered even if the associated video device is unavailable. The controller for this relay should have a battery backup or be wired in a fail-safe configuration for maximum reliability.

> **Note:** In Alta Control Center reporting, a REX event on Video Reader Pro and Video Intercom Reader Pro entries will appear twice due to these changes. This duplicate can be safely ignored.

Regulatory

All national and local electrical codes apply.

UL 294

The following performance levels are defined for the Single Door Controller, as per UL 294:

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

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.

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

OP-CR-SDC: Contains FCC ID:2ABCB-RPICM4

RF RADIATION HAZARD WARNING

To ensure compliance with FCC and Industry Canada RF exposure requirements, Smart Hubs 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.

IC Company Number: 25142

OP-CR-SDC: Contains IC ID: 20953-RPICM4

Warnings

- Disconnect power before servicing.

- Do not plug into an outlet controlled by an on/off switch.

Electrical specifications

For the hardware specifications, see the datasheets .

Single Door Controller (OP-CR-SDC)	Supply Requirement: PoE, PoE+, or external 12-24VDC
	Note: When using an external supply, if 24V wet relay output is required a 24V external supply must be used.
	External Supply Rating: 12V @ 2A min. or 24V @ 1A min.
	Output Ratings: Power Out can supply up to 100mA @ 12V or 50mA @ 24V
	2 reader ports, max power output: 250mA @ 12V each
	2 relays, max power output: PoE: Max 3W combined output (250mA @ 12V, 125mA @ 24V) PoE+: Max 9W combined output (750mA @ 12V, 375mA @ 24V)