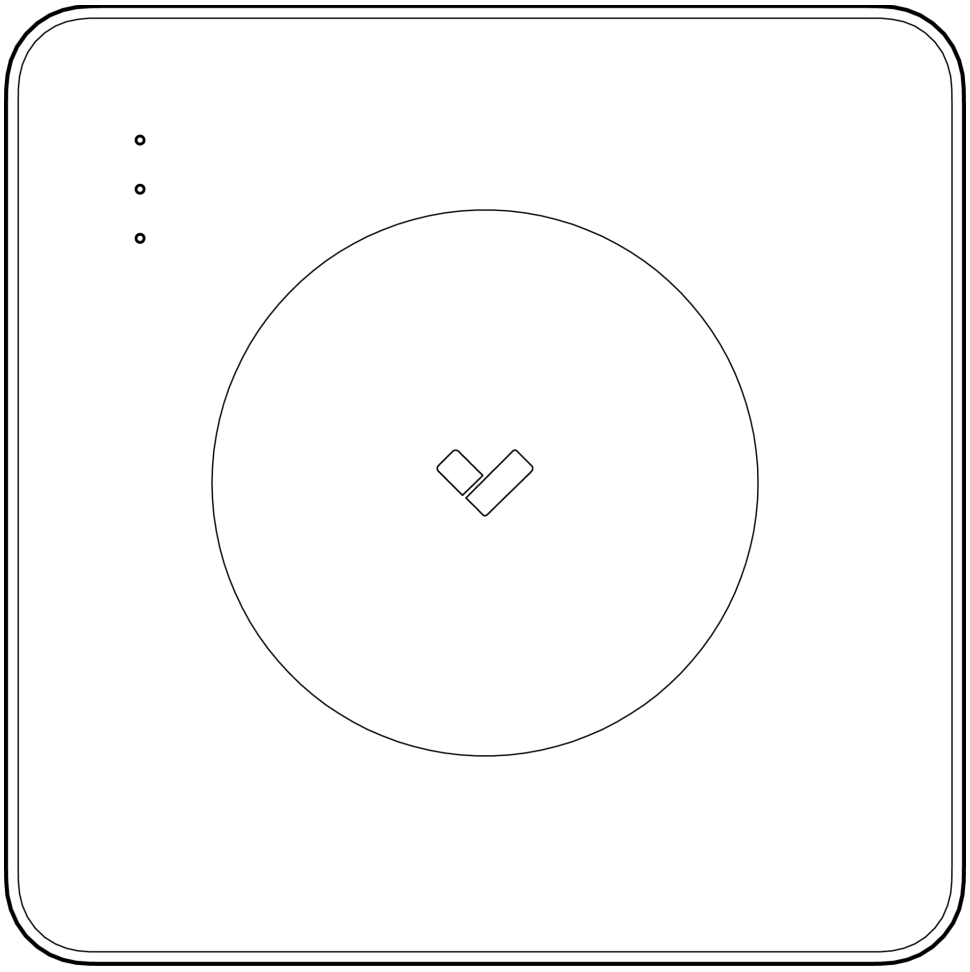
Install Guide

A**C12** One-Door Controller



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Document

Document Details

V1.1 (20240108)

(V1.0 first published 20231031)

Firmware

Firmware version can be verified on
Verkada Command command.verkada.com.

Product Models

This install guide pertains to AC12-HW.

UL294 Performance Levels

- Attack Level: Level 1
- Endurance Level: Level 1
- Line Security Level: Level 1
- Standby Power Level: Level 1

CAN/ULC-60839-11-1

- Environmental Level: Indoor
- Grade Assignment: Grade 1

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Recommended Testing

Installation and/or maintenance of this product shall be performed by trained professionals only.

To ensure ongoing functionality of the AC12, we recommend that you check these interfaces every 6 months:

- Short each input to its adjacent GND port and verify that LED illuminates.
- Use multimeter to confirm expected impedance across relay outputs.
  - Closed across NC and COM
  - Open across NO and COM
- Use multimeter to verify correct voltage is supplied at 12V AUX output, relay contact outputs, and reader power outputs.
- Check the shielding cables of the readers and other AUX wiring, if any, for proper connection to the grounding screw(s) on the chassis.

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AC12 Technical Specifications

Power Consumption	60W maximum
Power Input	IEEE 802.3af/at/bt PoE, PoE+, PoE++ (37VDC — 57VDC), 600mA maximum per pair; 12VDC with 2.5A minimum current
Inputs	2x REX dry inputs 1x DPI dry input 1x AUX dry input
Readers	2x 12VDC @ 250mA reader ports (Verkada/RS-485 or Wiegand) *Note: Each of the 2 reader ports can power a maximum of 1 reader with current consumption of at most 250mA.*
PoE Output	IEEE 802.3af/at PoE, PoE+ (37VDC–57VDC), 600mA maximum
Relay Outputs	1x wet relay for door with switch-selectable power: • 12VDC operation @ 700mA maximum • 24VDC operation @ 350mA maximum • Dry operation, max pass-through current 2A @ 24VDC 1x dry relay for auxiliary output with maximum pass-through current of 24VDC @ 2A (resistive load)
DC Power Output	1x 12VDC @ 100mA maximum
Dimensions	175.5 x 175.4 x 55.3 mm (6.91 x 6.91 x 2.18 in)
Weight	2.87 lb (1.30 kg)
Tamper Detection	Yes
Operating Temperature	0 °C–50°C, 5–85% humidity
Compliance	FCC Part 15B Class B, ICES-003 Class B, CE, UKCA, VCCI, RCM, UL 294, CAN-ULC 60839-11-1, UL 62368-1, and CSA C22.2 No. 62368-1, IK06, Compliant with Requirements of UL2043, Indoor Use Only, to be used in controlled, protected, and/or restricted access areas. Installation and operation of the electronic access control system (EACS) shall not prevent the functionality of the emergency exit functions.
Connectivity	Ethernet: 10/100/1000 Mbps RJ-45 for network connection USB 2.0
Included Accessories	T10 Security Torx screwdriver, mounting hardware kit
Mounting Options	Wall, Ceiling, or Plenum Mount

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AC12 Power Options

This chart outlines the available power options on the AC12. **All power outputs and inputs of this controller are Power-Limited/Class 3.**

	PoE++ *Single Reader and USB Disabled*	PoE++ *In/Out Door and/or USB Enabled*	PoE+	PoE	DC Only
Reader 1	12VDC @ 250mA max	12VDC @ 250mA max	12VDC @ 250mA max	12VDC @ 250mA max	12VDC @ 250mA max
Reader 2	No	12VDC @ 250mA max	12VDC @ 250mA max	12VDC @ 250mA max	12VDC @ 250mA max
Wet Lock	12VDC @ 700mA max or 24VDC @ 350mA max	12VDC @ 700mA max or 24VDC @ 350mA max	12VDC @ 700mA max or 24VDC @ 350mA max	12VDC @ 500mA max or 24VDC @ 250mA max	12VDC @ 700mA max or 24VDC @ 350mA max
USB	No	5VDC @ 250mA max	5VDC @ 250mA max	No	5VDC @ 250mA max
DC Power Out	12VDC @ 100mA max	12VDC @ 100mA max	12VDC @ 100mA max	No	12VDC @ 100mA max
PoE Out	Up to 30W	Up to 27W	Connectivity only, no power	Connectivity only, no power	Connectivity only, no power

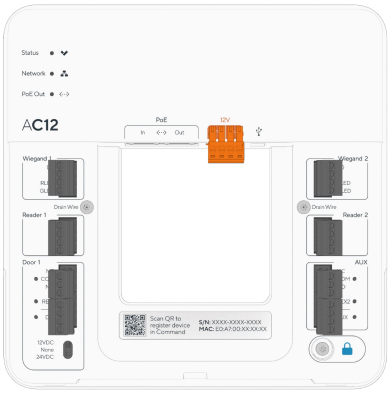
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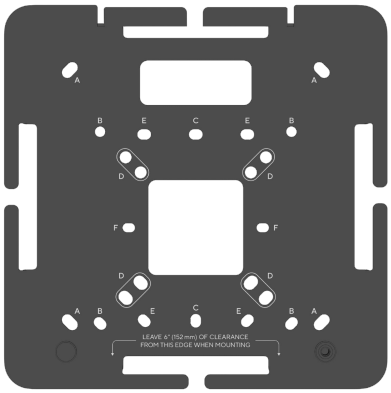
What's in the box



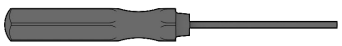
Cover
(Attached to controller)



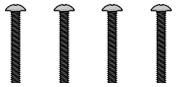
Controller



Mount Plate
(Attached to controller)



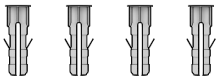
T10 Security Torx Screwdriver



#6-32 Machine Screws (4 pcs)
Length: 25.4mm **Drive:** #2 Phillips



M4 Wall Screws (4 pcs)
Length: 25mm **Drive:** #2 Phillips



Wall Anchors (4 pcs)
Length: 25mm **Drive:** NO

What you'll need

- A working internet connection
- A smartphone or laptop
- A #2 Phillips screwdriver or power drill with a #2 Phillips driver bit
- 1/4 inch (6.5mm) drill bit for wall anchors
- 1/8 inch (3mm) drill bit for pilot holes
- A shielded Cat5E or better Ethernet cable with a .2–.25 in (5-6.5mm) outside diameter
- Flathead screwdriver

Connect

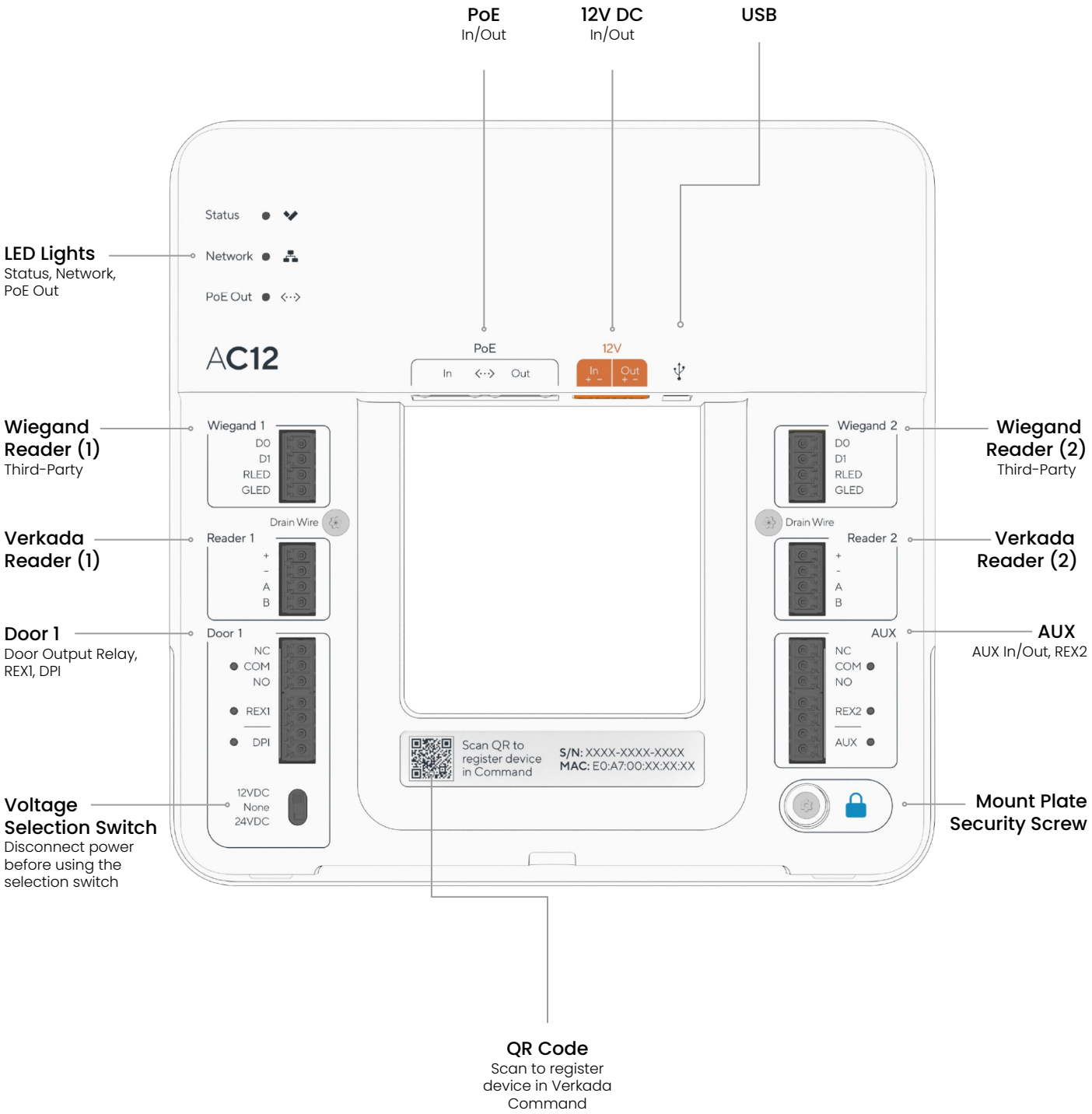
For easy registration and setup, scan the QR code on the product.

If you prefer to manually register your product, go to verkada.com/start.

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Overview



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LED Behavior 1/3





Status LED

- **Solid Blue**
  Running and healthy
- **Flashing Blue**
  Network issue. See Network LED for diagnosis.
- **Solid Orange**
  Booting up
- **Flashing Orange**
  Updating firmware
- **Solid Magenta**
  Power input is 802.3af PoE, so some functionality may be limited. See Install Guide Pg 5 for details.
- **Flashing Magenta**
  Unknown issue. Please contact our 24/7 Technical Support Team.

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LED Behavior 2/3





Network LED

The LED will flash in a specific order, depending on the error state. You will see 1 blue flash, followed by a number of orange flashes.

1 Blue, 1 Orange
Controller is connected with PoE, but unable to connect to the switch.

1 Blue, 2 Orange
Controller has not received an IP address.

1 Blue, 3 Orange
Controller is unable reach the configured Gateway.

1 Blue, 4 Orange
Controller has detected duplicate IP addresses on the LAN.



Example of **1 Blue, 5 Orange** flash sequence

1 Blue, 5 Orange
Controller is unable to resolve Verkada hostnames.

1 Blue, 6 Orange
Controller is unable to receive a response from the NTP Server.

1 Blue, 7 Orange
Controller is unable to verify the SSL connection, likely due to SSL inspection.

1 Blue, 8 Orange
Verkada endpoints are unreachable after boot up.

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LED Behavior 3/3





PoE Out LED

- **Solid Blue**
  Data and power up to 30W
- **Solid Green**
  Data and power up to 27W
- **Magenta**
  Data only
- **No Light**
  PoE Out disabled via Command
- **Blinking Amber**
  Data only. Device has been power cycled rapidly and needs to turn off PoE Out power. This usually occurs because the input power source is not able to consistently provide 802.3bt PoE++ with power up to 60W. After checking the power source for consistency, reboot the AC12 to turn PoE Out power back on. If you continue to encounter issues, please contact our 24/7 Technical Support Team.

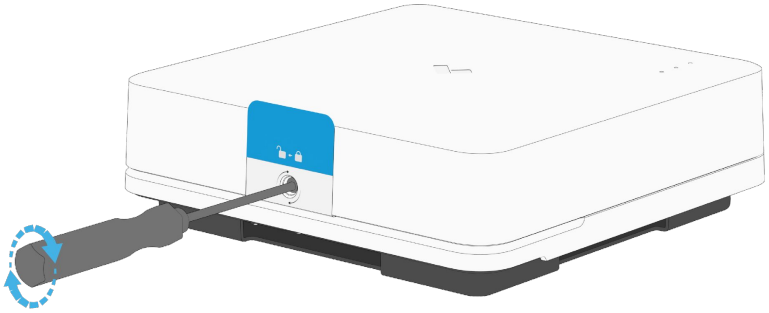
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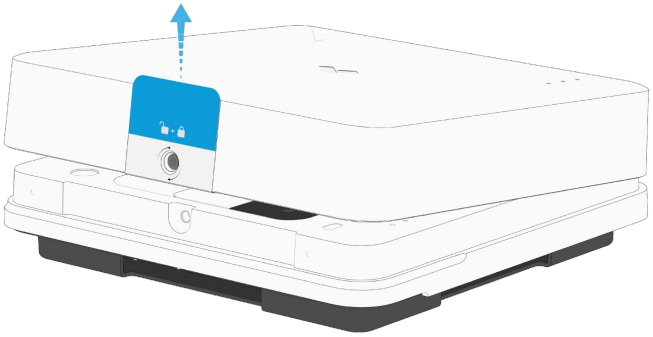
Preparation 1/2

Lay the controller on a flat surface.

Loosen the captive security screw, using the provided T10 Security Torx screwdriver.



Pull up the pull-tab to lift the cover.



Remove the sticker from the cover.

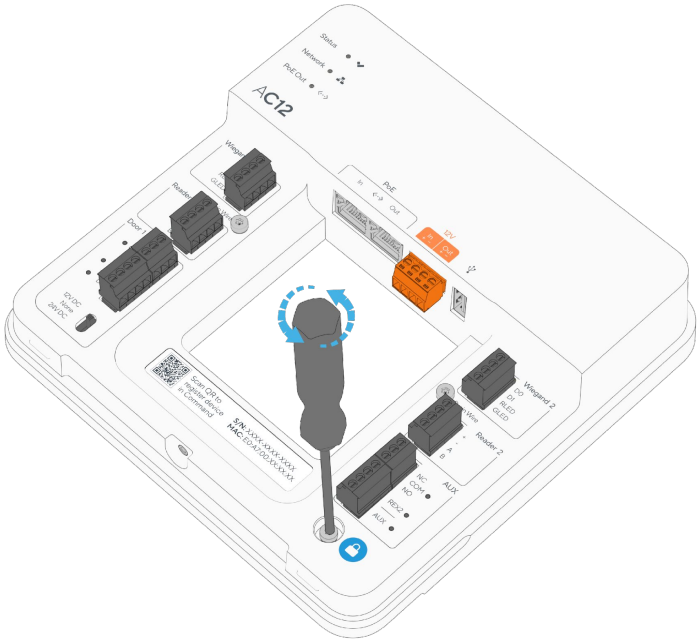


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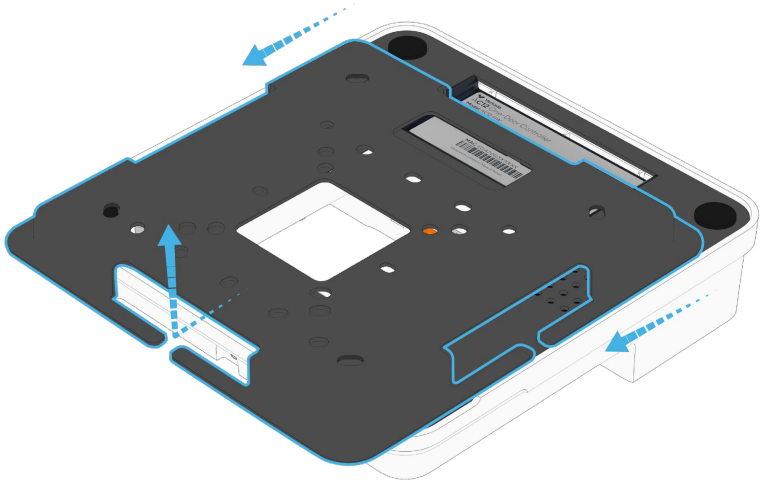
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Preparation 2/2

Use the provided T10 Security Torx screwdriver to loosen the captive security screw.



With the security screw loosened, the mount plate can slide off the controller.



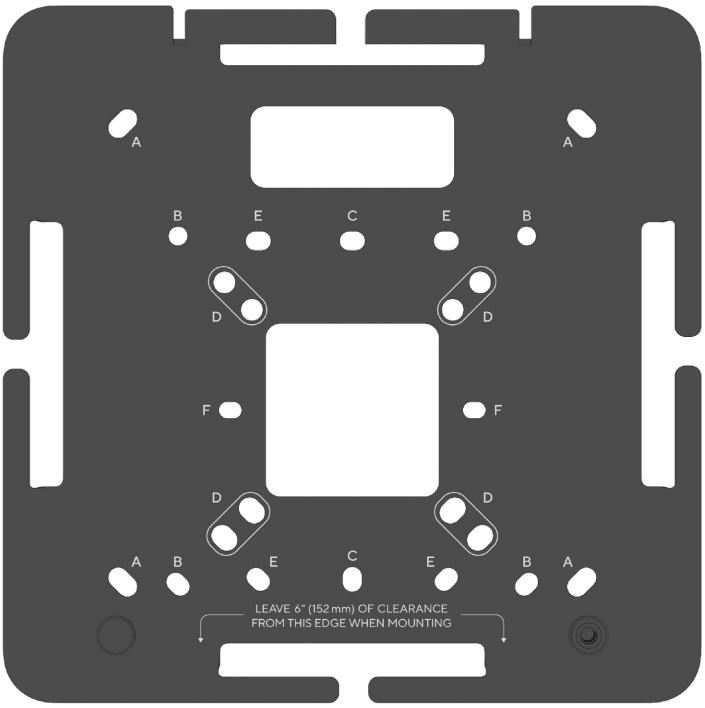
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Mount Plate

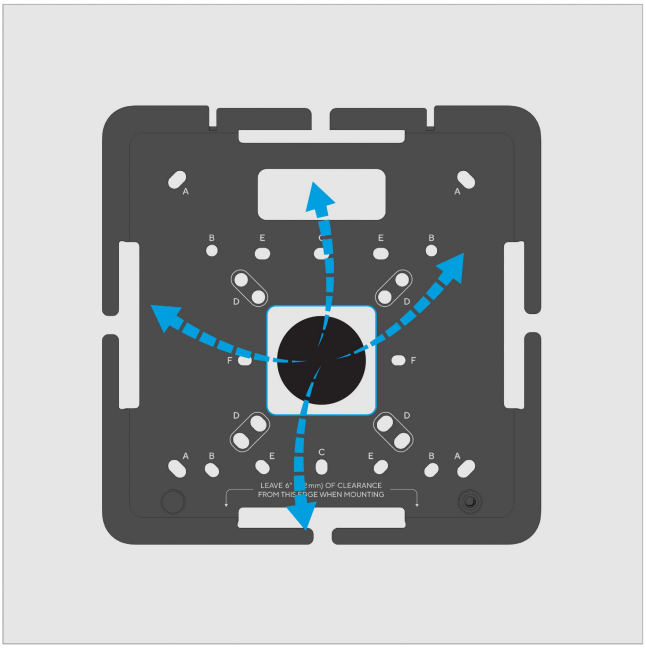
Use the mount plate as a template and mark the correct hole pattern needed.

A. Wall/Ceiling
B. Square Junction Box (4in/101.6mm)
C. Single Gang Junction Box
D. Round Junction Box (4in/101.6mm) and (3½in/88.9mm)
E. Double Gang Junction Box
F. European Junction Box

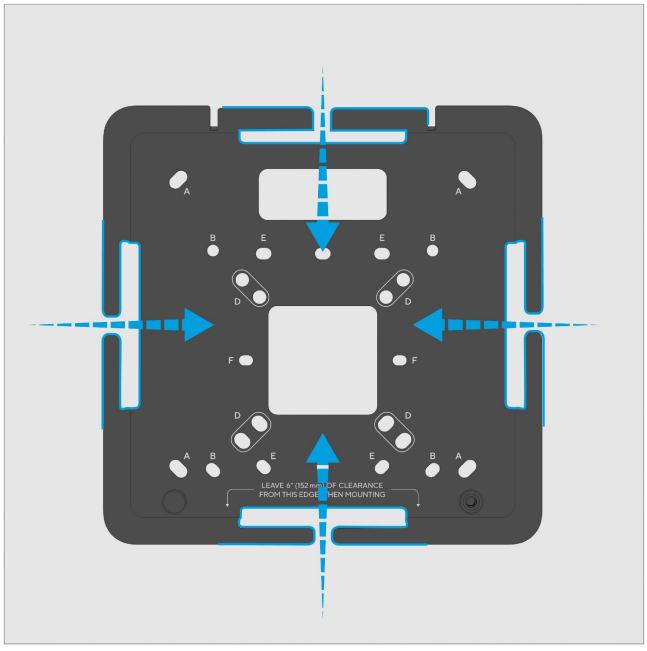


Cable Routing Options

Through mounting surface or junction box.



Along the mounting surface.

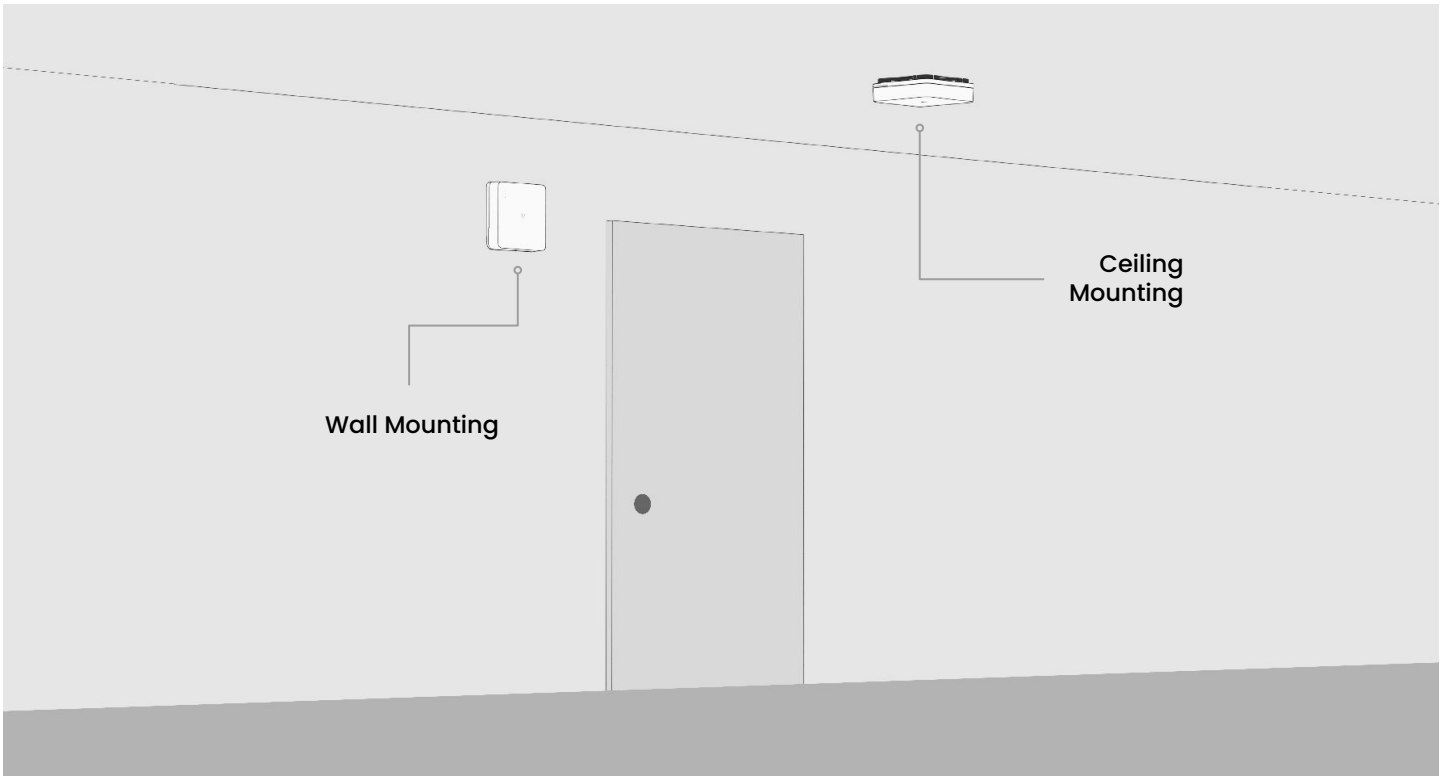


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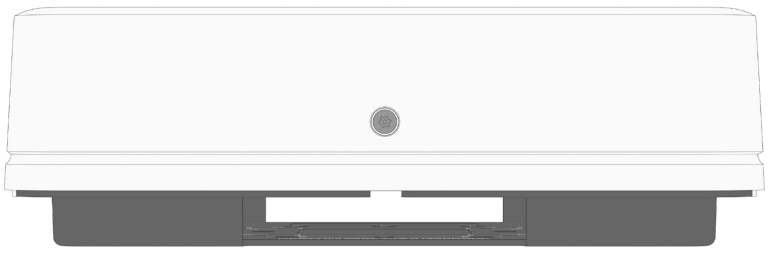
Placement

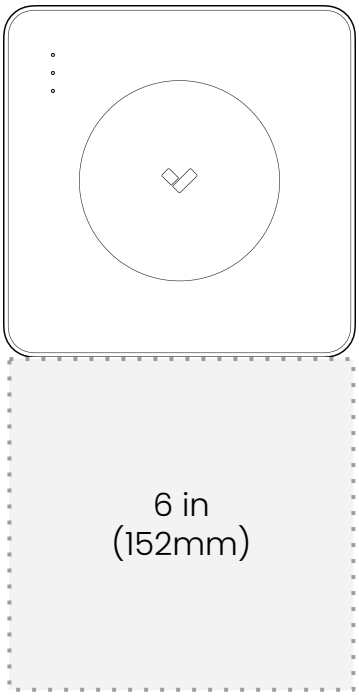
Depending on the environment and preference, AC12 can be mounted to either wall or ceiling.



Security Screw Access

To maintain unobstructed access to the captive security screw, located on the cover of the controller, be sure to leave a minimum of 6 in (152mm) of clearance from the bottom edge of the device when mounting.





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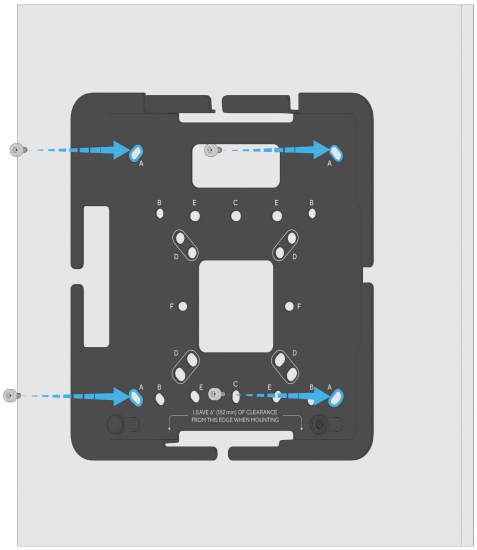
Mounting 1/2

For wall mounting, drill pilot holes using pattern ‘A’ on mount plate.

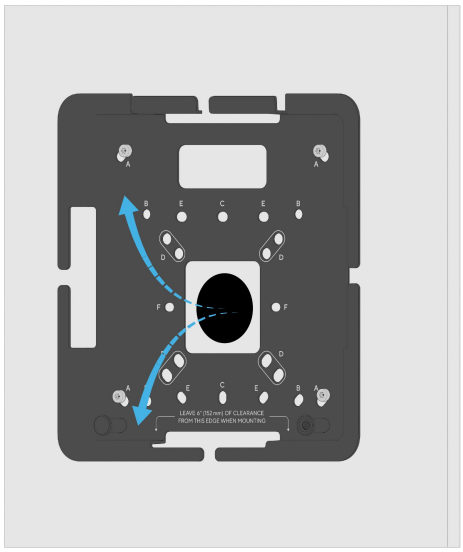
For a solid material like wood or metal, drill ⅛-in (3.17mm) pilot holes.

Drive the mounting screws directly into the pilot holes.

For drywall, plaster or masonry, separate wall anchors may be required.



Once mount plate is firmly attached to surface, bring the cables through the mount plate.



Align the hook features of the mount plate to the corresponding cavities on the controller.

Gently set the controller into position and slide it downwards.

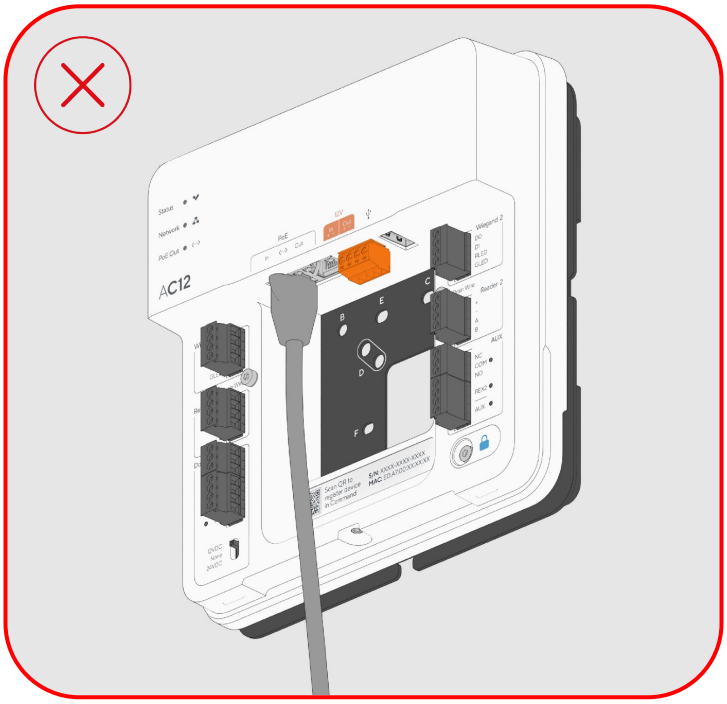


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Wiring Requirement

Do not route wires on top of controller, or cover will not be able to attach.



Ensure wires are routed in between mount plate and controller for organization and to allow cover to attach.

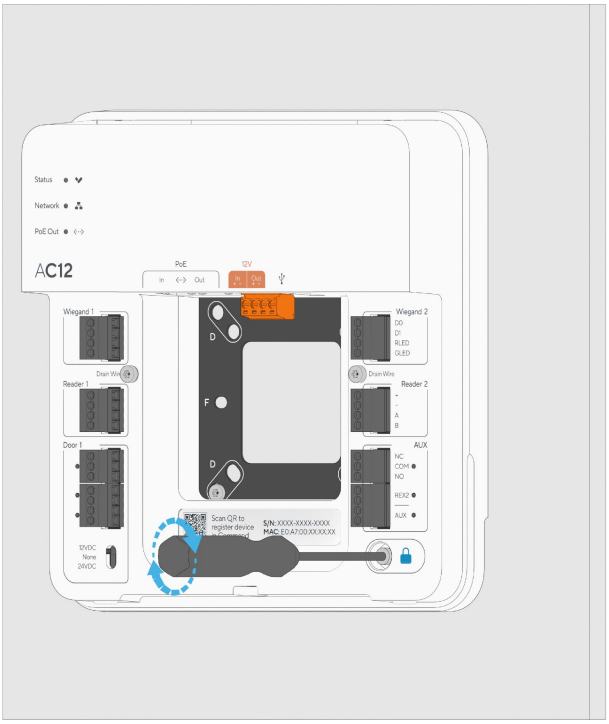


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Mounting 2/2

Secure the controller to the mount plate by tightening the captive security screw.



Detachable terminal blocks

When wiring, terminal blocks can be detached from the device for ease of installation.



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Connecting a Door 1/6

The door port's Form C relay can be driven dry or wet. AC12 is rated to power **12V locks up to 700mA and 24V locks up to 350mA.**

None/Dry
The AC12 does not provide power to the locking hardware (typically used with external power supplies).

Wet
The AC12 provides 12V or 24V power to the locking hardware.

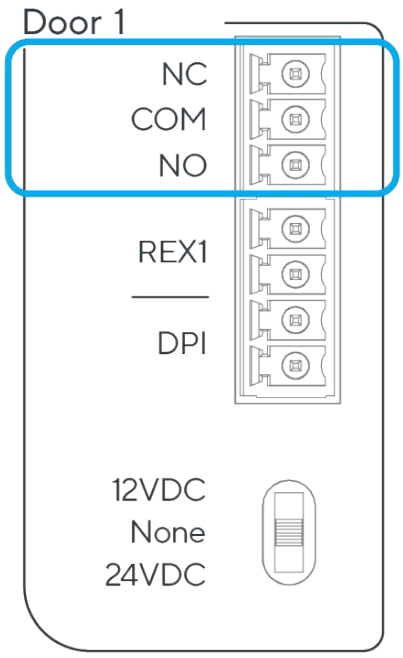
Warning ⚠

Ensure power is disconnected from the AC12 and locking hardware before wiring, removing or inserting readers, locks or any other peripherals.

1. Wire Fail Secure and Fail Safe Locking Hardware

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

- **Fail secure** hardware **locks** when power is interrupted. Typically uses Normally Open (NO) configuration.
- **Fail safe** hardware **unlocks** when power is interrupted. Typically uses Normally Closed (NC) configuration.



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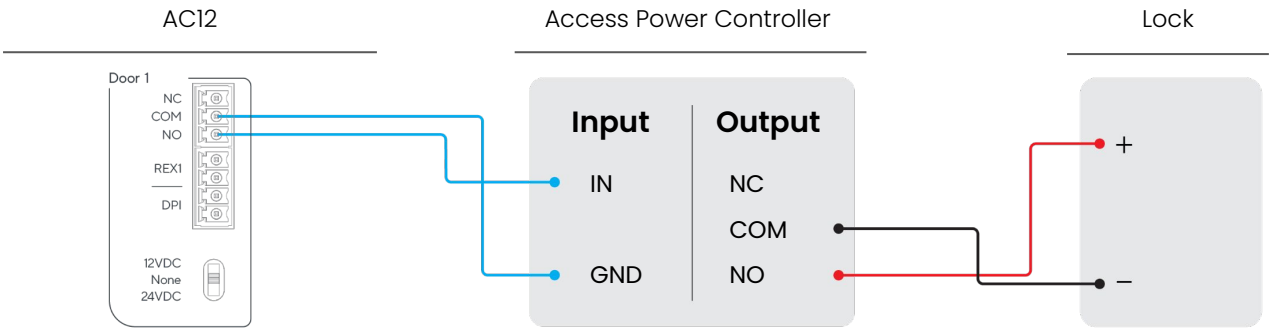
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Connecting a Door 2/6

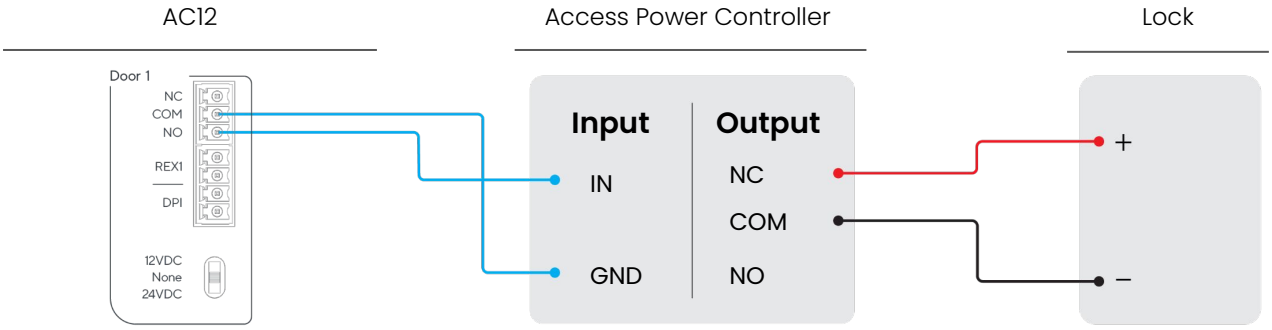
2a. Connect the Lock (Dry)

When using an external power supply which accepts a dry contact, ensure that "NONE" is selected on the door power selection switch.

Fail Secure



Fail Safe



2b. Connect the Lock (Wet)

In a Wet configuration, ensure that power selection switch is set to the correct voltage as outlined by the locking hardware specifications.

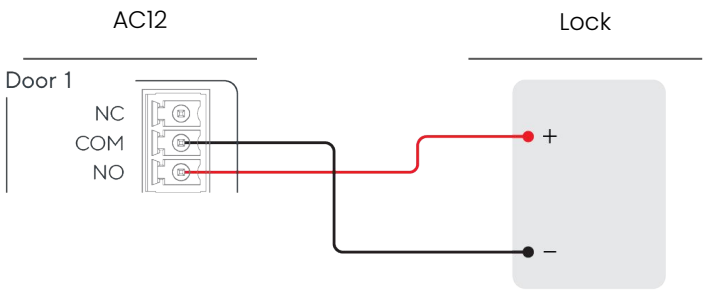
- Set it to "12VDC" for 12 volt locking hardware
- Set it to "24VDC" for 24 volt locking hardware

The AC12 is rated to power:
12V locks up to 700mA and 24V locks up to 350mA.

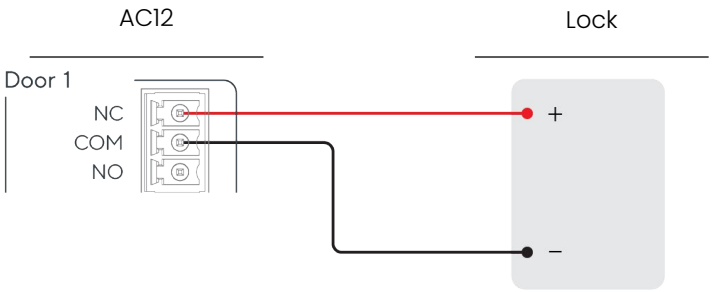
Warning ⚠

When connecting the lock in the Wet configuration, ensure the negative of the lock goes into the COM port as shown in the diagrams below.

Fail Secure
LOCK (+) positive goes into NO
LOCK (-) negative and ground wire goes into COM



Fail Safe
LOCK (+) positive goes into NC
LOCK (-) negative and ground wire goes into COM



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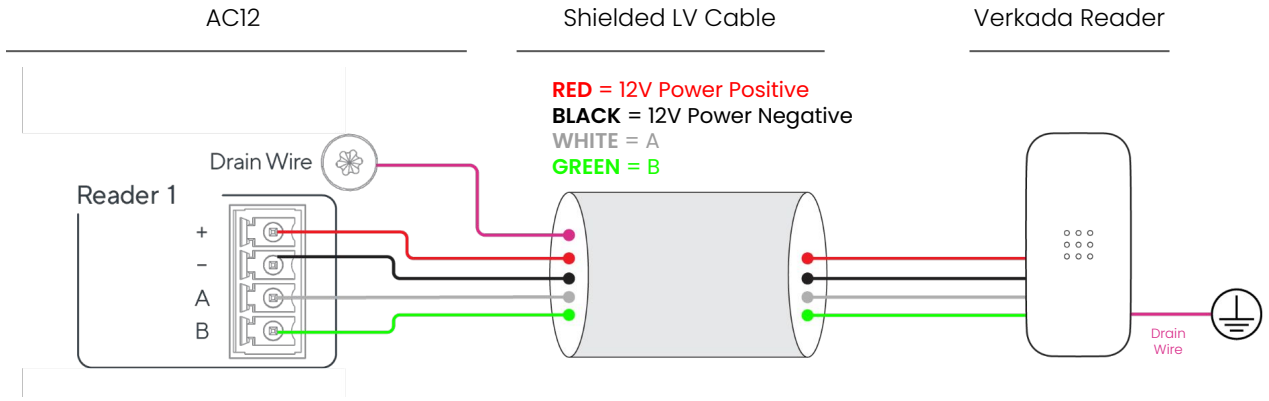
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Connecting a Door 3/6

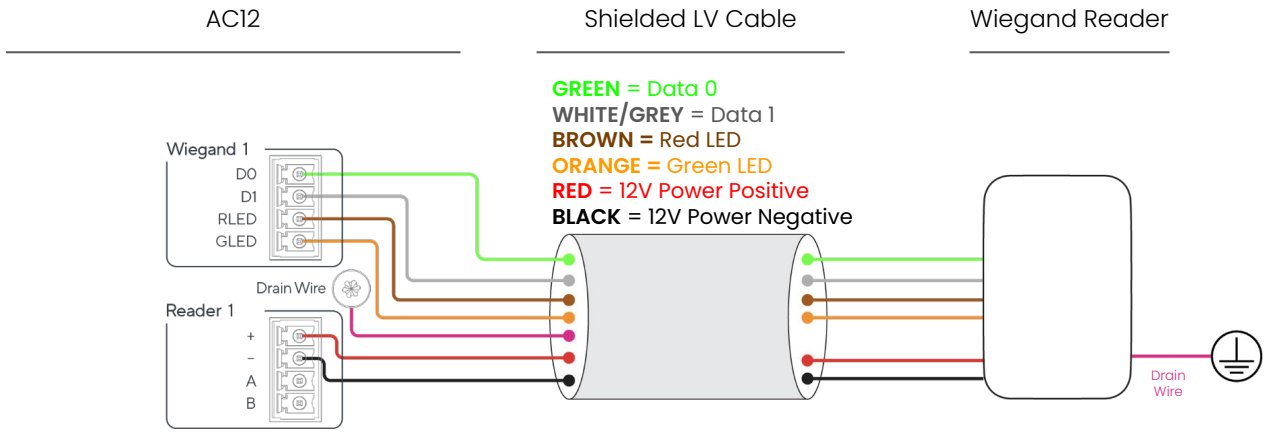
3. Connect the Reader

The AC12 is rated to power readers at 12V up to 250mA via the + (VIN) and – (GND) connection. Reader power outputs are fuse protected up to 750mA. **The reader cable shield should be secured to the nearest drain wire screw on the AC12.**

Verkada/ RS-485 Reader



Standard Wiegand Reader



Verkada/RS-485 Reader

Wire Color	Signal
Red	12V Power+
Black	12V Power-
Green	B
White	A

Wiegand Reader

Wire Color	Signal
Green	Data 0
White/Gray	Data 1
Brown	Red LED
Orange	Green LED
Red	12V Power+
Black	12V Power-

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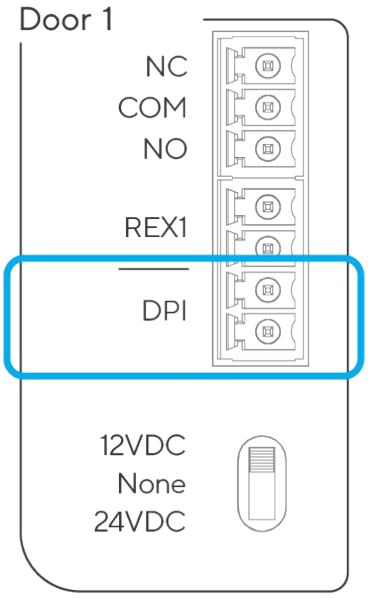
Connecting a Door 4/6

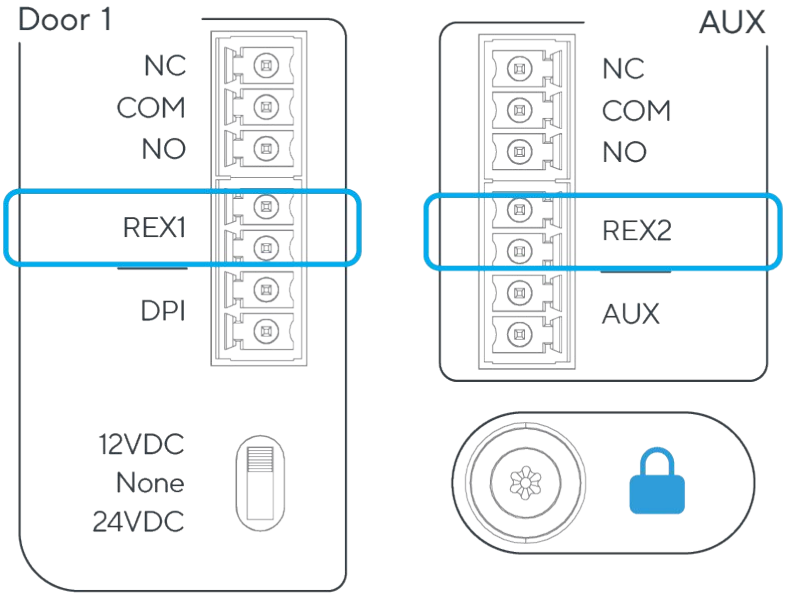
4. Connect the Inputs

Both the Door Position Indicator (DPI) and the Request-to-Exit (REX) inputs are dry contacts. Installing these inputs is optional. They can be configured in Verkada Command.

Door Position Indicator (DPI)
Verkada AC12 expects the DPI to be **NORMALLY CLOSED** (NC)

Request-to-Exit (REX)
Verkada AC12 expects the REX to be **NORMALLY OPEN** (NO)





The REX can be configured in Verkada Command to release the lock; this is most commonly seen in electromagnetic locks. The REX unlock time and normal state can be configured.

Note: If using AC12 in an exit configuration, you will need to support a form of physical egress.

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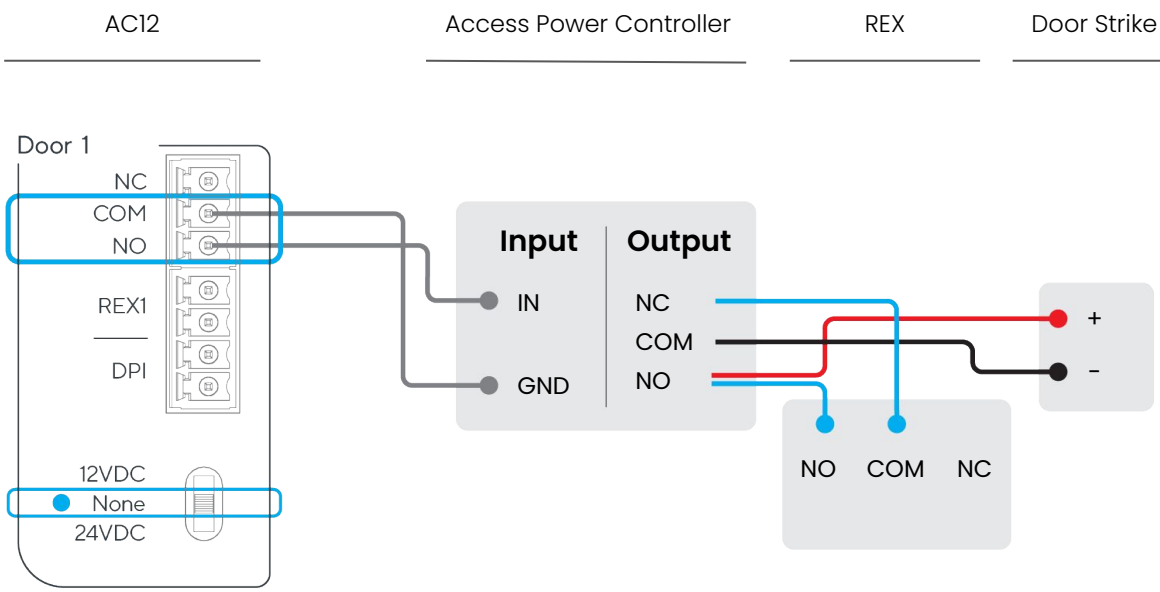
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Connecting a Door 5/6

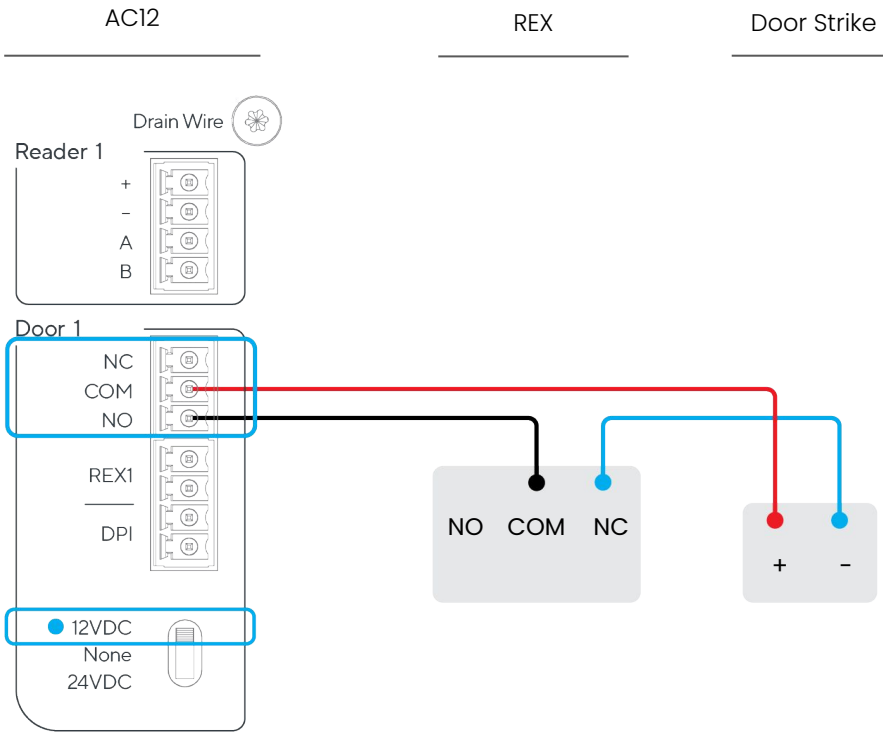
5a. Wire the REX with the Door Strike

For safety-related applications, wire the REX in parallel with the Door Strike. You can wire additional REX switches and sensors to the door cassette if needed.

Dry Configuration



Wet Configuration



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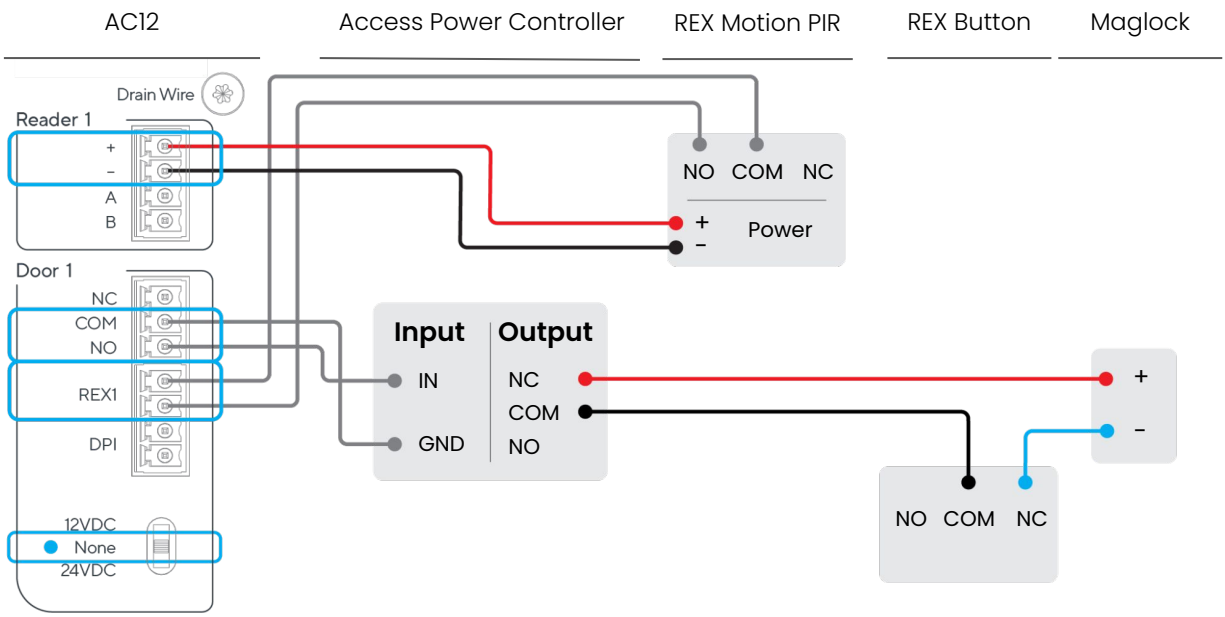
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Connecting a Door 6/6

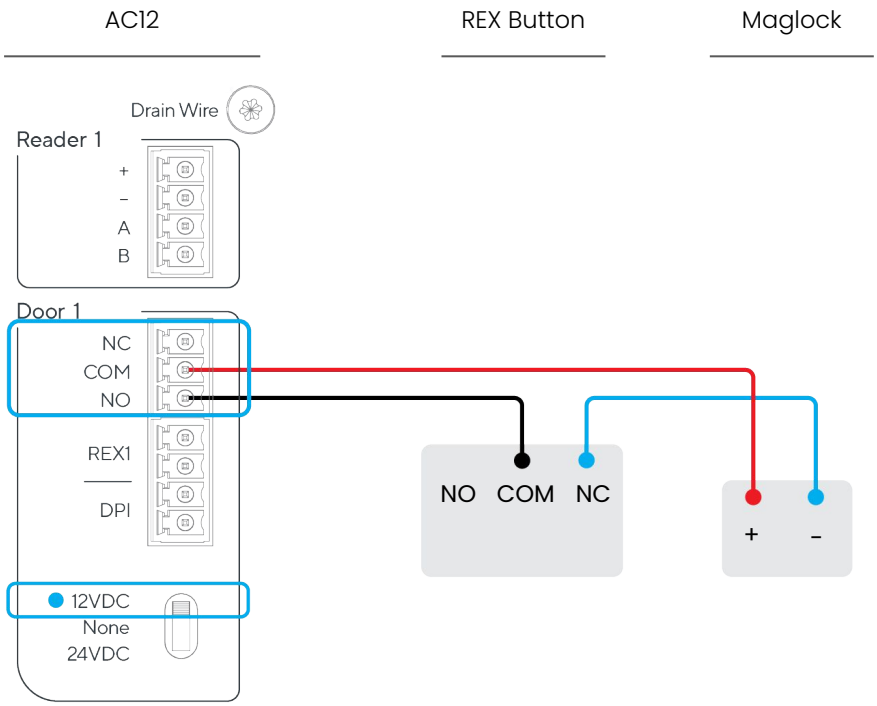
5b. Wire the REX with an Electromagnetic Lock

For safety-related applications, wire the REX directly to the maglock. You can wire additional REX switches and sensors to the door cassette, if needed.

Dry Configuration



Wet Configuration



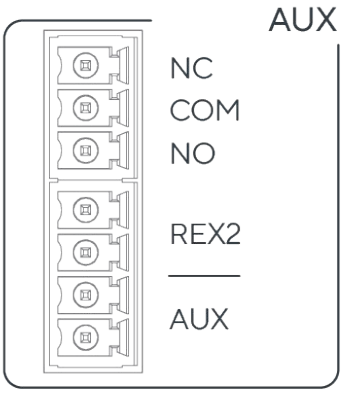
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AUX

AUX Inputs

The AC12 has one AUX input. The AC12 expects by default the AUX input is **NORMALLY OPEN (NO)**; however, this behavior can be changed to **NORMALLY CLOSED (NC)** in Verkada Command.



With the AC12's AUX input, you can connect devices such as intercoms and panic buttons. All associated events are logged in Command.

AUX inputs can be programmed in Command, including configuring a connect device to initiate a lockdown or unlock a door (or set of doors).

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Recommended Wiring

Verkada AC12 is capable of supporting Verkada Readers over RS-485 and standard Wiegand readers. The following diagram shows the wire types that are recommended for use with the Verkada AC12.

Signal	AWG	Twisted Pair	Conductor	Shielded	Max Length
Reader Option 1 (22 AWG)	22	Yes		Yes	250 ft (76.2m)
Reader Option 2 (20 AWG)	20	Yes		Yes	300 ft (91.4m)
Reader Option 3 (18 AWG)	18	Yes		Yes	500 ft (152m)
Power (22 Gauge)	22		Yes	Yes	600 ft (183m)
Power (18 Gauge)	18		Yes	Yes	1,500 ft (457m)
Request-to-Exit	22/18		Yes	Yes	1,500 ft (457m)
Door Contact	22		Yes	Yes	1,500 ft (457m)

Shield Wiring and Grounding Requirements

You must use shield wiring with the AC12, particularly for the card reader:

- Connect the drain wire (bare metal) from the reader cable bundle to the drain wire in the shielded cabling. Then, connect the drain wire at the other end of the shielded cabling to AC12 drain wire screw.
- Improper grounding and shielding may result in unintended product behavior.

You must use a Cat 5e or better shielded cable for PoE In and Out ports.

You must use a UL294 certified injector that is compliant with IEEE 802.3 PoE standards to power AC12.

You must use twisted pair for power (+/-) and twisted pair for the data (D0/D1 or A/B).

Wiring methods shall be in accordance with National Electrical Code, ANSI/NFPA 70, local codes, and the authorities having jurisdiction..

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Required Network Settings

An Ethernet connection with the Dynamic Host Configuration Protocol (DHCP) must be used to connect the AC12 to the Local Area Network (LAN). You also need to configure firewall settings to communicate with the AC12.

- TCP port 443
- UDP port 123 (NTP time synchronization)
- Multi-Media Access Control (MAC) address presence for single port in passthrough mode

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Anti-Passback

The AC12 supports anti-passback, allowing you to increase the security of an area by ensuring that a user properly enters the area before exiting, and properly exits the area before entering again.

Using anti-passback, you can prevent a user from entering an area and then passing their badge back to someone else to use to enter the same area. Additionally, anti-passback can help enforce a badge-out policy, whereby a user must badge when exiting an area or else they will violate anti-passback when they try to re-enter.

Anti-passback rules are based on the configuration of an access control area. An access control area is configured for a site, and is defined by a set of entrance doors and exit doors.

To set up anti-passback, follow the guides below in this order:

1. First, configure an access control area.
2. Then, secure the access control area with anti-passback.

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Registering a Device

1. Connect the AC12 to your network using the Ethernet port located at the bottom of the controller.
2. Connect the AC12 power supply to your standard power outlet (100–240VAC).

To add the AC12 to your Verkada Command account, enter the serial number printed on the AC inlet (or the order number) to the **Add Device** page at command.verkada.com/add-device.



Serial Number
QR Code

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Appendix

Compliance

FCC Statement	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. 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. **FCC Caution:** Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
IC Statement	This device complies with ISED's licence-exempt RSSs. 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. Le présent appareil est conforme aux CNR d' ISED applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.
UL 294	Attack Level/Grade: Level 1 Endurance Level/Grade: Level 1 Line Security Level/Grade: Level 1 Standby Power Level/Grade: Level 1
CAN-ULC 60839-11-1	Environmental Level: Indoor Grade Assignment: Grade 1

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Appendix

Support

Thank you for purchasing this Verkada product. If for any reason things don't work right, or you need assistance, please contact us immediately.

verkada.com/support
Sincerely, The Verkada Team

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