Manuals+ — User Manuals Simplified.

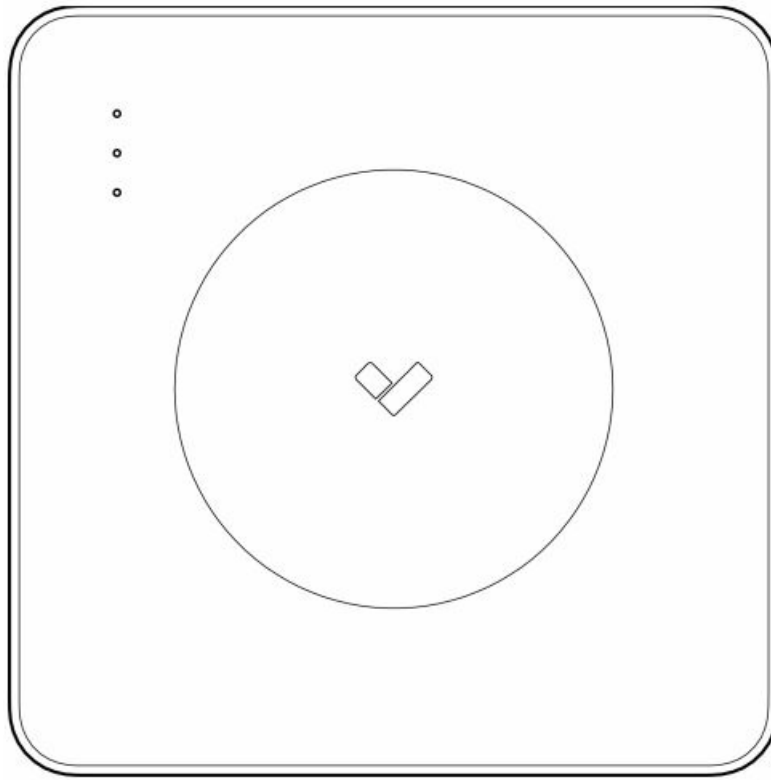# Verkada AC12 One Door Controller Installation Guide

Contents

Verkada AC12 One Door Controller

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 PoE Output: 2x 12VDC @ 250mA reader ports (Verkada/RS-485 or Wiegand)
- Relay Outputs:
    - 1x wet relay for door with switch-selectable power:
        - 12VDC operation @ 700mA maximum
        - 24VDC operation @ 350mA maximum
        - Dry operation
    - 1x dry relay for auxiliary output with maximum pass-through power 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: Indoor Use Only
- Compliance: FCC Part 15B Class B, ICES-003 Class B, CE, UKCA, VCCI, RCM, UL 294, CAN-ULC 60839-11-1, UL 62368-1, CSA C22.2 No. 62368-1, IK06, Compliant with Requirements of UL2043
- Connectivity: Ethernet (10/100/1000 Mbps RJ-45) for network connection, USB 2.0

Installation and Maintenance

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:

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

Mounting Options

The AC12 One-Door Controller can be mounted on the wall, ceiling, or plenum.

Included Accessories

- T10 Security Torx screwdriver
- Mounting hardware kit

FAQ

Q: Can the AC12 be used outdoors?

A: No, the AC12 is designed for indoor use only.

Q: How many readers can be powered by each reader port?

A: Each of the 2 reader ports can power a maximum of 1 reader with current consumption of at most 250mA.

Q: What is the maximum pass-through power for the auxiliary output?

A: The auxiliary output has a maximum pass-through power of 24VDC @ 2A (resistive load).

Document

Document Details
V1.0 (20231031)
(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: Outdoor
- Grade Assignment: Grade 1

Introduction

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

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 1x dry relay for auxiliary output with maximum pass-through power 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

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
	12VDC @ 700mA max	12VDC @ 700mA max	12VDC @ 700mA max	12VDC @ 500mA max	12VDC @ 700mA max
Wet Lock	or	or	or	or	or
	24VDC @ 350mA max	24VDC @ 350mA max	24VDC @ 350mA max	24VDC @ 250mA max	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

What's in the box

Cover
(Attached to controller)

Controller
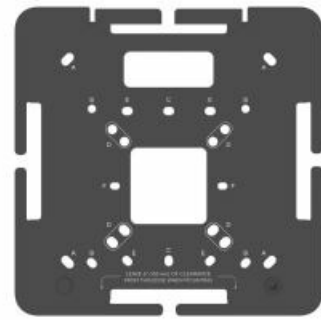
Mount Plate
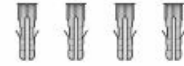(Attached to controller)

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)
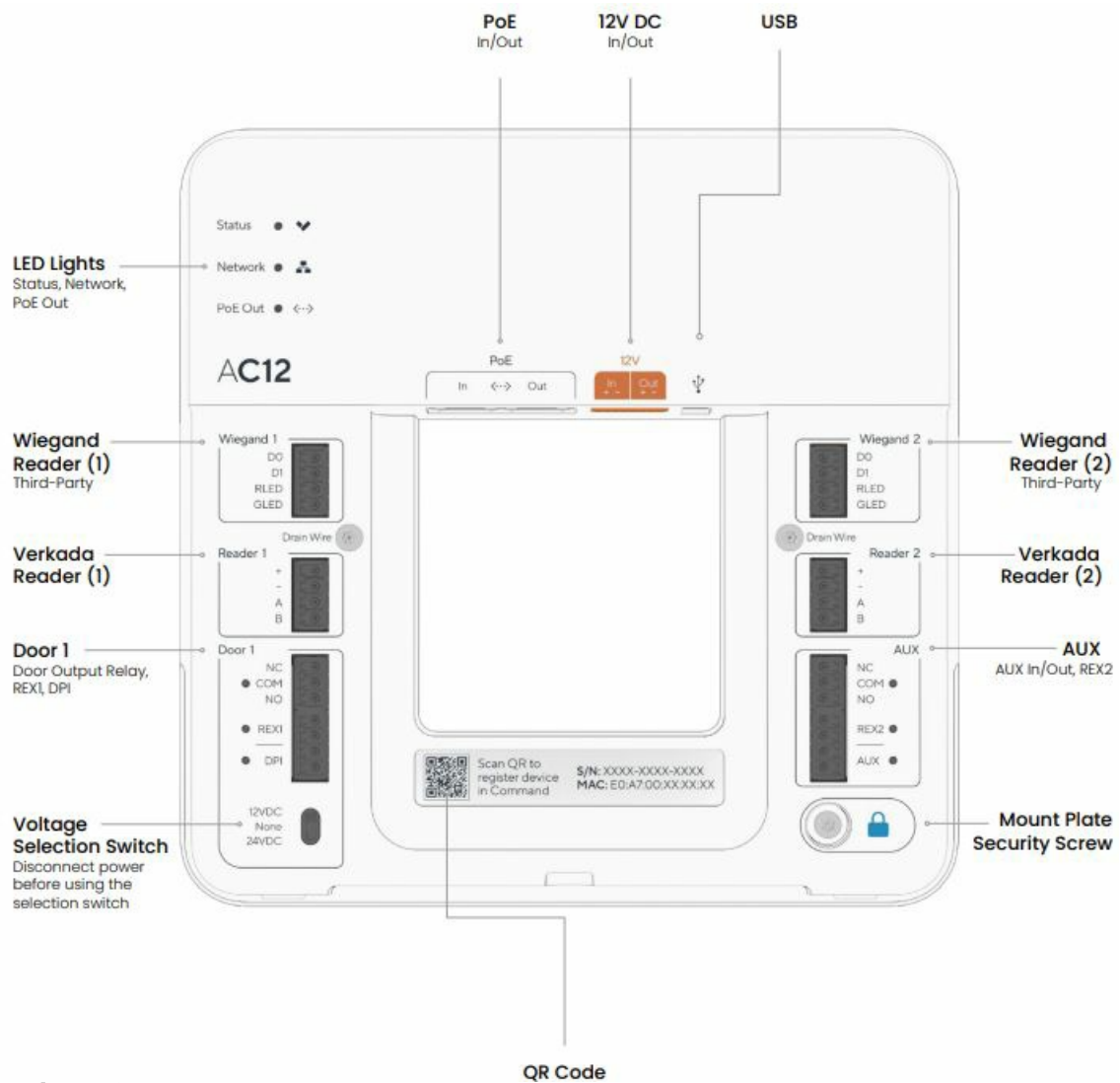Length: 25mm Drive: NO

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
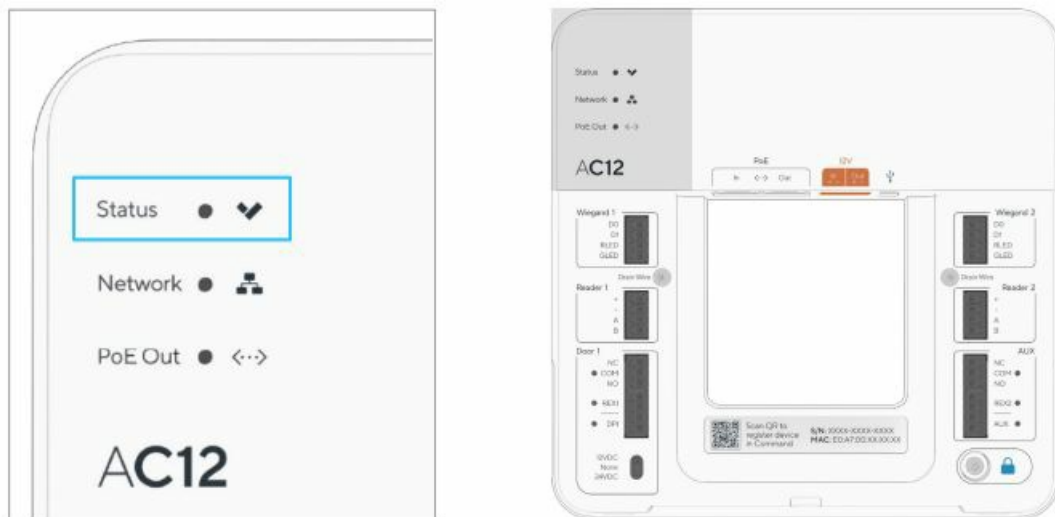- Flathead screwdriver

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**.

Overview

PoE In/Out   **12V DC** In/Out   **USB**

Status ●

Network ●

PoE Out ●

LED Lights
Status, Network, PoE Out

AC12

PoE   12V

In ⟷ Out

Wiegand Reader (1)
Third-Party

Wiegand 1
DO
D1
RLED
GLED

Verkada Reader (1)

Reader 1
+
−
A
B

Drain Wire

Door 1
Door Output Relay, REX1, DPI

Door 1
NC
● COM
NO

● REX1

● DPI

12VDC
None
24VDC

Voltage Selection Switch
Disconnect power before using the selection switch

Wiegand 2
DO
D1
RLED
GLED

Wiegand Reader (2)
Third-Party

Drain Wire

Reader 2
+
−
A
B

Verkada Reader (2)

AUX
NC
COM
NO

REX2

AUX

AUX
AUX In/Out, REX2

Scan QR to register device in Command   S/N: XXXX-XXXX-XXXX   MAC: E0:A7:00:XX:XX:XX

🔒

Mount Plate Security Screw

QR Code

LED Behavior 1/3

Status ●

Network ●

PoE Out ●

AC12

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.

LED Behavior 2/3
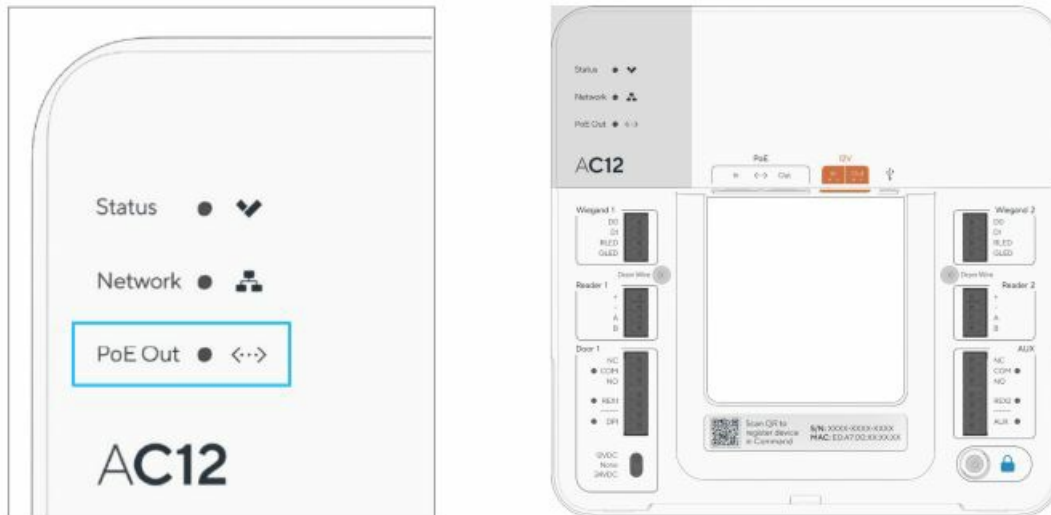
Network LED

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**

  Camera is connected with PoE, but unable to connect to the switch.

- **1 Blue, 2 Orange**

  Camera has not received an IP address.

- **1 Blue, 3 Orange**

  Camera is unable reach the configured Gateway.

- **1 Blue, 4 Orange**

  Camera has detected duplicate IP addresses on the LAN.

Example of 1 Blue, 5 Orange flash sequence

- **1 Blue, 5 Orange**

  Camera is unable to resolve Verkada hostnames.

- **1 Blue, 6 Orange**

  Camera is unable to receive a response from the NTP Server.

- **1 Blue, 7 Orange**

  Camera is unable to certify the SSL connection, likely due to SSL inspection.

- **1 Blue, 8 Orange**

  Verkada endpoints are unreachable after boot up.

LED Behavior

PoE Out LED

Solid Blue
Data and power up to 30W

Solid Green
Data and power up to 27W

Magenta
Data only

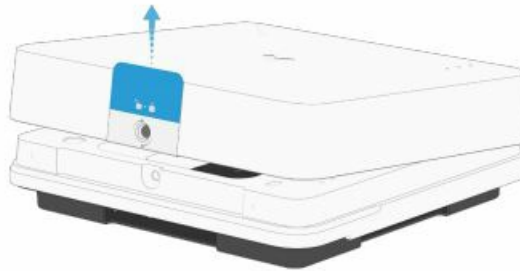**No Light**
PoE Out disabled via Command

Blinking Amber
Data only

Installation

Preparation

- 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.

- 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.

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

- A Direct wall/ceiling mount
- B Square Junction Box (4 in [101.6mm]) C Single Gang Junction Box
- D Round Junction Box (4 in [101.6mm) and 3½ in[88.9mm])
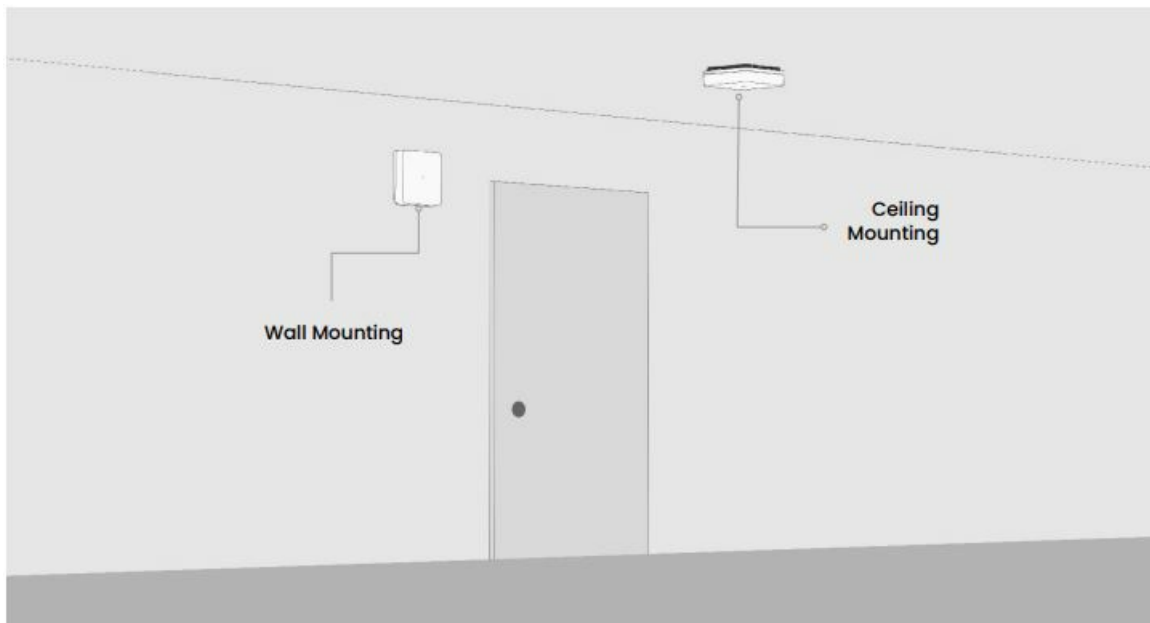- E Double Gang Junction Box
- F European Junction Box
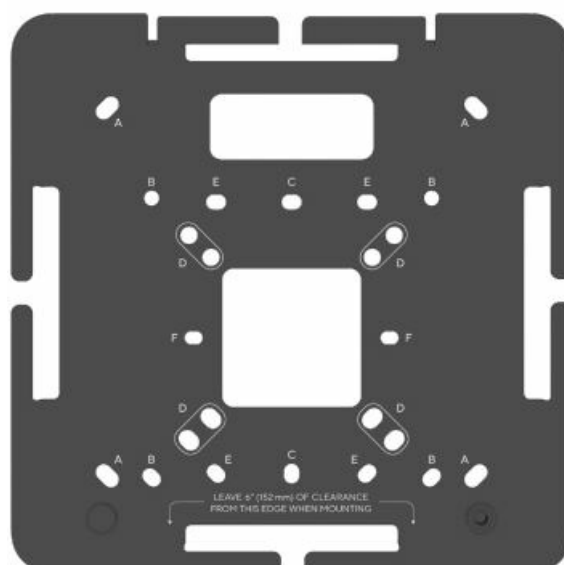
Cable Routing Options

- Through mounting surface or junction box
- Along the mounting surface
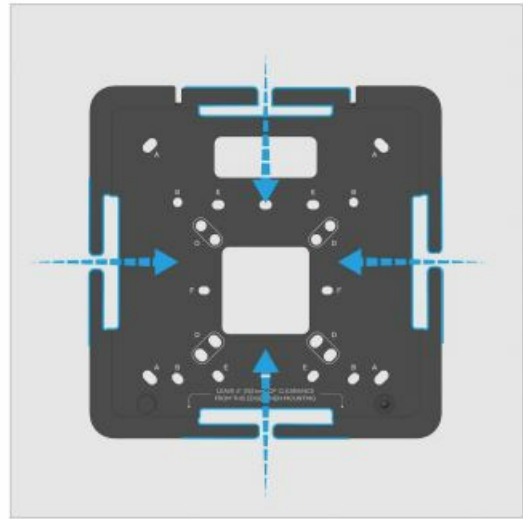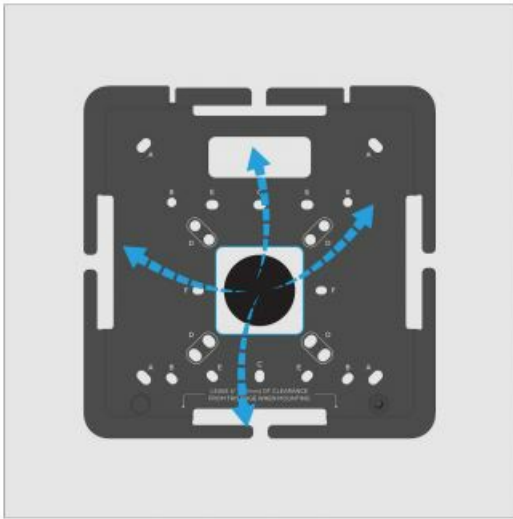
Placement
Depending on the environment, and preference, AC12 can be mounted to either wall or ceiling.


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.

6 in
(152mm)

Mounting

- 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.
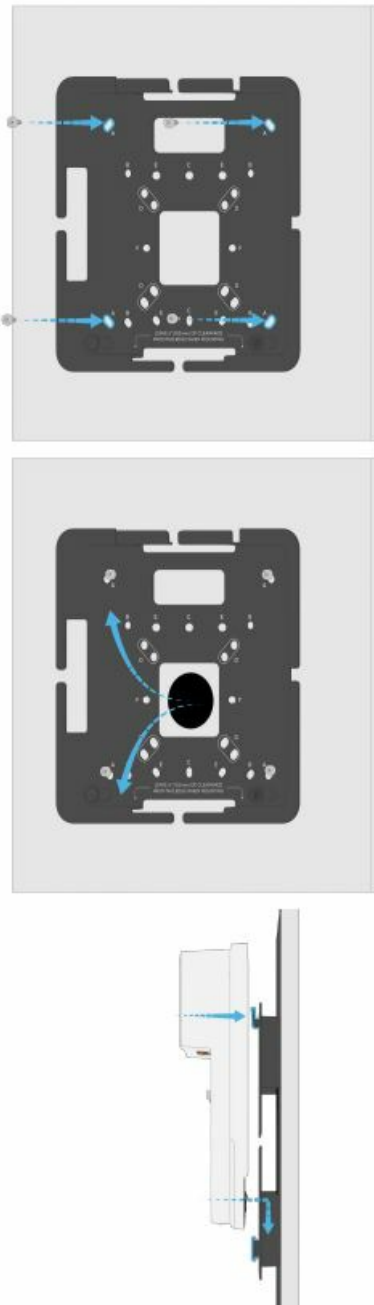
Wiring Requirement

- 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.

- **Mounting**

  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.

Connecting a Door

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.

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.
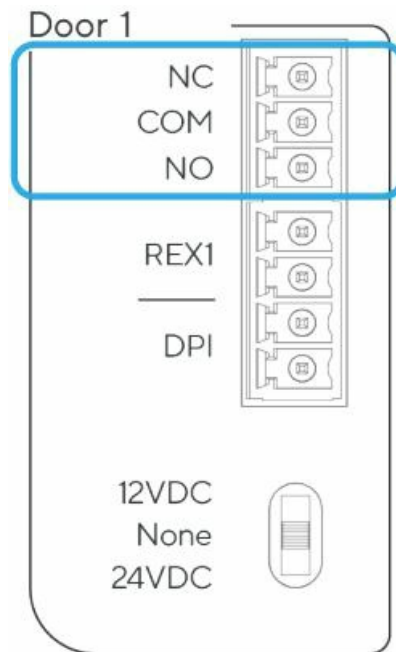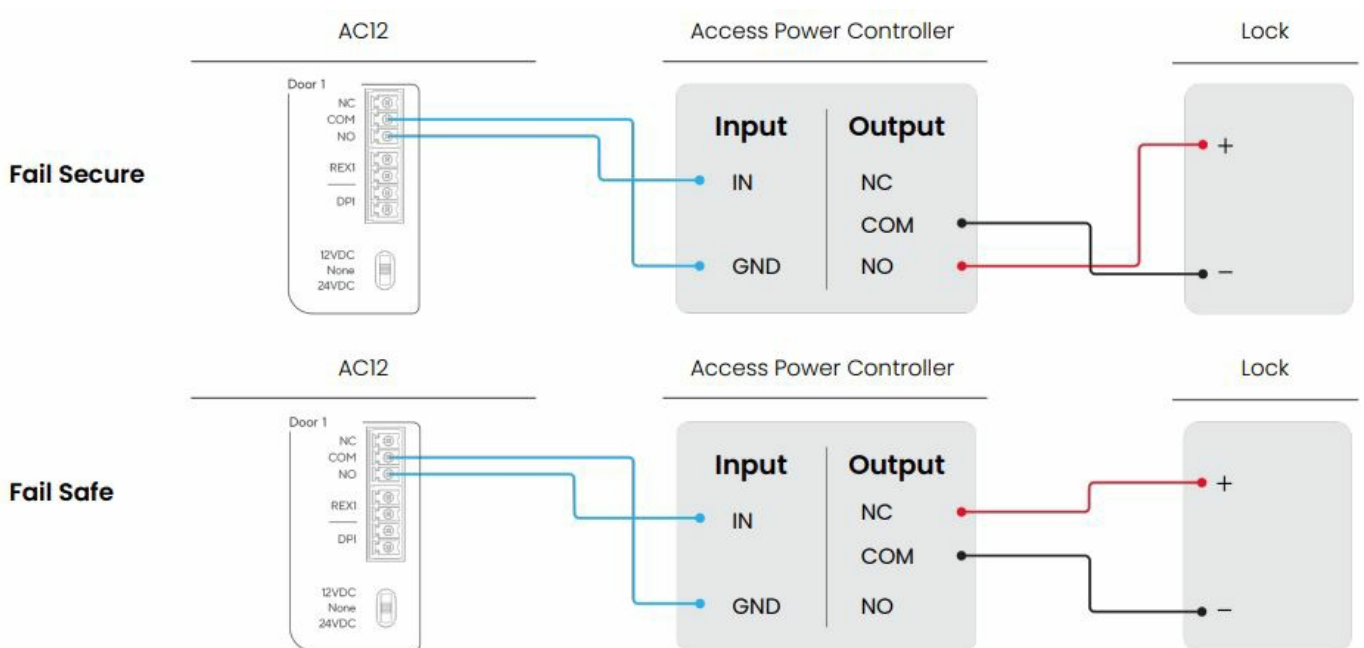
Warning

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

Connecting a Door

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.

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.
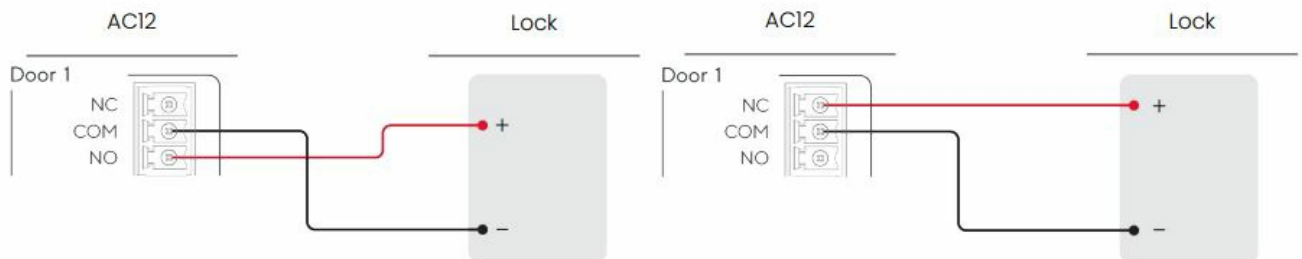

Fail Secure
LOCK (+) positive goes into NO
LOCK (−) negative and ground wire goes into COM

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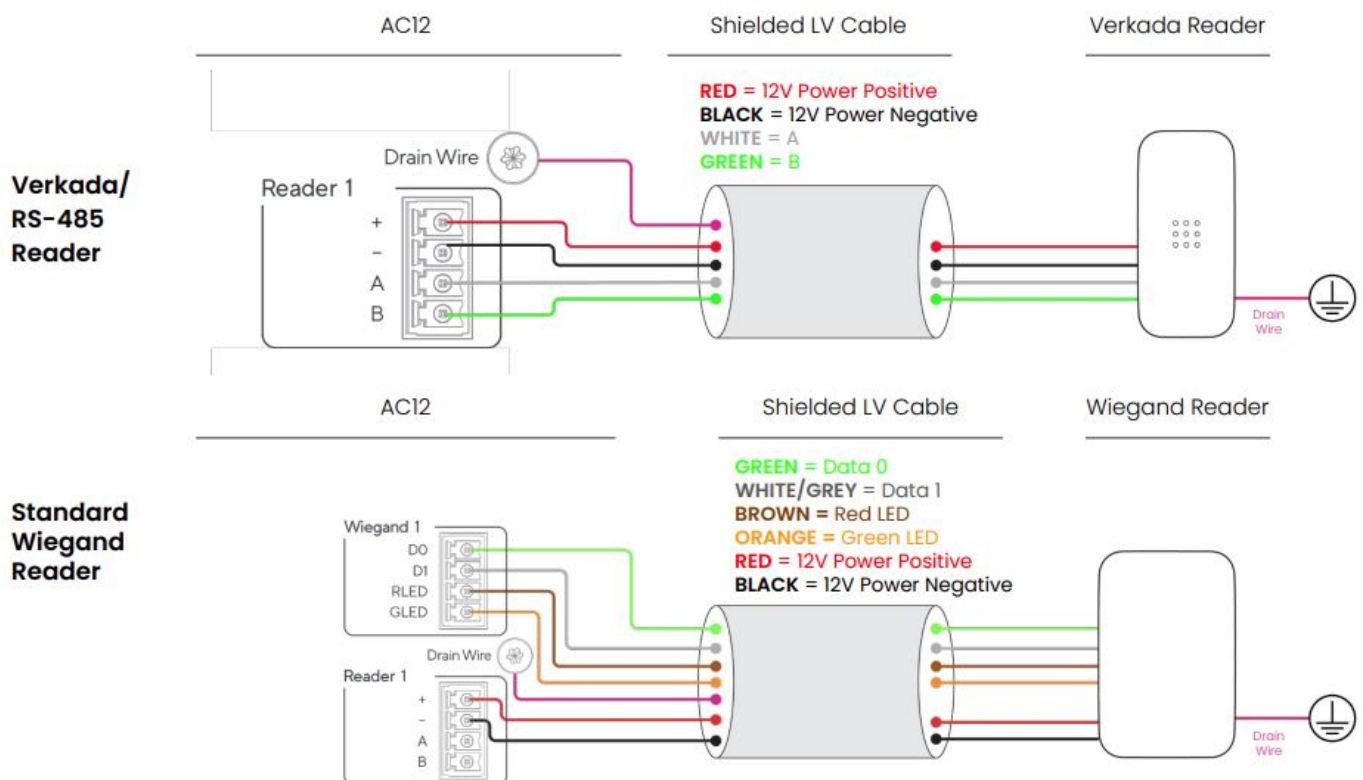LOCK (+) positive goes into NC
LOCK (−) negative and ground wire goes into COM

Connecting a Door

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

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-

Connecting a Door

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.
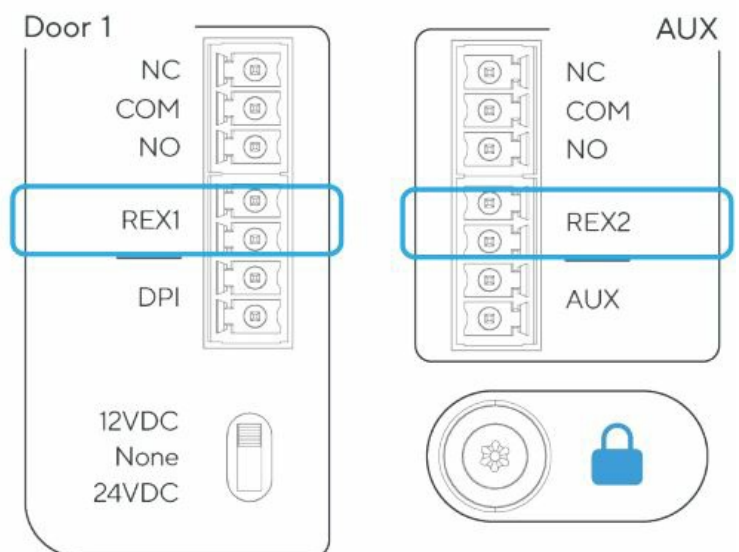

Door Position Indicator (DPI)
Verkada AC12 expects the DPI to be **NORMALLY CLOSED** (NC)
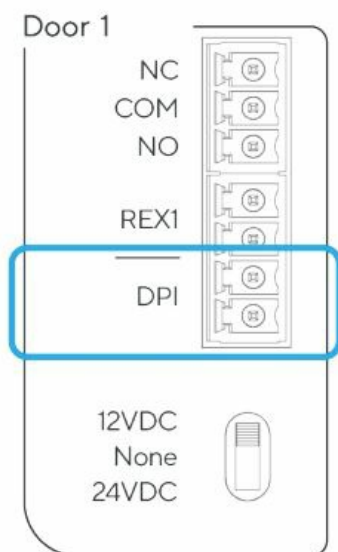
Request-to-Exit (REX)
Verkada AC12 expects the REX to be **NORMALLY OPEN** (NO)

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 security egress.

**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.
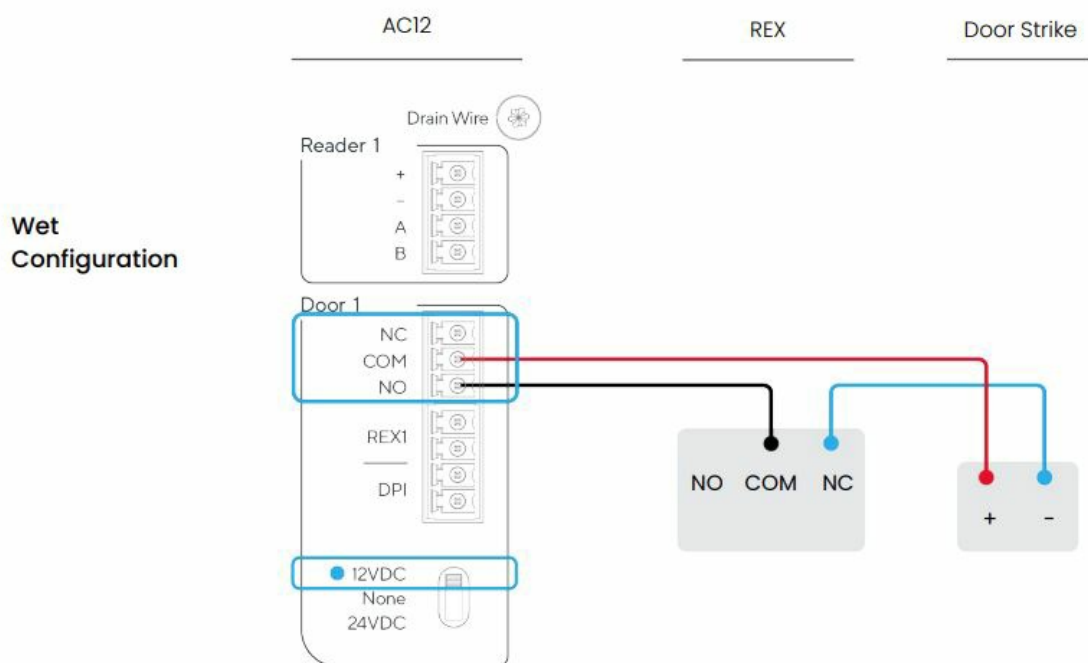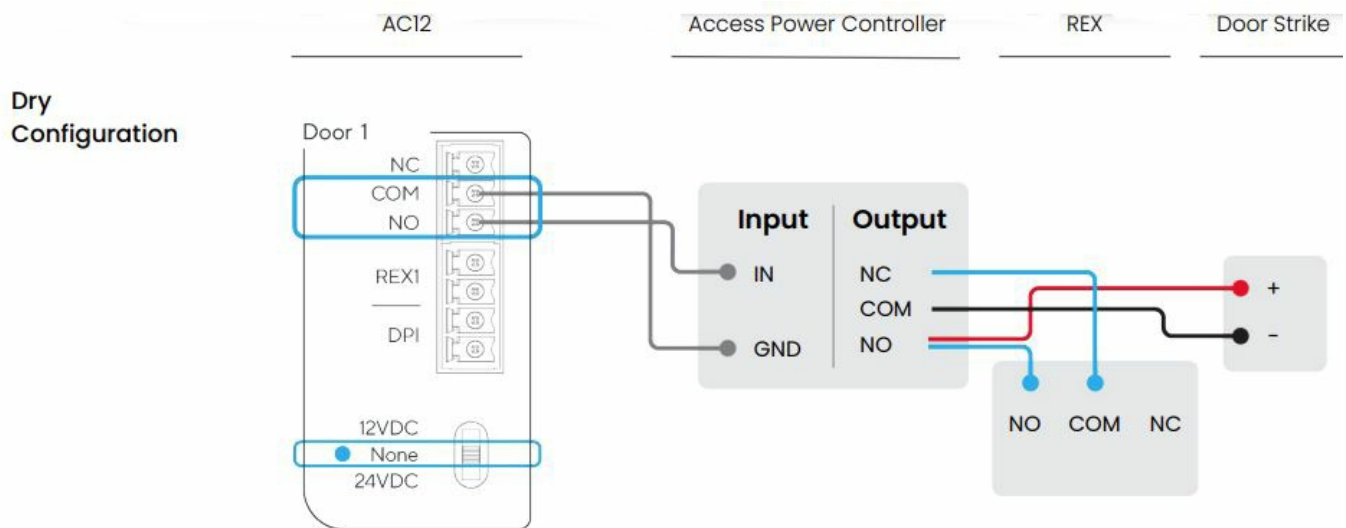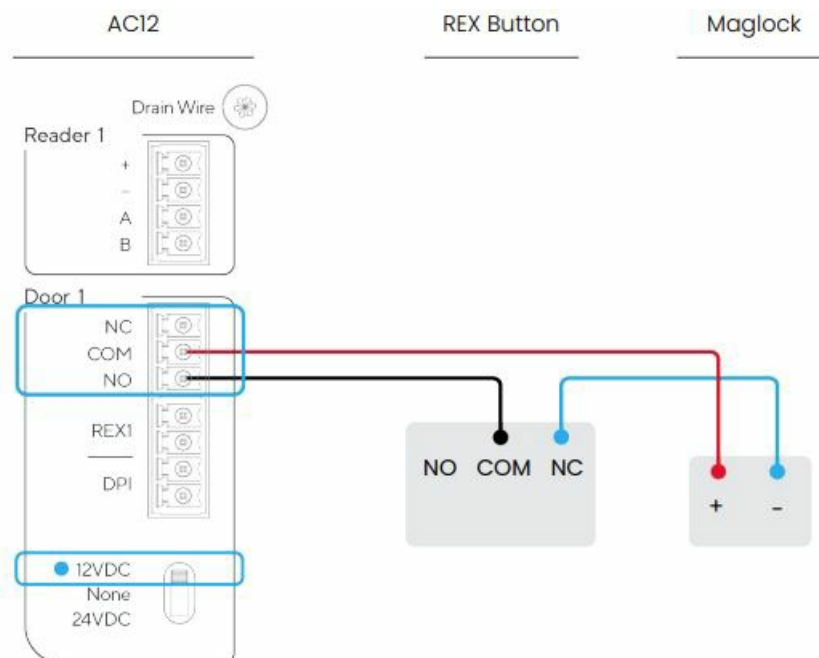

Wire the REX with an Electromagnetic Lock
For safety-related applications, wire the REX directly to the maglock. You can wire additional REX switches and sensors to the door cassette, if needed.
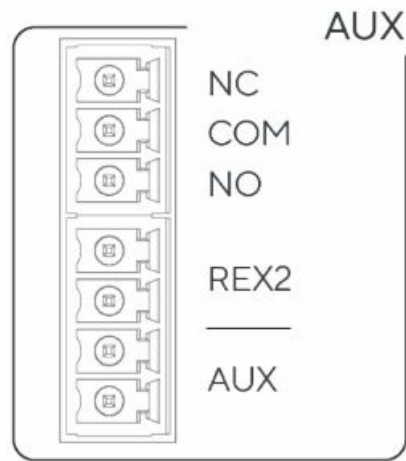
Dry Configuration
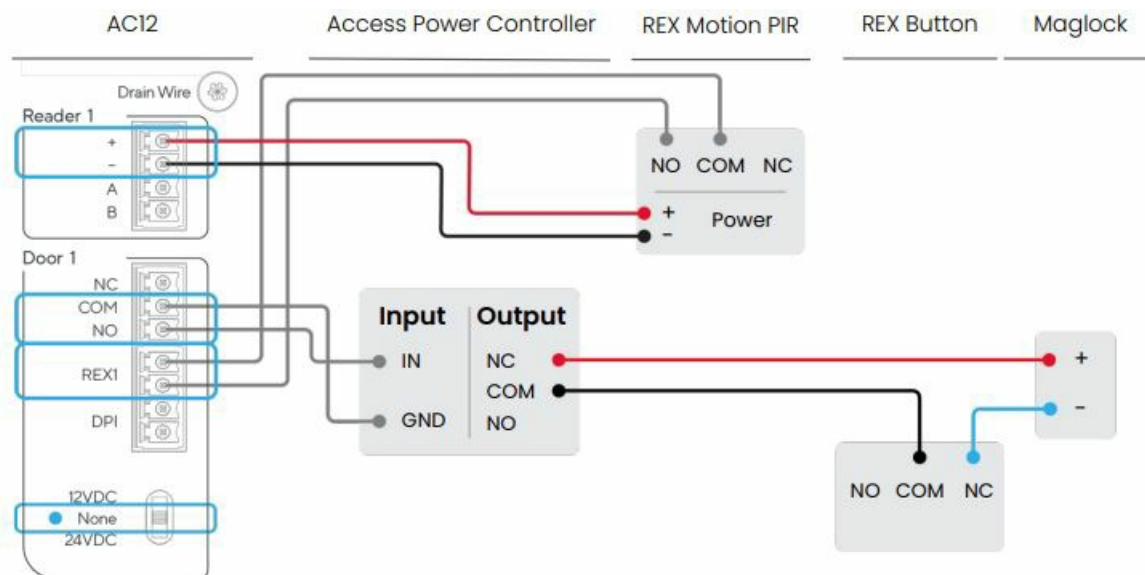
Wet Configuration

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).

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..
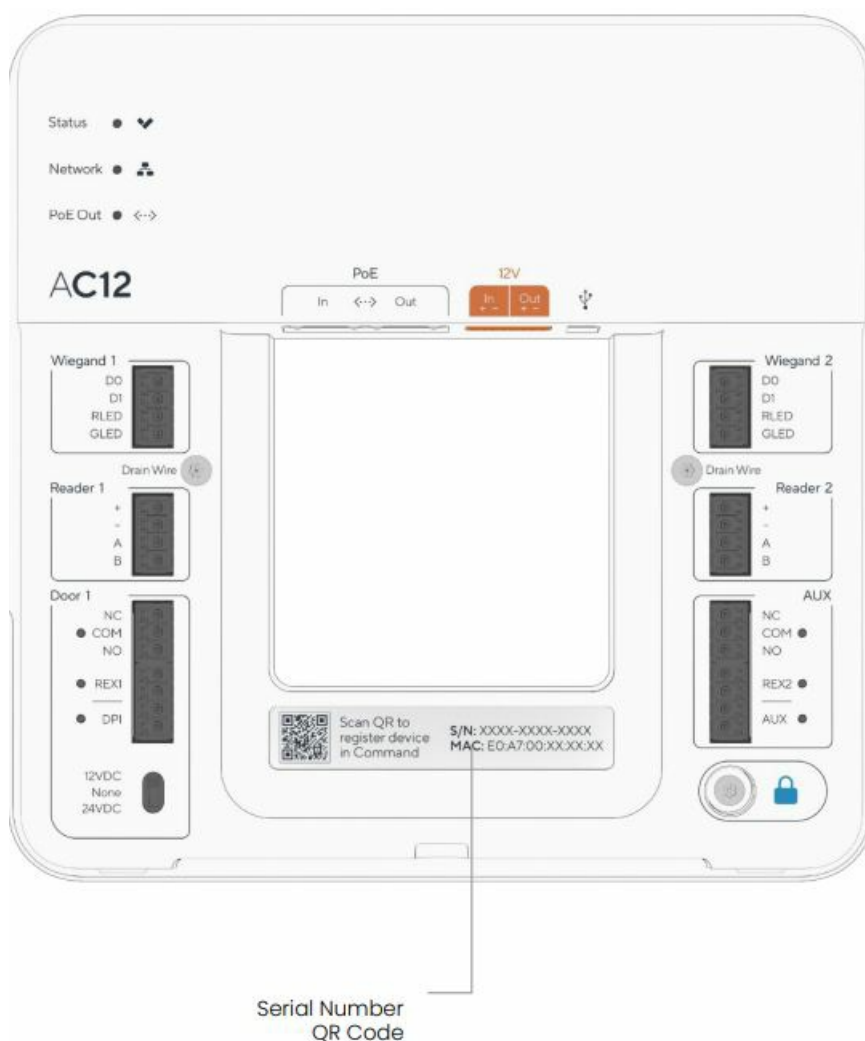
Required Network Settings

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 modeU

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**.

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 608 39-11-1	Environmental Level: Indoor Grade Assignment: Grade 1

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

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
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Reader Option 2 (20 AWG)	20	Yes		Yes	300 ft (91.4 m)
Reader Option 3 (18 AWG)	18	Yes		Yes	500 ft (152.4 m)
Power (22 Gauge)	22		Yes	Yes	600 ft (182.8 m)
Power (18 Gauge)	18		Yes	Yes	1500 ft (457.2 m)
Request-to-Exit	22/18		Yes	Yes	1500 ft (457.2 m)
Door Contact	22		Yes	Yes	1500 ft (457.2 m)

Shield Wiring and Grounding

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.

Required Network Settings

An Ethernet connection with 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-MAC address presence for single port in passthrough mode

LED Behavior

Status

- ● **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 for details.

- ☀ **Flashing Magenta**
  Unknown issue. Please
  contact our 24/7
  Technical Support Team.

Network

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**

  Camera is connected with PoE, but unable to connect to the switch.

- **1 Blue, 2 Orange**

  Camera has not received an IP address.

- **1 Blue, 3 Orange**

  Camera is unable reach the configured Gateway.

- **1 Blue, 4 Orange**

  Camera has detected duplicate IP addresses on the LAN.

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

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

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

1 Blue, 7 Orange
Camera is unable to certify the
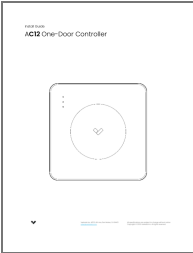SSL connection, likely due to SSL
inspection.

1 Blue, 8 Orange
Verkada endpoints are
unreachable after bootup.

PoE Out

- ● **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.

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Documents / Resources

	Verkada AC12 One Door Controller [pdf] Installation Guide AC12 One Door Controller, AC12, One Door Controller, Door Controller, Controller

References

- ❧ **Verkada**
- ❧ **Verkada**
- ❧ **Verkada**
- ❧ **Verkada Global Technical Support**
- **User Manual**

Manuals+,