Brivo ACS100
Installation Manual

Legal Disclaimers

Federal Communications Commission (FCC) Compliancy

You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

FCC 15B Class B

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio/TV technician for help.

This telecommunication equipment conforms to NTC technical requirement.

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'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Underwriter Laboratories (UL) Compliance

The ACS100 complies with the UL 294 Standard for access control units.

Canada-Underwriters Laboratories (C-UL) Compliancy (CSA C22.2 No. 205)

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

UL294/ULC Listing Compliancy

UL294 Peformance Levels					
Model Number	Access Control Line Security Level	Destructive Attack Level	Endurance Level	Stand-by Power Level	Conditions
Brivo ACS100-E (all three form factors)	Level 1	Level 1	Level 1	Level 1	N/A

Parts and Service

The ACS100 controller (part numbers listed below) contains no user serviceable parts.

ACS100 Part Numbers			
B-ACS100-E-BSPM-B	Mullion, Tri-Tech, Black	B-ACS100-E-BSPM-W	Mullion, Tri-Tech, White
B-ACS100-E-BSPS-B	Single-Gang, Tri-Tech, Black	B-ACS100-E-BSPS-W	Single-Gang, Tri-Tech, White
B-ACS100-E-BSPK-B	Keypad, Tri-Tech, Black	B-ACS100-E-BSPK-W	Keypad, Tri-Tech, White
B-ACS100-E-BSM-B	Mullion, Dual-Tech, Black	B-ACS100-E-BSM-W	Mullion, Dual-Tech, White
B-ACS100-E-BSS-B	Single-Gang, Dual-Tech, Black	B-ACS100-E-BSS-W	Single-Gang, Dual-Tech, White
B-ACS100-E-BSK-B	Keypad, Dual-Tech, Black	B-ACS100-E-BSK-W	Keypad, Dual-Tech, White

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Product Support

All support for this product is provided by the third-party dealer. Please contact the dealer who installed the product with questions and support requests.

Introduction

Document Objectives

This Installation Manual provides step-by-step instructions for installing the Brivo ACS100. Its primary audience is trained access control installation technicians (Installers) who are responsible for installing the ACS100 at client sites.

The manual is also intended for IT personnel, who should use it in conjunction with the Brivo Onair Administrator's Manual. It may be used by dealers and their sales professionals to help them conduct pre-sales, and to provide client support during the installation process. Finally, it may be used for in-house training purposes and ongoing support.

Document Layout

This manual is organized into a series of procedural checklists, detailing steps you must follow to ensure a safe and effective installation. The main sections of the manual are:

Pre-Installation Procedures
General Assembly Procedures
Configuration Procedures
Wiring Procedures

Terminology

The following is a list of terms that are used throughout this document. While some of these terms may have other meanings, the definitions provided below are the ones intended in this Installation Manual.

Control Panel: Brivo's one Door Controller (ACS100) is a native Ethernet and Bluetooth enabled access control panel and reader in a compact form factor. An additional reader can be added for in/out antipass-back configurations.

Reader: The ACS100 includes an integrated access control card reader. In addition, the reader has a Blue tooth/BLE radio which constitutes a wireless credential reader compatible with BT enabled smartphones. Access control system (ACS). The complete interaction between a control panel, Brivo Onair and the Brivo Onair cloud server.

Brivo Onair®: Brivo's cloud based software application which enables the end user to manage his or her Brivo Onair account.

Brivo Onair Cloud Server: The off-site servers, hosted by Brivo, that are used to store an account's database. Configuration and maintenance of the control panel is managed through Brivo Onair.

Wire Recommendations

Signal	Belden # or Equivalent	AWG	Twisted Pair	Shielded?	Max Length
Power	5504FE	22	Yes	Yes	600 ft
Power	6300FE	18	Yes	Yes	1500 ft
RJ45-Ethernet	N/A	Cat5	Yes	Yes	330 ft
Request-to-Exit	5520FE/6300FE	22/18	Yes	Yes	500 ft
Door Contact	5500FE	22	Yes	Yes	1500 ft
Earth Ground	N/A	6	Yes	Yes	20 to 40 ft
Optional OSDP Reader	N/A	24	Yes	Yes	1000 ft

Additional Resources

The following additional resources are available for the installer as well as the client.

- ACS100 Data Sheet
- Panel Networking Admin Interface Guide
- Approved Wiegand and OSDP Reader List
- Brivo Onair Account Quick Start Guide
- Technical Support: 1-866-BRIVO-4-U
- www.brivo.com

Pre-Installation Procedures

Before you begin installing the Brivo control panel, perform the following tasks to ensure a safe, speedy, and successful installation.

Understand the function of the Brivo ACS100-E control panel.

The ACS100-E is a one door control panel with a single access point. This control panel is considered a standalone system. The control board has one reader on-board. A second reader is supported for single door in/out antipassback configurations.

The Brivo ACS100-E uses an on-board Ethernet PoE interface to communicate via any TCP/IP networking technology that can be connected through a hub, router or switch, including satellite communications. It is an IP-enabled Access Control System that interacts with the Brivo Onair cloud server via the Internet application Brivo Onair.

Understand Brivo ACS100 product compatibility.

The ACS100 control panel allows for the attachment of one additional reader directly to the ACS100 control panel for the purposes of in/out scenarios (anti-passback). As such, the ACS100 is compatible with a large number of standard OSDP reader models including the following (UL tested for compatibility) reader models: OSDP reader 921PTPTEK00385. Brivo products are designed to accommodate the latest updates in OSDP using RS-485 reader formats. The ACS100 control board is compatible with OSDP readers using RS-485.

A current list of compatible readers and keypads is maintained on Brivo's website at http://www.brivo.com. If you have a specific model of reader or keypad that is not listed on the Brivo website, please contact Technical Support at 1-866-BRIVO-4-U to determine compatibility.

Verify that the client site is ready to support the installation.

1. Check with the IT department to ensure that the ACS100 to be installed is compatible with the company's local area network (LAN).

    a) The ACS100 is equipped with a standard RJ-45 socket that accepts a CAT5 cable with an RJ-45 plug on any 10/100 Ethernet network. Physically connecting the panel is the same as plugging any computer or other device into the LAN.

    b) Refer to connection instructions on Page 13 or in the Panel Networking Admin Interface Guide for instructions on connecting to the LAN. The Panel Networking Admin Interface Guide also contains a complete list of requirements regarding TCP/IP configuration parameters and information about security considerations.

2. Download the Brivo Onair Account Quick Start Guide from the Brivo website and provide it to the Master Administrator. This document provides instructions for registering and configuring the control panel in the application.

3. Make sure the account has been created and the control panel is registered through Brivo Onair. If the control panel has not been registered by the dealer, the installer may either contact Brivo Technical Support for assistance or simply register the panel directly.

4. Verify that the Master Administrator and any other employee who will be accessing the system have Internet access on a computer equipped with a supported Web browser.

Verify shipping contents.

1. Locate and check the contents of the Control Panel kit.

   The ACS100 kit should contain the following parts:

   a) 1 cardboard box containing the following:

   - The ACS100 unit, with its identification label on the back
   - An additional loose label for reference.
   - A quick start guide
   - A bag of accessory parts containing:
     - 1 MOV (Metal Oxide Varistor)
     - 2 120 ohm RS-485 bus termination resistors.
   - Back mounting metal plate and attachment screw
   - Pigtail cable with connections for door I/O and optional external reader

Plan your installation. Decide where to install the ACS100.

1. If not using Power Over Ethernet (PoE), do not place the ACS100 more than 100 feet from the transformer. This is the maximum cable run allowed by most external power supplies.

   a) Calculate the distance between the ACS100 and its associated keypad or reader. The ACS100 does not specify a maximum distance between the ACS100 and a keypad or reader, but the keypad/reader manufacturer does. Follow manufacturer guidelines for each keypad and reader.

   b) Place the ACS100 within 50 feet of its associated electronic strike or latch.

Follow safety precautions.

WARNING: Fire Code

Never connect A keypad/reader or lock to doors without first consulting the applicable fire code. You must consult with, and get approval from, local fire officials before installing locks or devices on any doors that may be fire exits. Use of egress push buttons may not be legal. Single action exits may be required. Always obtain proper permits and approvals in writing before installing equipment

WARNING: Fail Secure Mode

Do not install the system in the fail secure mode unless permitted by the local authority having jurisdiction. Doing so may cause interference with the operation of panic hardware.

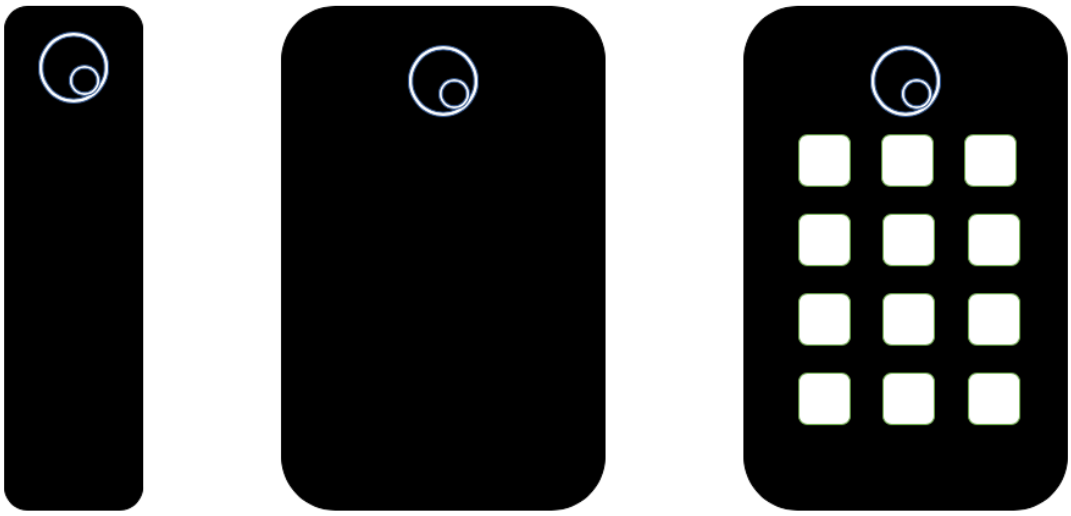
WARNING: Heat and Noise

Do not install the control panel in an area that could drop below 32 degrees FAHRENHEIT OR exceed 120 degrees. Doing so can cause damage to components within the control panel.

Do not install the control panel near or on the same circuit with devices that produce large amounts of electrical noise. This includes grinders, electric motors and blowers, electrical switch-gear and other electrically noisy equipment. Electrical noise can interfere with panel operation. If it is not possible to install the panel away from such sources of noise, it is advisable to isolate it by using a high-quality UPS (Uninterruptible Power Supply) between the AC Mains and the transformer.

- Unit is for indoor and outdoor use.
- Power wiring attached to the ACS100 unit should be 22 AWG or larger.
- Category 5 cabling is the minimum performance category recommended.
- Do not connect to a receptacle controlled by a switch.
- Compliance with IEEE 802.3 (at or af) specifications was not verified as part of UL294/B.
- If powered by 12VDC, the power supply must be a UL294 listed or UL 603 listed power supply. Battery capacity for loss of primary power at least zero (0) hours.

General Assembly Procedures



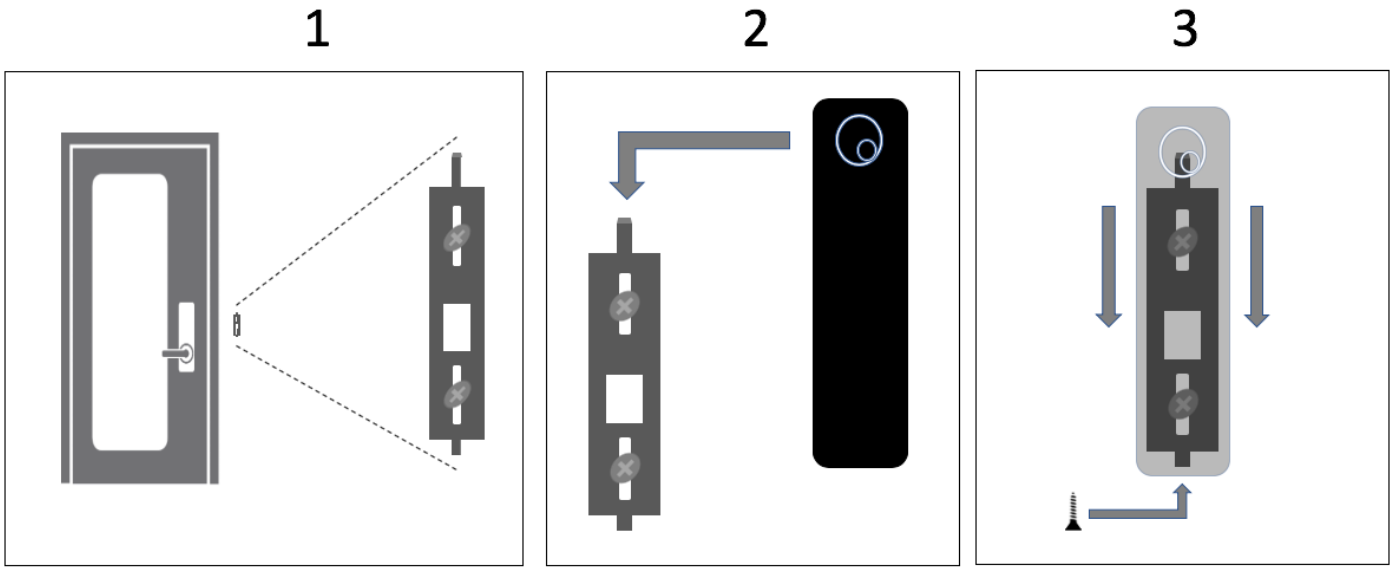
Mullion Full-Size Keypad

Assemble and mount ACS100.

1. Mount the ACS100 unit using one of the two methods described below.

   a) If using ACS100 mullion:

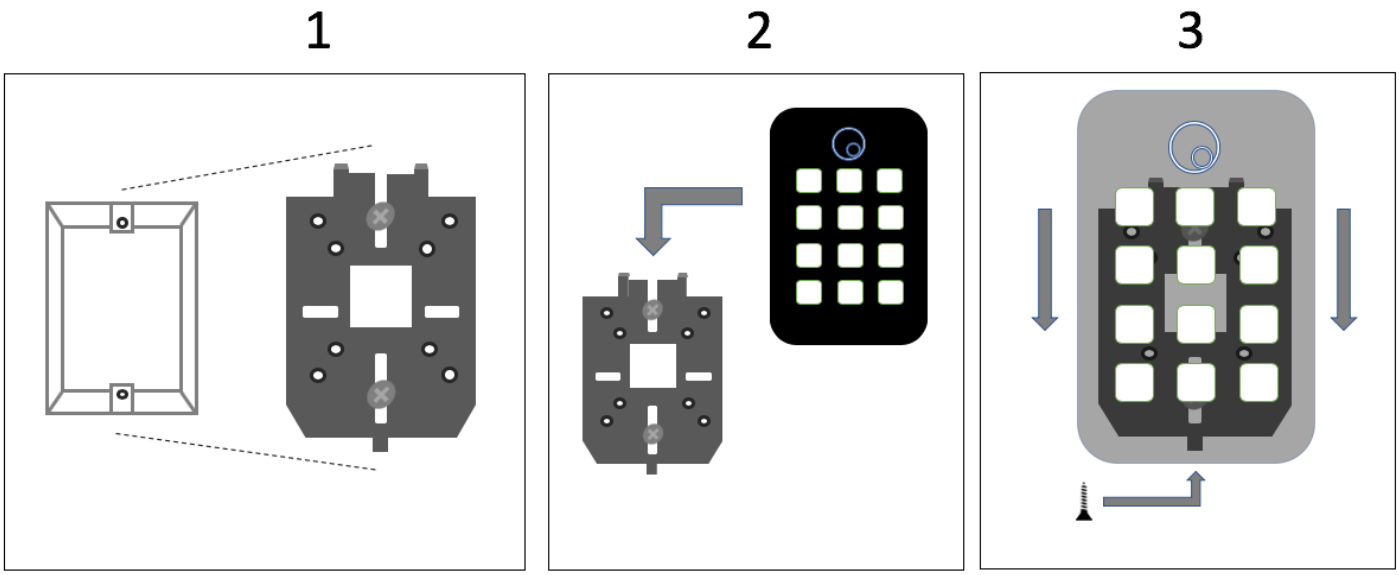
      i) Use two bolts on the back of the ACS100 unit to mount the ACS100 unit securely in place.



ACS100 Mullion Mounting

b. If using ACS100 full size or keypad:

i) Looking at the back of the ACS100 unit, use two bolts to mount the ACS100 unit to a junction box.

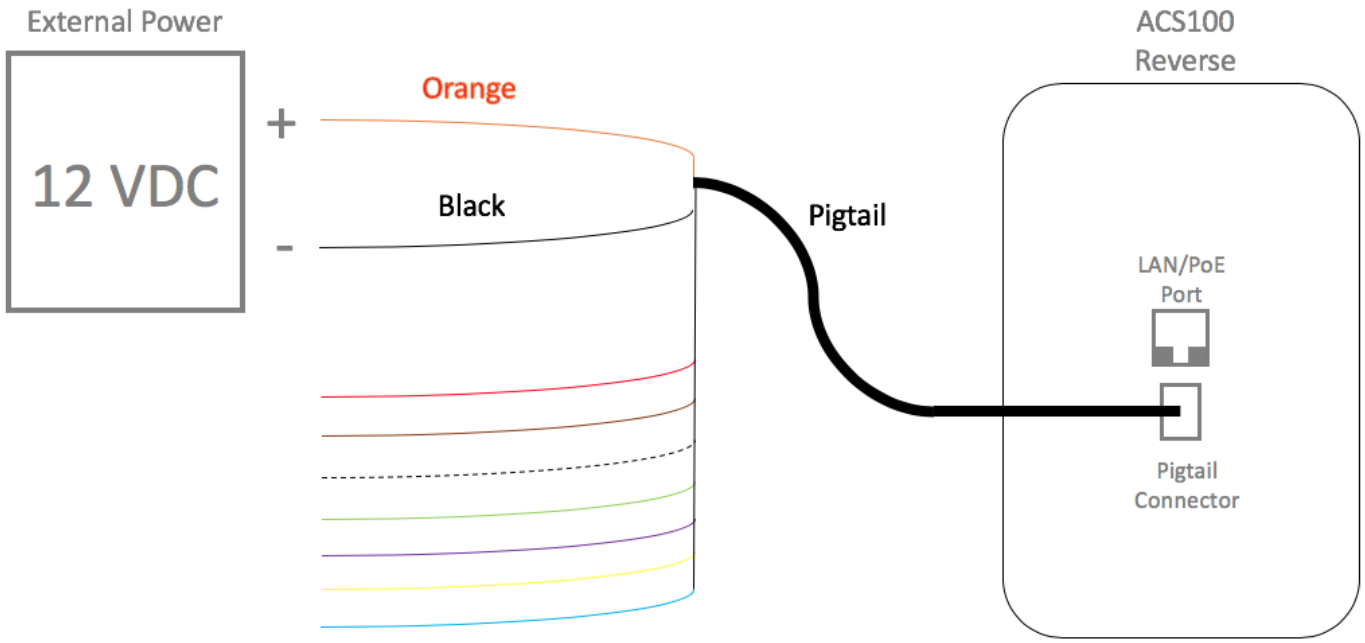


ACS100 Full Size or Keypad Mounting

c. If mounting the ACS100 unit on an exterior wall surface that will receive rain or moisture, run a bead of sealant around the back edge of the unit where it meets the walls.

OPTIONAL: If not using Power over Ethernet, wire the 12 V In (Orange) and Ground (Black) wires to an external 12 VDC Power Supply

1. Use 18 AWG wire (minimum grade) to connect the appropriate input power wires to the ACS100 unit.



Connecting optional External Power to the ACS100

Model	Circuit	Voltage (VDC)	Current (A)
Brivo ACS100-E	Input	12VDC	900mA

Wiring Procedures

Provided below is a Wire Block diagram for the ACS100 unit.

NOTE: The ACS100 has a pair of RS-485 wires for connecting an optional external OSDP Reader. The ACS100 can support one wired lock with up to two readers (one internal and one optional external).

For the ACS100 unit to be used for controlling a door, make the following connections:

ACS100 Pigtail Wiring Description

Red	12 V Out
Black	Ground
Brown	Switched/Ground / +12 V Trigger
Orange	12 V In
White	RS485B
Green	RS485A
Purple	AUX
Yellow	DC
Blue	REX

ACS100 Wire Block

Wire the REX & DOOR CONTACT (DC)

1. Connect the Normally Open (NO) contacts of the REX device to the REX (Blue) and Ground (Black) wires.

    a) When this switch closes, it initiates a Request-to-Exit (REX) program sequence, as defined by the appropriate application, including the option to activate the door or other relays, fire the door strike, and suppress any “Door Forced” messages.

2. Connect the Normally Closed (NC) contacts of the Door Contact (DC) to the DC (Yellow) and Ground (Black) wires.

    a) In this context, an NC switch is considered closed when the door is closed (magnet is present), and open when the door is open (no magnet is present).

b) When the switch is open, the control panel interprets this input as a "Door Open" condition. When the switch is closed, the control panel interprets this input as a "Door Closed" condition.

c) This circuit provides door status information (open/closed) to the control panel so the Brivo Onair Cloud Server can take appropriate action locally, or send email notifications if necessary.

Wire the DOOR LOCK RELAY

1. Using the output 12VDC and the Switched Ground, Door Strikes and Magnetic Locks can be directly powered. In the use case of a Door Strike, the strike is connected to the ACS100's 12 VDC and the Switched Ground. The Switched Ground can be configured as Normally Open (Normal) or Normally Closed (Energized) depending on the lock utilized. In this scenario, the ACS100 can switch up to 3A@12VDC.

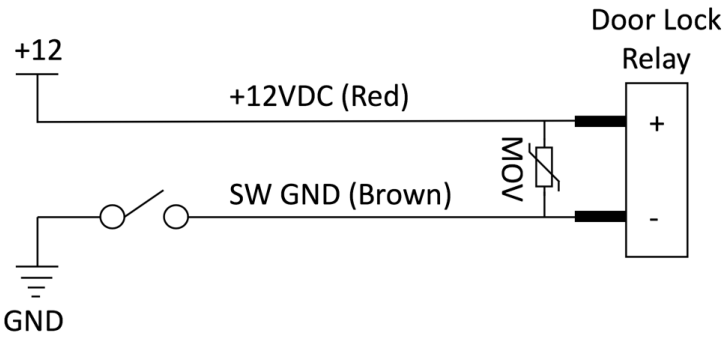
2. For situations requiring a 24 VDC lock, an external power source can be used to power the lock, use a shared ground between the power source and the ACS100, and then use the Switched Ground to power the lock or solenoid. In this scenario, the ACS100 can drive up to 3A@24VDC (note that the ACS100 should be powered from PoE or 12 VDC power supply).

3. Devices which require a switched ground to externally drive an external device (such as a PIR sensor turning on and off a mag lock) can use the Switched Ground directly. It can pull 650mA via the 12V output up to 104 degrees Fahrenheit (40 degrees C).

4. Devices which require a switched 12V trigger (low power signalling) to turn on and off the lock can configure the ACS100 to use the 12V trigger. Note that in this scenario, the Brown wire is pulled high to 12V to use as a trigger, but won't be able to source power.

5. From the Brivo Onair user interface, the ACS100 door lock relay default state can be configured in software as Normal or Energized. In addition to the default state selection, an installer is also able to select the Output Mode with the options of Lock Power or Lock Trigger.

    - Lock Power refers to the Switched Ground connection which may be used to energize or de-energize locks.
    - Lock Trigger refers to the 12VDC Trigger which shares a common connection with the Switched Ground. It may be used as a low power input signal to an external power control device.



Lock Power Wiring Diagram

6. Connect the ACS100 12 V Out (Red) to the positive side of the Door Lock Relay.

7. Connect the ACS100 Switched Ground (Brown) to the negative side of the Door Lock Relay.

Wire the AUXILIARY INPUT (AUX)

1. There are three (3) Supervised Inputs: Request To Exit (REX), Door Contact (DC), and Auxiliary Input (AUX). The Inputs can be configured as:

   - Two (2) State (non-supervised) with Closed / Open Status.

   - Four (4) State (use of two 2Kohm End of Line Resistors) supervised with Closed / Open / Short / Cut Status.

2. If used, wire the Aux Input using the Purple (AUX) wire and the Ground (Black) wire. The Aux Input can be used for a variety of purposes, and is programmed through the Brivo programming interface.

WARNING: Noise Suppression

1. Install the MOV across the conductors, as close as possible to the electric strike, latch, or magnetic lock. This will normally be at the connection from the field-installed wiring to the pigtail or screw terminals of the electronic strike, latch, or magnetic lock.

2. Use the wire recommended by the manufacturer of the electric strike or latch. If no wire is recommended, use a minimum of 18 AWG wire with sufficient strands for the specific electronic strike or latch.

Wire the optional SECOND READER

1. If you are using an optional external OSDP reader, connect the wire properly to the pigtail. Following is a typical, but not universal, wiring guide. Refer to the Approved Wiegand and OSDP Reader List for guidelines related to your specific reader or keypad.

   a) Connect the wire to the RS485A (Green) wire. This is the standard RS485A circuit for OSDP readers using RS-485.

   b) Connect the wire to the RS485B (White) wire. This is the standard RS485B circuit for OSDP readers using RS-485.

   c) Connect the wire to the Ground (Black) wire. This is the standard Ground circuit for the reader.

   d) Connect the wire to the 12V Out (Red) wire. This provides +12VDC to power the reader.

NOTE: The ACS100 unit only supports RS485 Half-Duplex mode of operation.

IMPORTANT RS-485 WIRING INFORMATION

NOTE: If the external OSDP reader is a significant distance from the ACS100 unit, then it is recommended that both ends of the RS-485 bus are terminated using a 120 ohm resistor.

NOTE: When wiring the RS-485 bus, use only twisted pair shielded wire.

NOTE: Refer to the Approved Wiegand and OSDP Reader List for Brivo approved OSDP devices.

Ground the ACS100

1. When grounding the ACS100 unit, use 18 AWG or larger wire to connect the ACS100 to a suitable earth ground.

Power up the ACS100

NOTE: The ACS100 is UL listed when using DC power.

1. Ensure that all wiring is complete prior to powering up the ACS100 unit.
2. Plug the CAT 5 cable into the LAN/PoE connector.
3. If not using PoE, plug in power to the ACS100 unit using 12 V In (Orange) and Ground (Black).
4. Confirm after a few seconds that the Brivo logo light is on.
5. If after verifying that the unit is powered and the Brivo logo does not illuminate, contact Technical Support.
6. Optionally, you may use PoE and an external 12V power supply for redundant simultaneous power input.

Configuration Procedures

If any manual configuration is required, connect a laptop to the same local area network as the ACS100 unit.

NOTE: The laptop and ACS100 unit **MUST** be on the same subnet.

1. Set your NIC interface on your laptop/PC to IP **169.254.242.122** and net mask **255.255.255.0** .
2. Connect the CAT5 cable from the NIC interface on the laptop to PoE network switch.
3. Connect another CAT5 cable from PoE network switch to ACS100 unit. Allow a few seconds for the ACS100 unit to boot up.
4. Open a web browser and navigate to **169.254.242.121** .
5. When the prompt appears for username/password, use username **cli** and password **new5cli**.
    a) The Administrative Interface (WebCLI) is used to gain access to the onboard functionality for debugging and manual configuration utilities.

Verify connection of the LAN to the ACS100

1. Using CAT5 cable, connect the LAN to the ACS100 unit via its LAN port.
    a) The LAN port is a 10/100 Ethernet interface with an RJ45 jack for connecting the Ethernet port on the back of the ACS100 to a Local Area Network in order for it to gain connectivity to the Internet.
    b) Use a straight, (i.e., non-crossover) cable to connect this port to a local hub, switch or router.
2. Verify the connection of the LAN to the ACS100 by accessing the Administrative Interface (WebCLI) using the instructions listed in the previous step. On the main page of the Administrative Interface, you should see a recent time/date stamp in the Last Contact with Central field.

NOTE: Firmware Upgrade - When first registered and connected to the Brivo Onair cloud service, your ACS100 will automatically download and install the latest firmware. This process may take several minutes, so do not disconnect or cut power to your ACS100 during this process. If you encounter any difficulties during this process, please contact Brivo Technical Support at 866-274-8648 or email customercare@brivo.com.

Revision Table

Version	Date	Content
1.0	01/22/2020	Original document
1.1	01/23/2020	Updated with requested changes by Wavelynx
1.2	03/12/2020	Added note for UL
1.3	04/17/2020	Added part numbers on Page 3, updated Wiring Procedures, compliance language, and firmware upgrade language