



LP1501

PoE Door Controller

Installation Guide

ADC-AC-LP1501

Only compatible
with Mercury Series
expansion modules



The LP1501 PoE Door Controller provides local decision making, event reporting, and database storage capabilities for the Alarm.com Smarter Access Control platform. Two reader interfaces provide control for one supervised physical barrier or two unsupervised physical barriers.



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For UL compliance, the Power Sourcing Equipment, such as a PoE enabled network switch and/or PoE power injectors, must be UL Listed under UL294B.

LP1501 PoE Door Controller

Reader port 1 can accommodate a Wiegand reader and provides LED and buzzer control. This port can alternatively utilize a two-wire RS-485 bus to connect up to eight Mercury series expansion modules. Reader port 2 can accommodate a Wiegand reader and provides LED and buzzer control.

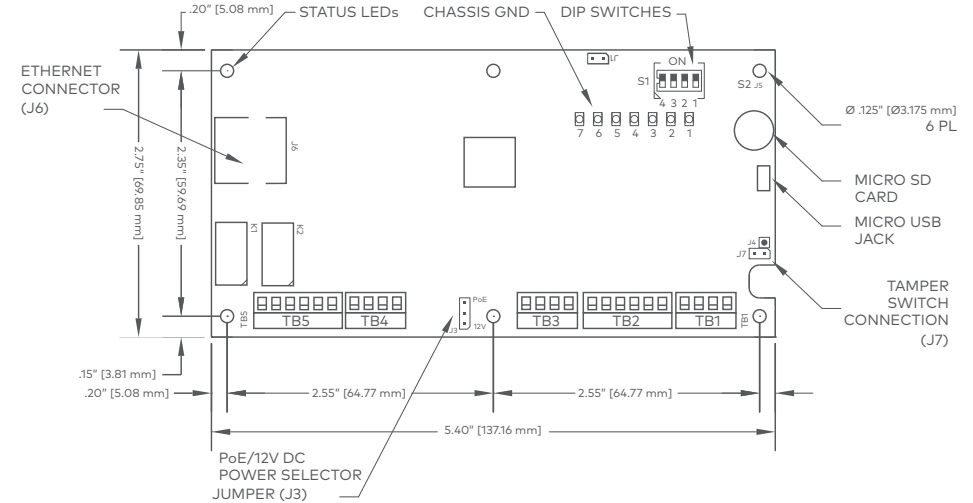
Two Form-C contact relay outputs may be used to control locking hardware. The relay contacts are rated at 2 A @ 30 VDC, dry contact configuration. The two inputs that are provided may be used for monitoring door position switches or request-to-exit devices. Input circuits can be configured as unsupervised or supervised. The LP1501 requires Power over Ethernet (PoE), PoE+ or 12 VDC for power.

The LP1501 may be mounted in a 3-gang switch box, on the provided mounting plate, or in an enclosure. The mounting plate included in the Power Supply Kit has mounting holes that match the ADC-ACX1 (ADC-AC-MR50) mounting footprint.

The SRAM is backed up by a rechargeable battery when input power is removed. This battery should retain the data for a minimum of 3 days. If data in the SRAM is determined to be corrupt after power up, all data, including flash memory, is considered invalid and is erased. All configuration and cardholder data must be re-downloaded.

The initial charge of the battery may take up to 48 hours to be fully charged.

LP1501 hardware



Wiring and DIP switch setup

Connections

TB1-1	IN1	Input 1
TB1-2		
TB1-3	IN2	Input 2
TB1-4		
TB2-1	VO	Reader 1 Power Output - 12 VDC
TB2-2	LED	Reader 1 LED Output
TB2-3	BZR	Reader 1 Buzzer Output
TB2-4	CLK	Reader 1 CLK/Data 1/TR+
TB2-5	DAT	Reader 1 DAT/Data 0/TR-
TB2-6	GND	Reader 1 Ground
TB3-1	LED	Reader 2 LED Output
TB3-2	BZR	Reader 2 Buzzer Output
TB3-3	CLK	Reader 2 CLK/Data 1 Input

TB3-4	DAT	Reader 2 DAT/Data 0 Input
TB4-1	VO	Auxiliary Power Output – 12 VDC
TB4-2	GND	Auxiliary Power Output Ground
TB4-3	VIN	Input Power – 12 VDC (from local power supply)
TB4-4	GND	Input Power Ground
TB5-1	NO	Relay K1 – Normally Open Contact
TB5-2	1-C	Relay K1 – Common Contact
TB5-3	NC	Relay K1 – Normally Closed Contact
TB5-4	NO	Relay K2 – Normally Open Contact
TB5-5	2-C	Relay K2 – Common Contact
TB5-6	NC	Relay K2 – Normally Closed Contact

Jumpers

Jumpers	Set At	Description
J3	PoE	LP1501 powered from the Ethernet connection
	12 V	LP1501 powered from a local 12 VDC power source connected to TB4-3 (VIN), TB4-4 (GND)
J7		Cabinet Tamper Switch Input. Enclosure tamper disabled by default. Add jumper to connect pins and secure cabinet (enable tamper)

DIP switches

The four DIP switches determine the operating mode of the LP1501 processor. DIP switches are read on power-up except where noted.

Normal operation mode (all DIP switches in off position)

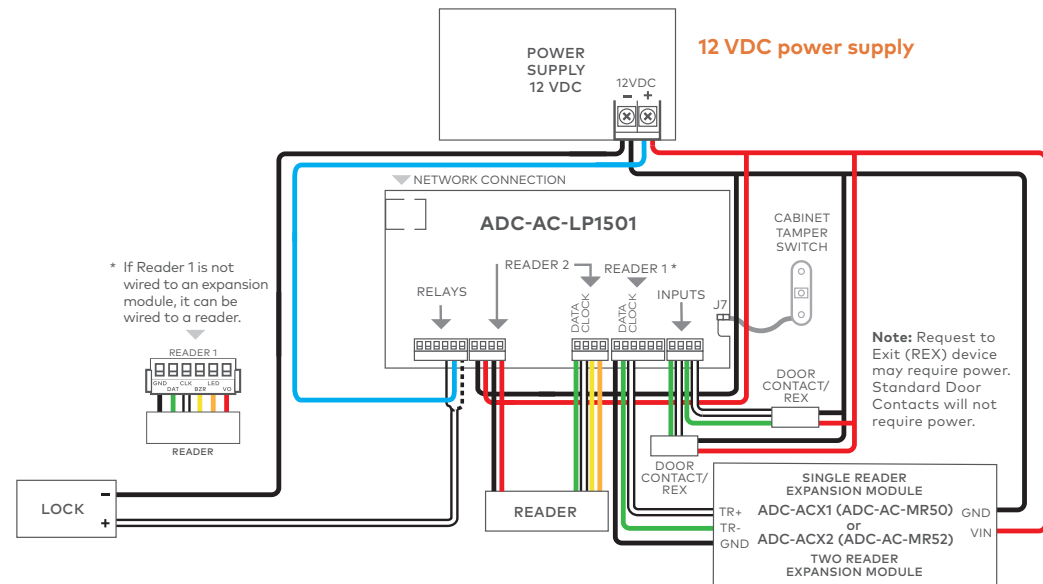
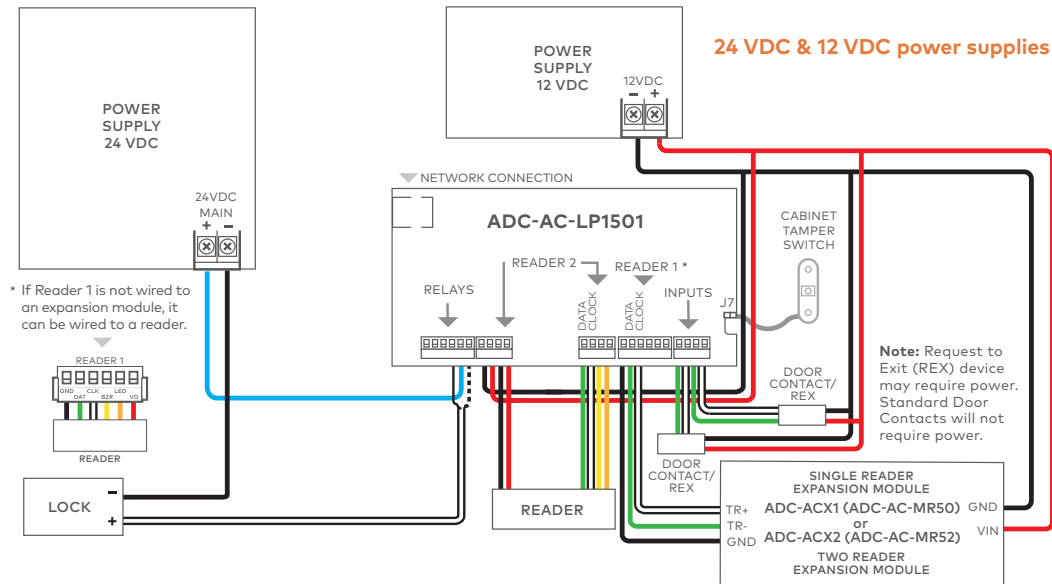


Note: Controllers are shipped with all DIP switches in the ON position. Before powering the controller on, set all DIP switches to the OFF position to use the Normal Operating Mode.

For information about advanced configurations, please visit the Knowledge Base:



Use MobileTech (tap ? > **Scan QR Code**) to view the Advanced DIP Switch configurations.



Status LEDs



Power-up: All LEDs off

Initialization: LEDs 1, 2, 3, 4, 5, 6, and 7 are sequenced during initialization. LEDs 1, 3, and 4 are turned ON for approximately 1.5 seconds after the hardware initialization has completed, then the application code is initialized. The amount of time the application takes to initialize depends on the size of the database. When LEDs 1, 2, 3 and 4 flash at the same time, data is being read from or written to flash memory, do not cycle power when in this state.

If the sequence stops or repeats, perform the Factory Reset procedure.

If clearing the memory does not correct the initialization problem, contact technical support.

Running

LED	Description
1	Connecting to Alarm.com =  20% on, 80% off
	Connected to Alarm.com =  80% on, 20% off
2	Alarm.com Communication Activity
3	Readers/Expansions: Flashes when Transmitting Data
4	Input IN1 Status: OFF = Inactive, ON = Active, Flash = Trouble*
5	Input IN2 Status: OFF = Inactive, ON = Active, Flash = Trouble*
6	Cabinet Tamper - Configured with J7 jumper
7	Reserved

*If this input is defined, every three seconds the LED is pulsed to its opposite state for 0.1 seconds, otherwise, the LED is off.

Factory reset

The Factory Reset function can be used for the following purposes:

- Erase all configuration and cardholder database information
- Recover from database corruption causing LP1501 board to continuously reboot
- Erase any previously configured static IP settings

If clearing the memory does not correct the initialization problem, contact technical support.

Factory reset steps

- 1 With the LP1501 board powered off, set S1 dip switches to: 1 & 2 "ON", 3 & 4 "OFF".
- 2 Apply power to the LP1501 board. LED 1 will turn on for about 15 seconds while the LP1501 boots up.

Do not remove power during the following steps.

- 3 Watch for LEDs 1 & 2 and 3 & 4 to alternately flash at a 0.5 second rate; LED 1 will be solid for 15 seconds before this occurs.
- 4 Within 10 seconds of powering up, change switches 1 and 2 to "OFF".
- 5 Full memory erase takes up to 60 seconds.
- 6 When complete, only LEDs 1 & 4 will flash for 8 seconds.
- 7 The LP1501 board will reboot 8 seconds after LEDs 1 & 4 stop flashing (no LEDs are on during this time)

Input power

The LP1501 may be powered in one of two ways. Use jumper J3 to select the input power source:

- Power over Ethernet (PoE or PoE+) connection, fully compliant to IEEE 802.3af, or
- Local 12 VDC power supply wired to TB4-3 (VIN), TB4-4 (GND)

Reader & expansion module wiring

Reader port 1

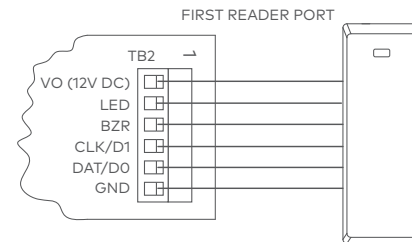
- This port can be used to wire either one Wiegand reader or up to eight Mercury Series expansion modules using a 2-wire RS-485 bus. The maximum cable length is 2,000 ft. (610 m).
- Power is supplied to reader port 1 at 12 VDC at 300 mA maximum.

Reader port 2

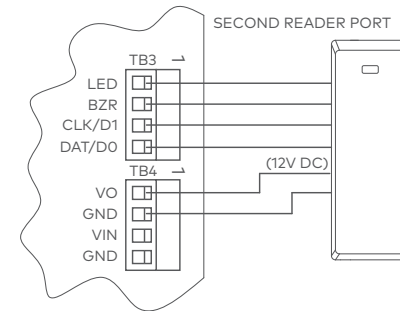
- This port can be used to wire one Wiegand reader.
- The reader connected to reader port 2 may be powered from the 12 VDC auxiliary power output (TB4-1 and TB4-2).
- Readers that require different voltage or have high current requirements should be powered separately.
- Refer to the reader manufacturer specifications for cabling requirements.
- For readers with two LED wires, only connect the wire controlling the green LED to the LP1501.
- When powering expansion modules and peripherals from the LP1501, be cautious not to exceed 625 mA @ 12 VDC when using PoE, or 1.25 A when using PoE+ or a 12 VDC power supply. 22 AWG minimum recommended for readers.

Reader wiring diagrams

Reader Port 1: Typical Wiegand Reader



Reader Port 2: Typical Wiegand Reader

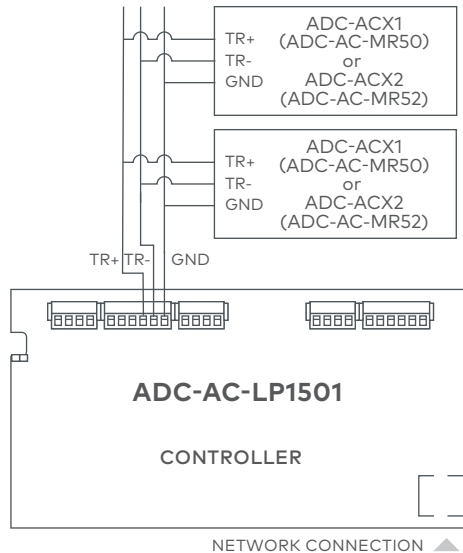


Reader Port 1: Wiring expansion modules using 2-wire RS-485

Up to eight total expansion modules may be wired. The last expansion module on the bus must have jumper J5 installed for ADC-ACX2 (ADC-AC-MR52) modules and J4 installed for ADC-ACX1 (ADC-AC-MR50) modules.

Use twisted pair 24 AWG, 120 ohm impedance cable with drain and shield wires. 2,000 ft. (609 m) maximum total length.

Note: For ease of install, daisy chain expansion modules together. Wire each expansion module to the next module instead of wiring directly back to the controller.



Relay wiring

Two Form-C contact relays are provided for controlling door lock mechanisms. The relay contacts are rated at 2 A @ 30 VDC, dry contact configuration. Each relay has a Common pole (C), a Normally Open pole (NO), and a Normally Closed pole (NC).

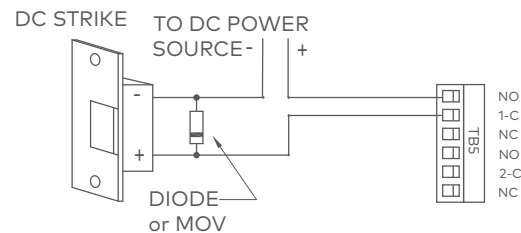
When momentarily delivering power to unlock the locking hardware (fail secure), the Normally Open and Common poles are used. When momentarily removing power to unlock the locking hardware (fail safe), the Normally Closed and Common poles are used. Check with local building codes for proper egress door installation. Door lock mechanisms can generate EMF feedback to the relay circuit that can cause damage and premature failure of the relay. For this reason, it is recommended that either a diode or MOV (metal oxide varistor) be used to protect the relay.

From the Auxiliary output, the LP1501 can provide 12 VDC power for external devices, provided the maximum output is not exceeded. See the specifications section for details. If a local power supply is used, it must be UL Listed Class 2 rated. 18 AWG minimum recommended for electric locking hardware.

Relay circuit wiring diagrams

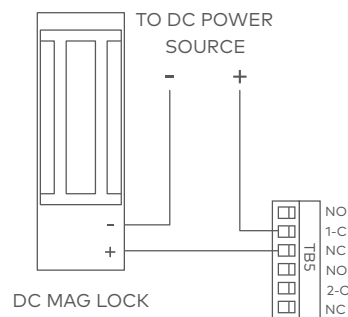
Diode selection:

- Diode current rating: 1x strike current
- Diode breakdown voltage: 4x strike voltage



MOV selection:

- Clamp voltage: 1.5x VAC RMS
- Use UL recognized MOV with appropriate ratings



Input wiring

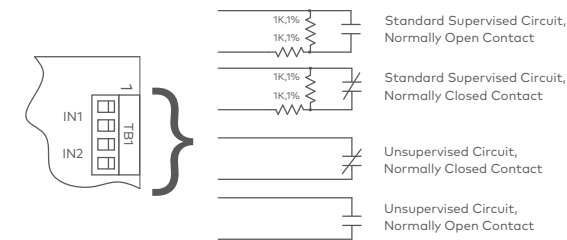
Inputs are used to monitor door position switches or request-to-exit devices. Input circuits can be configured as unsupervised or supervised. When unsupervised, reporting consists of only the open or closed states.

When configured as supervised, the input circuit will report not only open and closed but also open circuit, shorted, grounded,* and foreign voltage.* A supervised input circuit requires two resistors be added to the circuit to facilitate proper reporting. The standard supervised circuit requires 1k ohm, 1% resistors, which should be located as close to the sensor as possible.

* Grounded and foreign voltage states are not a requirement of UL 294 and therefore not verified by UL.

22 AWG minimum required for input wiring. 18 AWG recommended if wiring request-to-exit devices in series with locking hardware.

The input circuit wiring configurations shown are supported but may not be typical:



Specifications

The interface is for use in low voltage, Class 2 circuits only.

The installation of this device must comply with all local fire and electrical codes.

Input power

PoE/PoE+ or 12 VDC, 1.8 A max

Output power

PoE: 12 VDC @ 625 mA

PoE+ or External 12 VDC Power Supply: 12 VDC @ 1.25 A

Inputs

One dedicated reader input

One switchable reader/two-wire RS-485 input

Two programmable inputs

One dedicated tamper input

Outputs

Two relay outputs (2 A @ 30 VDC)

Single-wire LED control

Single-wire buzzer output

Certifications

HSPD-12/FIPS201 compliant

UL 294 and UL 294B recognized

RoHS

FCC Part 15 Class A

NIST certified encryption

Dimensions (W x L x H)

Without Bracket: 5.5 x 2.75 x 0.96" (140 x 70 x 24 mm)

With Bracket: 5.5 x 3.63 x 1.33" (140 x 92 x 34 mm)

Temperature

32°F – 158°F (0°C – 70°C) operational

-67°F – 185°F (-55°C – 85°C) storage

Operating humidity

5% - 95% (non-condensing) RH

Questions



Visit: www.alarm.com/supportcenter
or Use MobileTech (tap ? > **Scan QR Code**)
to view our Access Control Knowledge Base.

Warranty

Mercury Security warrants the product is free from defects in material and workmanship under normal use and service with proper maintenance for one year from the date of factory shipment. Mercury Security assumes no responsibility for products damaged by improper handling or installation. This warranty is limited to the repair or replacement of the defective unit.

There are no expressed warranties other than set forth herein. Mercury Security does not make, nor intends, nor does it authorize any agent or representative to make any other warranties, or implied warranties, and expressly excludes and disclaims all implied warranties of merchantability or fitness for a particular purpose.

Returns must be accompanied by a Return Material Authorization (RMA) number obtained from customer service, and prepaid postage and insurance.

Liability

The Interface should only be used to control exits from areas where an alternative method for exit is available. This product is not intended for, nor is rated for operation in life-critical control applications. Mercury Security is not liable under any circumstances for loss or damage caused by or partially caused by the misapplication or malfunction of the product. Mercury Security's liability does not extend beyond the purchase price of the product.



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.



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Developed with
the Authentic Mercury
open hardware platform



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