



# MR52 TWO READER EXPANSION MODULE

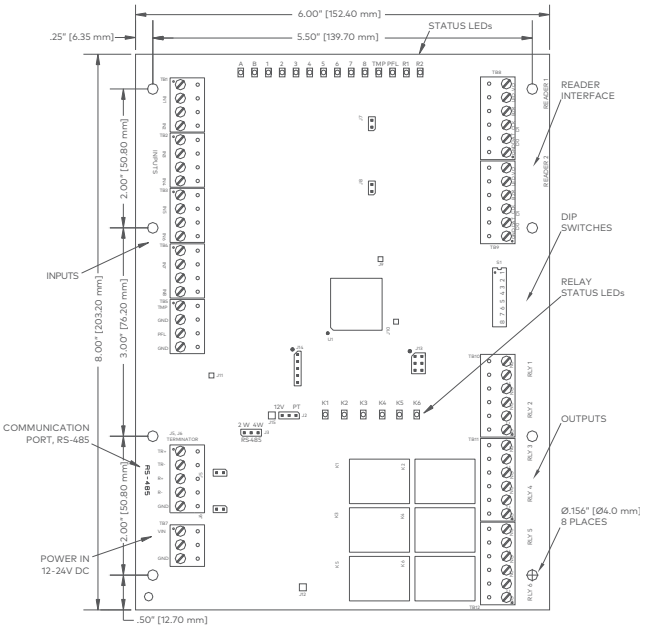
INSTALLATION GUIDE  
**ADC-AC-MR52**

SMARTER  
ACCESS  
CONTROL



# MR52 TWO READER EXPANSION MODULE

The ADC-AC-MR52 expansion module provides a solution for controlling two additional Wiegand readers and door hardware. The ADC-AC-MR52 provides LED control and buzzer control. Six Form-C relay outputs may be used to control locking hardware. Eight inputs are provided that may be used for monitoring the door contact or request-to-exit devices. Input circuits can be configured as unsupervised or supervised using end of line resistors. Communication to the Alarm.com Door Controller is accomplished using a 2-wire RS-485 interface. The ADC-AC-MR52 requires 12 to 24V DC for power. See the following figure for component location.



# Wiring

## CONNECTIONS

|              |       |                                     |
|--------------|-------|-------------------------------------|
| <b>TB1-1</b> | IN1   | Input 1                             |
| <b>TB1-2</b> |       |                                     |
| <b>TB1-3</b> | IN2   | Input 2                             |
| <b>TB1-4</b> |       |                                     |
| <b>TB2-1</b> | IN3   | Input 3                             |
| <b>TB2-2</b> |       |                                     |
| <b>TB2-3</b> | IN4   | Input 4                             |
| <b>TB2-4</b> |       |                                     |
| <b>TB3-1</b> | IN5   | Input 5                             |
| <b>TB3-2</b> |       |                                     |
| <b>TB3-3</b> | IN6   | Input 6                             |
| <b>TB3-4</b> |       |                                     |
| <b>TB4-1</b> | IN7   | Input 7                             |
| <b>TB4-2</b> |       |                                     |
| <b>TB4-3</b> | IN8   | Input 8                             |
| <b>TB4-4</b> |       |                                     |
| <b>TB5-1</b> | TMP   | Tamper Input: short = tamper secure |
| <b>TB5-2</b> | GND   |                                     |
| <b>TB5-3</b> | PFL   | Power Failure Monitor               |
| <b>TB5-4</b> | GND   |                                     |
| <b>TB6-1</b> | TR+   | 2-Wire RS-485 Bus                   |
| <b>TB6-2</b> | TR-   |                                     |
| <b>TB6-3</b> | R+    | 4-Wire RS-485 Bus (Not Used)        |
| <b>TB6-4</b> | R-    |                                     |
| <b>TB6-5</b> | GND   | Communication Bus Ground            |
| <b>TB7-1</b> | VIN   | Input Power                         |
| <b>TB7-2</b> | Blank | Not Used                            |
| <b>TB7-3</b> | GND   | Ground                              |
| <b>TB8-1</b> | VO    | Reader 1 Power Output               |
| <b>TB8-2</b> | LED   | Reader 1 LED Output                 |

|               |               |                                   |
|---------------|---------------|-----------------------------------|
| <b>TB8-3</b>  | <b>BZR</b>    | Reader 1 Buzzer Output            |
| <b>TB8-4</b>  | <b>CLK/D1</b> | Reader 1 CLK/D1                   |
| <b>TB8-5</b>  | <b>DAT/DO</b> | Reader 1 CLK/DO                   |
| <b>TB8-6</b>  | <b>GND</b>    | Reader 1 Ground                   |
| <b>TB9-1</b>  | <b>VO</b>     | Reader 2 Power Output             |
| <b>TB9-2</b>  | <b>LED</b>    | Reader 2 LED Output               |
| <b>TB9-3</b>  | <b>BZR</b>    | Reader 2 Buzzer Output            |
| <b>TB9-4</b>  | <b>CLK/D1</b> | Reader 2 CLK/D1                   |
| <b>TB9-5</b>  | <b>DAT/DO</b> | Reader 2 CLK/DO                   |
| <b>TB9-6</b>  | <b>GND</b>    | Reader 2 Ground                   |
| <b>TB10-1</b> | <b>NC</b>     | Relay 1 - Normally Closed Contact |
| <b>TB10-2</b> | <b>C</b>      | Relay 1 - Common Contact          |
| <b>TB10-3</b> | <b>NO</b>     | Relay 1 - Normally Open Contact   |
| <b>TB10-4</b> | <b>NC</b>     | Relay 2 - Normally Closed Contact |
| <b>TB10-5</b> | <b>C</b>      | Relay 2 - Common Contact          |
| <b>TB10-6</b> | <b>NO</b>     | Relay 2 - Normally Open Contact   |
| <b>TB11-1</b> | <b>NC</b>     | Relay 3 - Normally Closed Contact |
| <b>TB11-2</b> | <b>C</b>      | Relay 3 - Common Contact          |
| <b>TB11-3</b> | <b>NO</b>     | Relay 3 - Normally Open Contact   |
| <b>TB11-4</b> | <b>NC</b>     | Relay 4 - Normally Closed Contact |
| <b>TB11-5</b> | <b>C</b>      | Relay 4 - Common Contact          |
| <b>TB11-6</b> | <b>NO</b>     | Relay 4 - Normally Open Contact   |
| <b>TB12-1</b> | <b>NC</b>     | Relay 5 - Normally Closed Contact |
| <b>TB12-2</b> | <b>C</b>      | Relay 5 - Common Contact          |
| <b>TB12-3</b> | <b>NO</b>     | Relay 5 - Normally Open Contact   |
| <b>TB12-4</b> | <b>NC</b>     | Relay 6 - Normally Closed Contact |
| <b>TB12-5</b> | <b>C</b>      | Relay 6 - Common Contact          |
| <b>TB12-6</b> | <b>NO</b>     | Relay 6 - Normally Open Contact   |

## JUMPERS

| Jumper   | Description  |
|----------|--|
| J2       | <b>Reader Power Select</b><br>12V = 12V DC at reader ports<br>Requires ≥ 20V DC supplied to VIN<br>PT = VIN "Passed Through" to reader ports |
| J3       | 2-Wire/4-Wire Select, install in 2W position only  |
| J5       | RS-485 Termination, install in last units only   |
| J6 - J15 | Factory Use Only   |

## Status LEDs

**Power-up:** All LEDs OFF

**Initialization:** Once power is applied, initialization of the module begins

When initialization is completed, LEDs A through R2 are briefly sequenced ON then OFF

**Run time:** After a successful initialization, the LEDs have the following meanings:

**A LED:** Heartbeat and On-Line Status:

**Off-line:** 1 second rate, 20% ON 

**On-line:** 1 second rate, 80% ON 

**A LED Error Indication:**

**Waiting for application firmware to be downloaded:**  
0.1 s ON, 0.1 s OFF

**B LED:**

**Communication Port Status:** Indicates communication activity on the communication port

**1 - 8 LEDs:** Input Status for IN1 - IN8

**TMP:** Cabinet Tamper

**PFL:** Power Fault

Input in the inactive state: OFF  
(briefly flashes ON every 3 seconds)



Input in the active state: ON  
(briefly flashes OFF every 3 seconds)



Input in a trouble state: Rapid Flash



**R1 LED:** Reader port 1: Flashes when data is received, either input

**R2 LED:** Reader port 2: Flashes when data is received, either input

**K1 through K6 LEDs:** Illuminates when output relay RLY 1 (K1) through RLY 6 (K6) is energized

Every three seconds, LEDs **A** through **R2** are pulsed to their opposite state for 0.1 s

The ADC-AC-MR52 accepts 12 to 24V DC for power on TB7. Locate the power source as close to the ADC-AC-MR52 as possible. Make power connection with minimum of 18 AWG wires.

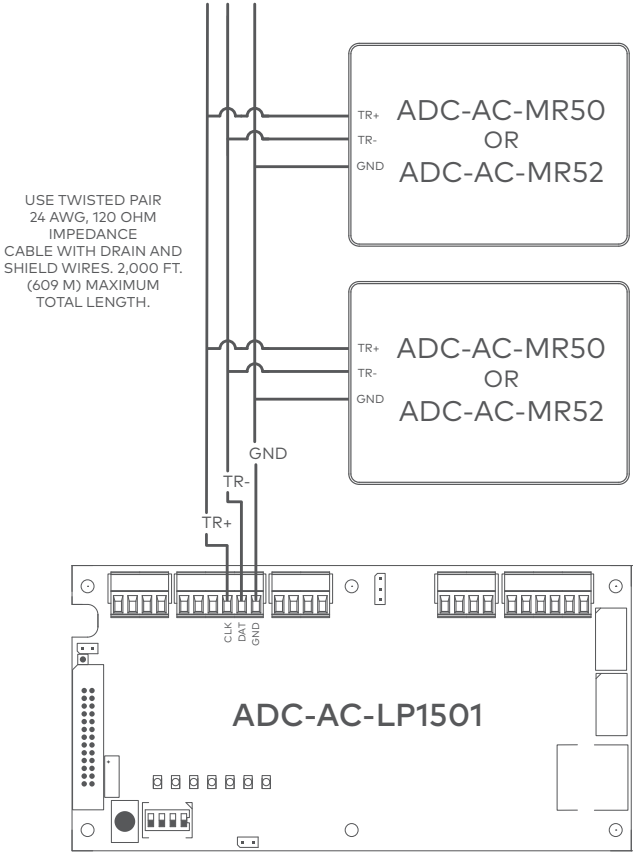
## Communication Wiring

The ADC-AC-MR52 communicates to an Alarm.com Door Controller using a 2-wire RS-485 interface.

The ADC-AC-MR52 allows for multi-drop communication on a bus of up to 2,000 feet (609 m). Use twisted pair (minimum 24 AWG) with drain wire and shield for communication. If the ADC-AC-MR52 is the last device on the communication bus, jumper J5 must be installed.

## RS-485 Wiring using the ADC-AC-LP1501 Door Controller

UP TO EIGHT TOTAL EXPANSION MODULES MAY BE WIRED. THE LAST EXPANSION MODULE ON THE BUS MUST HAVE JUMPER J5 INSTALLED FOR ADC-AC-MR52 MODULES AND J4 INSTALLED FOR ADC-ACX1 MODULES.

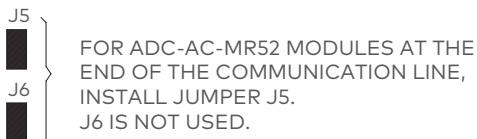


For ease of install, daisy chain expansion modules together. Wire each expansion module to the next module instead of wiring directly back to the controller.




Install jumpers according to the selected configuration.


## LINE TERMINATION



## 2-WIRE/4-WIRE SELECT

2W 4W  
 J3

INSTALL JUMPER ON 2W FOR 2-WIRE INTERFACE

~~2W 4W  
 J3~~



4-WIRE IS NOT SUPPORTED  
INSTALL JUMPER IN 2W POSITION

## Addressing

Flip the dip switches on the ADC-AC-MR52 expansion module according to the "Jumpers/Switches ON" column in the Access Control Devices table on the Alarm.com Dealer Website. These dipswitches are also displayed in the "Add Expansion Module" installation wizard. If these dipswitches are not set according to the website, the device and its connected readers and door hardware will not function properly with Alarm.com.

# Reader Wiring

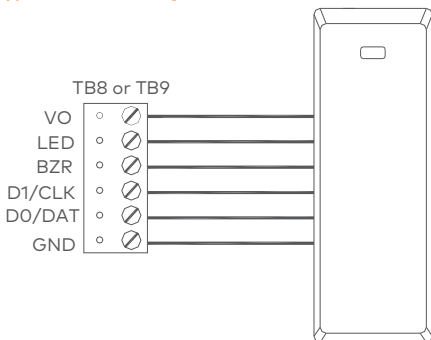
Each reader port supports a single Wiegand reader. Power to the reader is selectable: 12V DC ( $V_{IN}$  must be greater than 20V DC), or power is passed-through from the input voltage of the ADC-AC-MR52 (TB7-VIN), 180 mA maximum per reader port. Readers that require different voltage or have high current requirements must be powered separately. 22 AWG minimum recommended for readers.

| 12V PT  | READER POWER   |
|---|--|
|  | 12V DC IS AVAILABLE ON READER PORTS ( $V_{IN} \geq 20V DC$ ) |
|  | VIN POWER IS "PASSED THROUGH" TO READER PORTS                |

## J2 - READER PORT POWER SELECT

*If the input voltage to the ADC-AC-MR52 is 12V DC, jumper J2 MUST be in the PT position.*

### Typical Reader Wiring

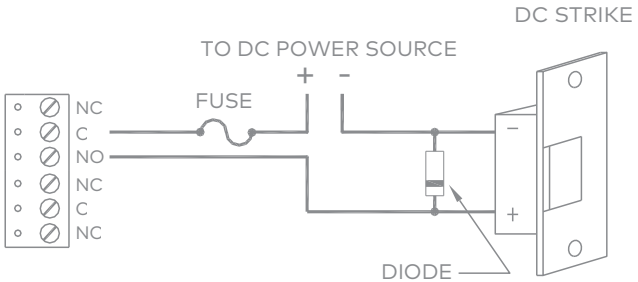


# Relay Wiring

Six Form-C contact relays are provided for controlling door lock mechanisms. 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. 18 AWG minimum recommended for electric locking hardware.

Load switching can cause abnormal contact wear and premature contact failure. Switching of inductive loads (strike) also causes EMI (electromagnetic interference), which may interfere with normal operation of other equipment. To minimize premature contact failure and to increase system reliability, a contact protection circuit may be used. The following circuit is recommended. Locate the protection circuit as close to the load as possible (within 12 inches [30 cm]), as the effectiveness of the circuit will decrease if it is located further away.

Use sufficiently large gauge wires for the load current to avoid voltage loss.



## DIODE SELECTION

- Diode current rating: 1x strike current
- Diode breakdown voltage: 4x strike voltage
- For 12V DC or 24V DC strike, diode 1N4002 (100V/1A) typical

# Input Wiring

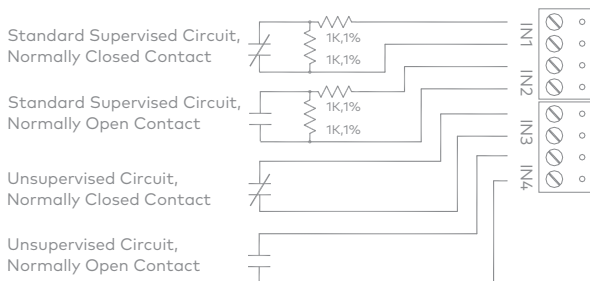
There are 8 inputs that can be used to monitor door position or request to exit devices. Input circuits can be configured as Unsupervised (2 states); reporting as open or closed contact, or Supervised (6 states); reporting as open or closed contact, open circuit, shorted circuit, grounded circuit\*, or foreign voltage\*.

A supervised input circuit requires adding two resistors with value of 1k ohm, 1% to the circuit to facilitate proper reporting and 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.*

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

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



# 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

12/24V DC, 550mA max.

450mA nominal @ 12V

270mA nominal @ 24V

## OUTPUT POWER

12V DC, 125 mA per reader

## COMMUNICATION

2-Wire RS-485

## INPUTS

Two dedicated reader inputs

Eight programmable inputs

One dedicated tamper input

One dedicated power monitor input

## OUTPUTS

Six relay outputs (5A @ 28V DC)

Single-wire LED control

Single-wire buzzer output

## CERTIFICATIONS

UL 294 recognized

CE compliant

RoHS

## DIMENSIONS (L X W X H)

6.0 x 8.0 x 1.0" (152 x 203 x 25 mm)

## TEMPERATURE

-40 – 167°F (-40 – 75°C) operational

-67 – 185°F (-55 – 85°C) storage

## OPERATING HUMIDITY

0-95% (non-condensing) RH

## 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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