

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.

EP-1502 Controller with Two Reader Interface

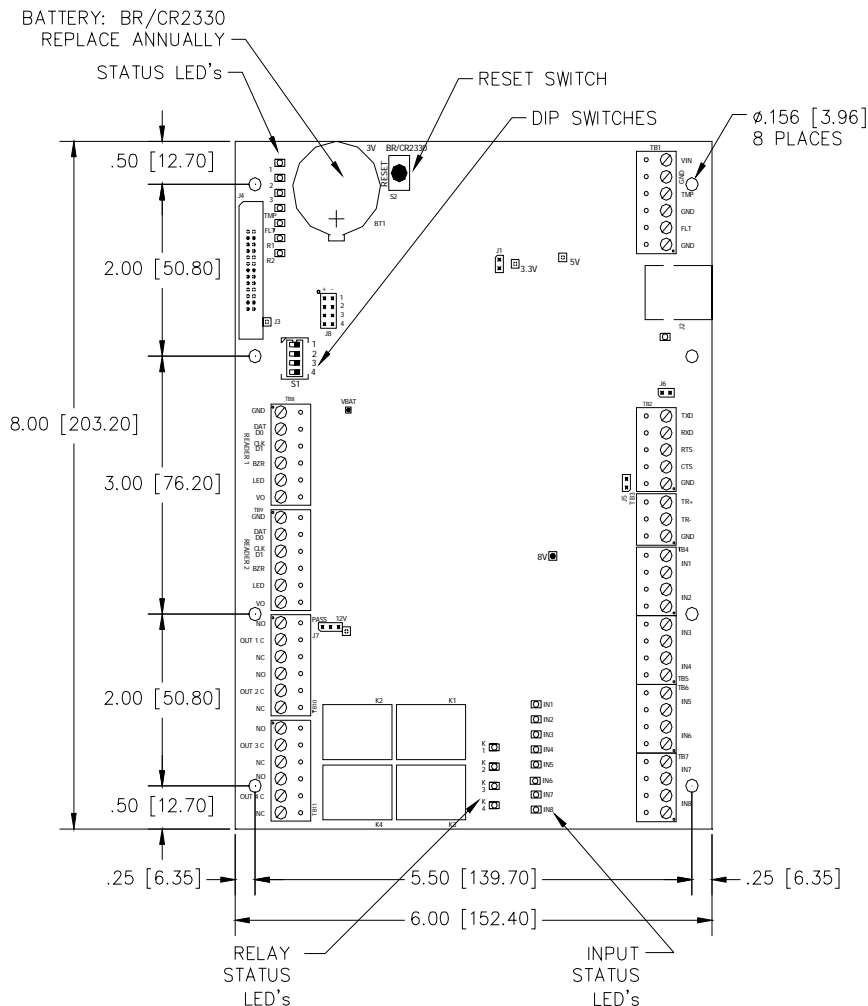
Installation and Specifications

1. General:

The EP-1502 controller provides a single board solution to control 2 doors. The EP-1502 holds the data base for the hardware configuration, and card holder database in nonvolatile memory. The event log buffer is stores in battery backed memory. Configuration data and event/status reports are exchanged with to the host via port 0, 10-BaseT/100Base-TX Ethernet interface or port 1, RS-232 interface. Additional I/O devices (SIO's) are communicated to via the SIO communication port, 2-wire RS-485.

Two physical barriers can be controlled with the EP-1502. Each reader port can accommodate a readhead that utilizes wiegand, magnetic stripe, or 2-wire RS-485 electrical signaling standards, one or two wire LED controls, and buzzer control (one wire LED mode only). Four form-c relay outputs may be used for strike control or alarm signaling. The relay contacts are rated at 5A @ 30Vdc, dry contact configuration. Eight inputs are provided for monitoring the door contacts, exit push buttons and alarm contacts. The EP-1502 requires 12-24Vdc for power. It is recommended that the EP-1502 be mounted .25" minimum above any conductive surface.

2. EP-1502 Hardware:



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3. EP-1502 Wiring and Set Up:

| CONNECTION | | |
|------------|----------|-----------------------------|
| TB8 | Reader 1 | GND: Ground |
| | | DAT/D0: Data/Data 0/TR- |
| | | CLK/D1: Clock/Data 1/TR+ |
| | | BZR: Reader Buzzer |
| | | LED: Reader LED |
| | | VO: Reader Power |
| TB9 | Reader 2 | GND: Ground |
| | | DAT/D0: Data/Data 0/TR- |
| | | CLK/D1: Clock/Data 1/TR+ |
| | | BZR: Reader Buzzer |
| | | LED: Reader LED |
| | | VO: Reader Power |
| TB10 | Out 1 | NO: Normally Open Contact |
| | | C: Common |
| | | NC: Normally Closed Contact |
| | Out 2 | NO: Normally Open Contact |
| | | C: Common |
| | | NC: Normally Closed Contact |
| TB11 | Out 3 | NO: Normally Open Contact |
| | | C: Common |
| | | NC: Normally Closed Contact |
| | Out 4 | NO: Normally Open Contact |
| | | C: Common |
| | | NC: Normally Closed Contact |

| CONNECTION | | |
|----------------------|-------------------------|---------------------|
| TB1 | Power Input | VIN: 12 to 24Vdc |
| | | GND |
| | Cabinet Tamper Input | TMP |
| | | GND |
| Power Fault Input | FLT | |
| | GND | |
| TB2 | Host Port 1 | TXD (RS-232) |
| | | RXD (RS-232) |
| | | RTS (RS-232) |
| | | CTS (RS-232) |
| | | GND (RS-232) |
| TB3 | SIO Port | TR+ (2-wire RS-485) |
| | | TR- (2-wire RS-485) |
| | | GND (2-wire RS-485) |
| TB4 | Input 1 | IN1 |
| | | IN1 |
| | Input 2 | IN2 |
| | | IN2 |
| TB5 | Input 3 | IN3 |
| | | IN3 |
| | Input 4 | IN4 |
| | | IN4 |
| TB6 | Input 5 | IN5 |
| | | IN5 |
| | Input 6 | IN6 |
| | | IN6 |
| TB7 | Input 7 | IN7 |
| | | IN7 |
| | Input 8 | IN8 |
| | | IN8 |

The EP-1502 controller hardware is configured with a number of jumpers and 4 position DIP switch (S1). These jumpers/switches set the port interface, end of line termination, and operating mode configuration. Please refer to the tables below for the settings:

JP1 through JP8 Jumpers:

| JUMPERS | SET AT | DESCRIPTION |
|---------|--------|--|
| J1 | N/A | Factory Use Only |
| J2 | N/A | 10base-T/100base-Tx Ethernet Connection (Port 0) |
| J3 | N/A | Factory Use Only |
| J4 | N/A | Factory Use Only |
| J5 | OFF | Port 2 Rs-485 Eol Terminator is Off |
| | ON | Port 2 Rs-485 Eol Terminator is On |
| J6 | N/A | Factory Use Only |
| J7 | | Reader Power Select *** See Note 1 *** |
| | 12V | 12Vdc at Reader Ports |
| | PASS | Vin "Pass Through" to Reader Ports |
| J8-1 | N/A | Remote Status Led #1, See Note 2 |
| J8-2 | N/A | Remote Status Led #2, See Note 2 |
| J8-3 | N/A | Remote Status Led #3, See Note 2 |
| J8-4 | N/A | Remote Status Led #4, See Note 2 |

Note 1: The input power (VIN) must be 20Vdc minimum if the 12Vdc selection is to be used.

Note 2: Observe POLARITY connection to LED. External current limiting is not required.

S1 DIP Switch:

Set DIP switch as required.

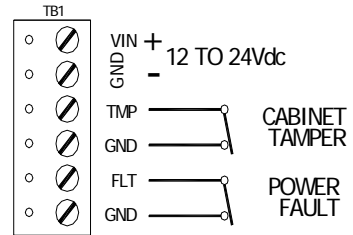
| S1-1 | S1-2 | S1-3 | S1-4 | SELECTION |
|------|------|------|------|---|
| OFF | OFF | OFF | OFF | Normal Operating Mode |
| ON | OFF | OFF | OFF | Configuration Through Port 1 |
| OFF | ON | OFF | OFF | Undefined |
| ON | ON | OFF | OFF | Use Default TCP/IP Address: 192.168.0.251 |
| | | | | All Other Settings Undefined |

S2 resets the EP-1502.

4. Input Power, Cabinet Tamper and UPS Fault Input Wiring:

The EP-1502 requires 12-24Vdc power. Locate power source as close to the unit as possible. Connect power with minimum of 18AWG wire. **Connect the GND signal to earth ground in ONE LOCATION within the system! Multiple earth ground connections may cause ground loop problems and is not advised.**

Observe POLARITY on 12-24Vdc input!



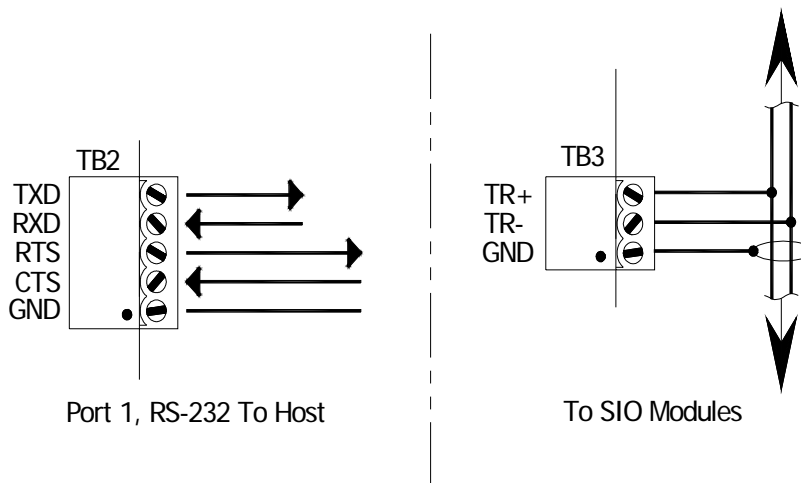
There are two dedicated inputs for cabinet tamper and UPS fault monitoring. Normal (safe) condition is a closed contact. If these inputs are not used, install a jumper wire.

5. Communication Wiring:

The EP-1502 controller communicates to the host via the on-board 10-BaseT/100Base-TX Ethernet interface (port 0) and/or RS-232 interface (port 1). RS-232 interface is for direct one to one connection to a host computer port or via modem, 25 feet maximum.

The SIO communication port (TB2) is a 2-wire RS-485 interface which can be used to connect additional I/O panels (SIO's). The interface allows multi-drop communication on a single bus of up to 4,000 feet (1,200 m). Use twisted pairs (minimum 24 AWG) with an overall shield for communication.

IMPORTANT NOTE! Install the termination jumper **ONLY** on the panel at each end of the RS-485 bus. Failure to do so will compromise the proper operation of the communication channel!

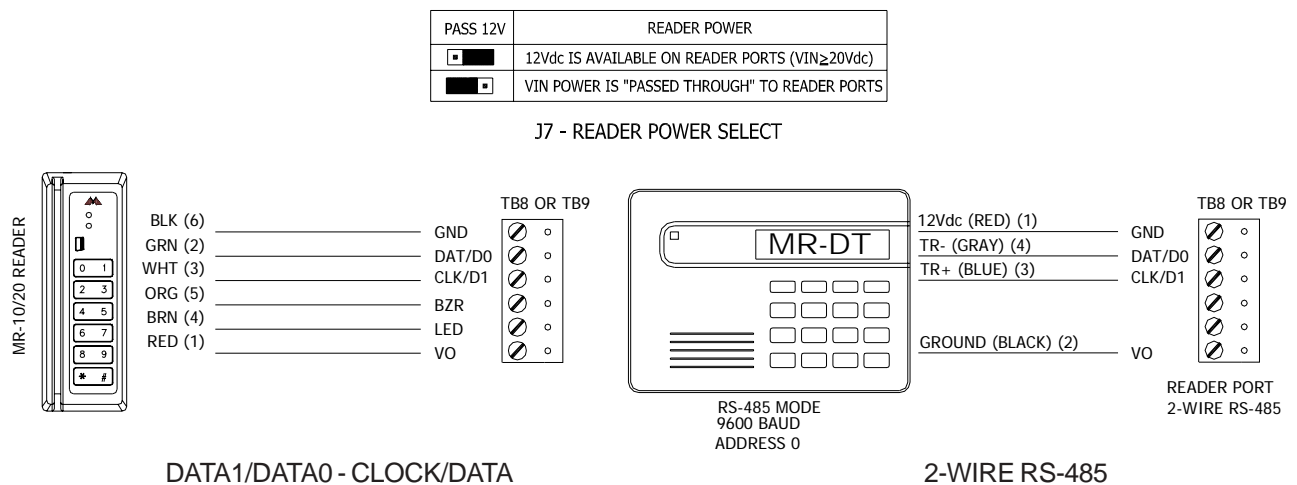


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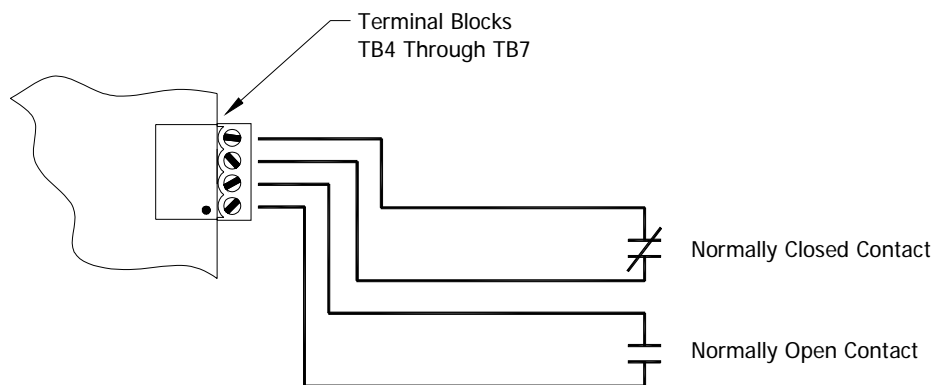
6. Reader Wiring:

Each reader port supports wiegand, magnetic stripe, and 2-Wire RS-485 electrical interfaces. Voltage at the reader port (VO) is passed-through from the input voltage of the EP-1502 (TB1-VIN) and is current limited to 150mA for each reader port. Readers that require different voltage or have high current requirements should be powered separately. Refer to the reader manufacture specifications for cabling requirements. In the 2-wire LED mode the Buzzer output is used to drive the second LED. Reader port configuration is set via the host software.



7. Input Circuit Wiring:

Typically, these inputs are used to monitor door position, request to exit, or alarm contacts.



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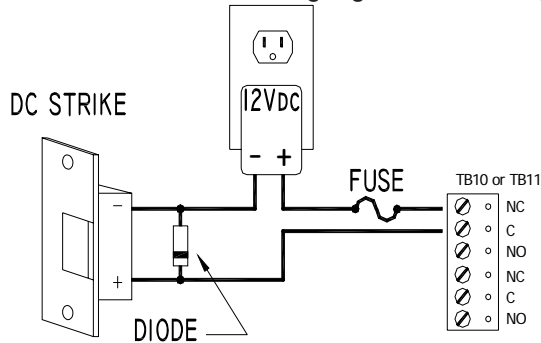
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8. Relay Circuit Wiring:

Four relays are provided for controlling door lock mechanisms or alarm signaling. The relay contacts are rated at 5A @ 30Vdc, dry contact configuration. Each relay has a Common pole (C), a Normally Open pole (NO) and a Normally Closed pole (NC). When you are controlling the delivery of power to the door strike, the Normally Open and Common poles are used. When you are momentarily removing power to unlock the door, as with a mag lock, the Normally Closed and Common poles are used. Check with local building codes for proper egress door installation.

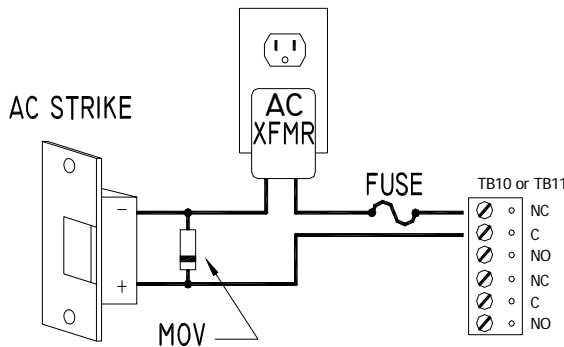
Door lock mechanisms can generate feedback to the relay circuit that can cause damage and premature failure of the relay. For this reason, it is recommended that either a diode or MOV (metal oxide varistor) be used to protect the relay.

Wire should be of sufficient gauge to avoid voltage loss.



Diode Selection:

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



MOV Selection:

Clamp voltage: 1.5x Vac RMS. For 24Vac strike, Panasonic ERZ-C07DK470 typical.

9. Memory and Real Time Clock Backup Battery:

The event log buffer and the real time clock are backed up by a 3V lithium battery. Without power being applied to the EP-1502, the battery will retain configurations and transactions for 3 months. This battery should be replaced annually to insure that proper backup functionality is maintained. Remove the insulator from the battery holder after installation. Battery type: BR2325, BR2330, or CR2330.

10. Status LEDs:

Power-up: All LED's **OFF**.

Initialization: LED's are sequenced during initialization. If the sequence stops or repeats, contact technical support.

Running: After the above sequence, the LEDs have the following meanings:

| LED | DESCRIPTION |
|-----|--|
| 1 | Off-Line / On-Line and Battery Status Off-Line = 20% ON, On-Line = 80% ON Double Flash if Battery is Low |
| 2 | Primary Host Communication Activity (Serial Port 1) |
| 3 | Internal SIO Communication Activity |
| TMP | External SIO Communication Activity |
| FLT | Undefined |
| R1 | Reader 1: Clock/Data or D1/D0 Mode = Flashes when Data is Received, Either Input. RS-485 Mode = Flashes when Transmitting Data |
| R2 | Reader 2: Clock/Data or D1/D0 Mode = Flashes when Data is Received, Either Input. RS-485 Mode = Flashes when Transmitting Data |
| D16 | Flashes with Host Communication (Ethernet Port 0) |
| YEL | Ethernet Speed: OFF = 10Mb/S, ON = 100Mb/S |
| GRN | OFF = No Link, ON = Good Link, Flashing = Ethernet Activity |
| IN1 | Input IN1 Status: OFF = Inactive, ON = Active, Flash = Trouble |
| IN2 | Input IN2 Status: OFF = Inactive, ON = Active, Flash = Trouble |
| IN3 | Input IN3 Status: OFF = Inactive, ON = Active, Flash = Trouble |
| IN4 | Input IN4 Status: OFF = Inactive, ON = Active, Flash = Trouble |
| IN5 | Input IN5 Status: OFF = Inactive, ON = Active, Flash = Trouble |
| IN6 | Input IN6 Status: OFF = Inactive, ON = Active, Flash = Trouble |
| IN7 | Input IN7 Status: OFF = Inactive, ON = Active, Flash = Trouble |
| IN8 | Input IN8 Status: OFF = Inactive, ON = Active, Flash = Trouble |
| K1 | Relay K1: ON = Energized |
| K2 | Relay K2: ON = Energized |
| K3 | Relay K3: ON = Energized |
| K4 | Relay K4: ON = Energized |

11. Specifications:

The interface is for use in low voltage, class 2 circuit only.

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

Primary Power: 12-24Vdc \pm 10%, 500mA maximum (reader current not included)
12Vdc @ 250mA (plus reader current) nominal
24Vdc @ 150mA (plus reader current) nominal

Memory and Clock
Backup Battery: 3 Volt Lithium, type BR2325, BR2330 or CR2330

Host Communication: Ethernet: 10BaseT/100Base-TX, and RS-232 9,600 to 115,200 bps, asynchronous, half-duplex, 1 start bit, 8 data bits, and 1 stop bit.

SIO Communication 2-wire RS-485, 2,400 to 38,400 bps, asynchronous, half-duplex, 1 start bit, 8 data bits, and 1 stop bit.

Inputs: 2 dedicated for tamper and UPS fault monitoring.
8 for door position monitoring, request to exit or alarm contacts.

Relays: 4, Form-C, 5A @ 30Vdc, resistive.

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Reader Interface:

Reader Power: 12Vdc±10% regulated, current limited to 150mA for each reader.
(jumper selectable) or
12 to 24Vdc±10% (input voltage passed through) current limited to 150mA for each reader.

Data Inputs: TTL compatible inputs, mag stripe and wiegand standards supported. Maximum cable length: 500' (152m)

RS-485 Mode: 9600 bps, asynchronous, half-duplex, 1 start bit, 8 data bits, and 1 stop bit. Maximum cable length: 4000' (1,200m).

LED Output: TTL levels, high>3V, Low<0.5V, 5mA source/sink maximum.

Buzzer Output: TTL levels, high>3V, Low<0.5V, Low=Active, 5mA source/sink maximum.

Cable requirements:

Power: 1 twisted pair, 18 AWG

Ethernet: CAT-5

RS-485: 24AWG, 4,000ft (1,200m) maximum, twisted pair(s) with an overall shield.

RS-232: 24AWG, 25ft (7.6m) maximum.

Alarm Input: 1 twisted pair, 30 ohms maximum, typically 22 AWG @ 1000ft (300m).

Environmental:

Temperature: 0 to 70 °C, operating, -55 to +85 °C, storage

Humidity: 0 to 95% RHNC

Mechanical:

Dimension: 8 in. (203.2mm) W x 6 in. (152.4mm) L x 1 in. (25mm) H

Weight: 9 oz (255 gm) nominal, board only

Warranty

Mercury Security Corporation 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 Corporation 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 Corporation 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.

Returned units are repaired or replaced from a stock of reconditioned units. Returns must be accompanied by a return authorization number (RMA) 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 Corporation 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 Corporation's liability does not extend beyond the purchase price of the product.