

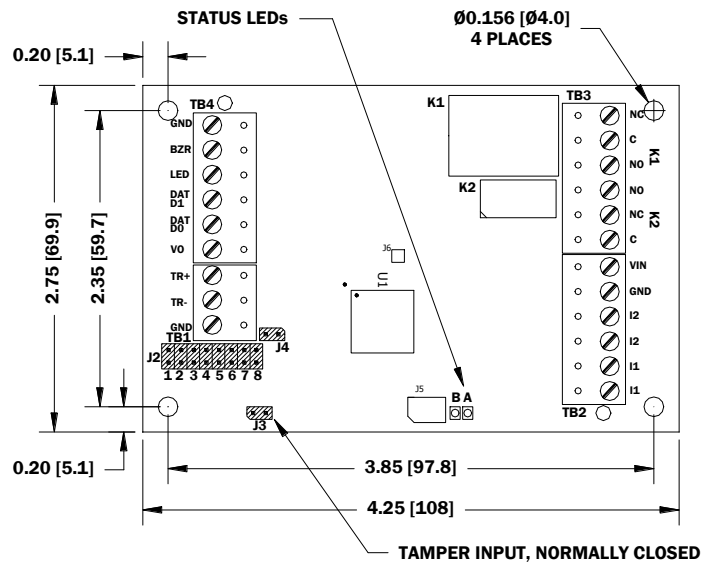
# MR50 READER INTERFACE

## Installation and Specifications:

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.

### 1. General:

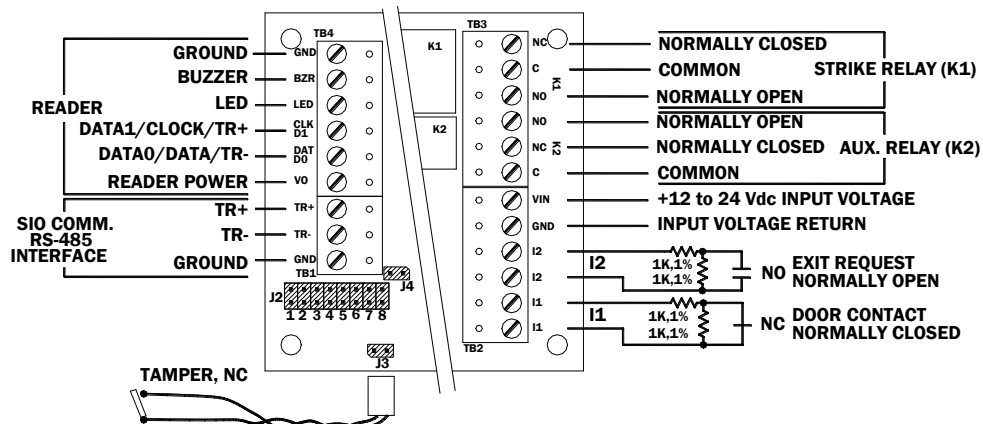
The MR50 reader interface provides a solution to the OEM system integrator for interfacing to a TTL/Wiegand/RS-485 type reader and door hardware. The MR50 can accept data from a reader with clock/data, Wiegand signaling or 2-wire RS-485, also provides a tri-stated LED control and buzzer control. Two Form-C contact relay outputs may be used for strike control or alarm signaling. Two inputs are provided for monitoring the door contact and exit push button. Communication to the interface is accomplished via a 2-wire RS-485 interface. The MR50 requires 12 to 24 Vdc for power.



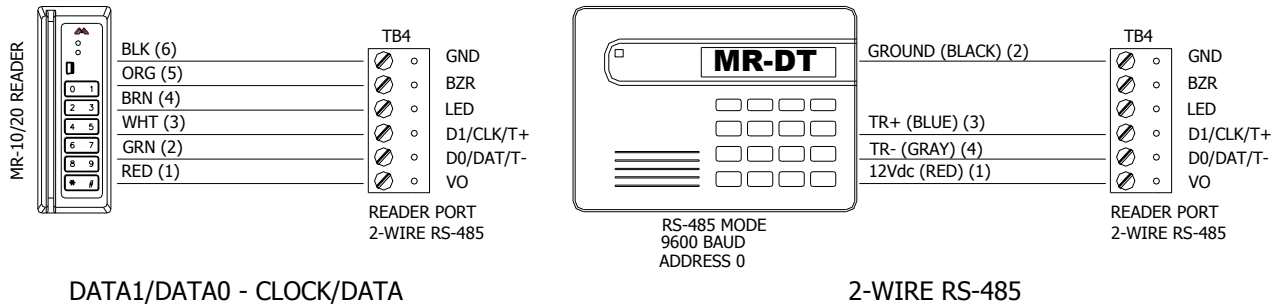
### 2. Power, Reader and Door Hardware Wiring:

All interconnections to the interface are via quick-disconnect terminal blocks. The MR50 requires filtered 12 to 24 Vdc±10% for power. The MR50 supports clock/data, Wiegand or 2-wire RS-485 reader interface signaling. Two inputs are typically used for door contact and exit push button monitoring. End of line resistors are required for line supervision.

**Note:** The input power is passed through to the reader terminal strip and is available for powering a reader. Care must be taken to insure that the input voltage is within the voltage range of the reader.

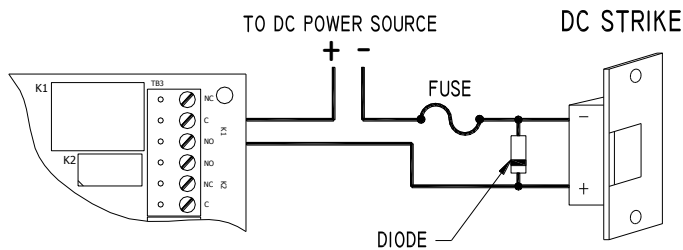


## Reader Wiring:



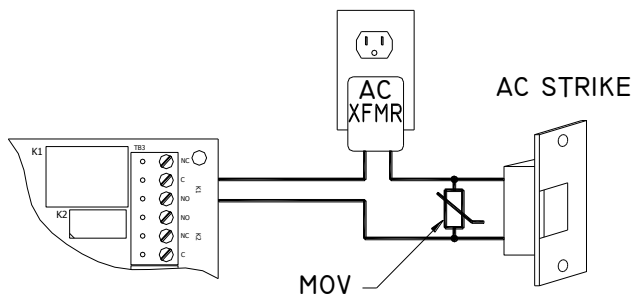
## Door Strike Relay Wiring:

Two Form-C contact relays are provided for controlling door strike or other devices. The contact ratings are 5 A for relay K1 and 1 A for relay K2. 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, contact protection circuit must be used. The following two circuits are 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 far away.



### Diode Selection:

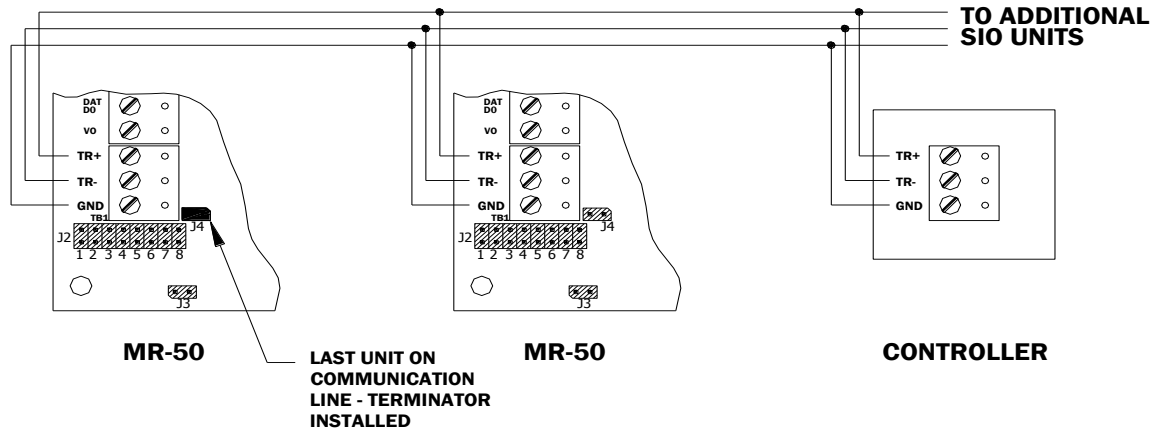
Diode current rating: 1x strike current  
 Diode breakdown voltage: 4x strike voltage  
 For 12 Vdc or 24 Vdc strike, diode 1N4002 (100V/1A) typical



### MOV Selection:

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

### 3. Communication to a Controller:



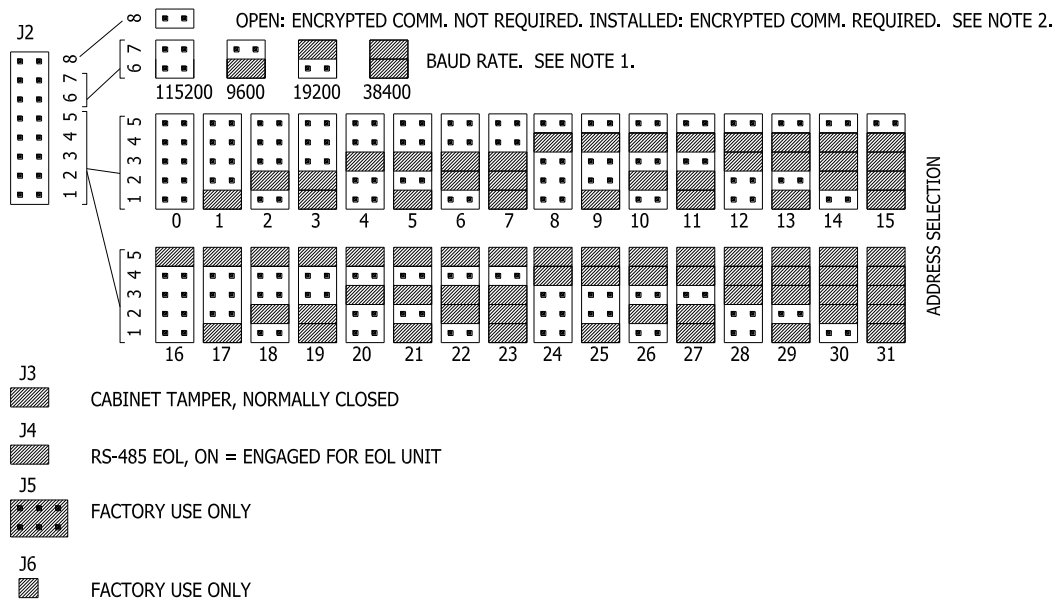
The MR50 communicates to a Mercury Security intelligent controller (EP2500 for example) via a half duplex multi-drop 2-wire RS-485 interface. The total cable length is limited to 4,000 feet (1,219 meters). Shielded cable of 24 AWG with characteristic impedance of 120 ohm is specified for the 2-wire RS-485 interface. The last device on each end of the communication line should have the terminator installed (set jumper J4 on).

### Address, Baud Rate and Encryption Configuration Jumpers:

Each Interface (MR50, MR52, etc.) must be configured to have a unique address and correct baud rate. The address and baud rate are selected by installing the specified jumpers.

**Note 1:** Firmware revisions prior to 1.39.1, the 115200 baud rate setting is 2400 baud.

**Note 2:** Firmware revisions prior to 1.39.1, jumper 8 is not defined, remove jumper.



#### 4. Status LEDs:

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

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

The **A LED** is turned **ON** at the beginning of initialization.

**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:

Non-encrypted communication: 1 second rate, 80% **ON**

Encrypted communication:

.1 S **ON**, .1 S **OFF**, .1 S **ON**, .1 S **OFF**, .1 S **ON**, .1 S **OFF**, .1 sec **ON**, .3 S **OFF**

**A LED Error Indication:**

Waiting for application firmware to be downloaded: .1 S **ON**, .1 S **OFF**.

**B LED:** SIO Communication Port Status:

Indicates communication activity on the SIO communication port

#### 5. Specifications:

The Interface is for use in low voltage, class 2 circuits only.

Primary Power: 12 to 24 Vdc  $\pm 10\%$ , 150 mA maximum (plus reader current)  
12 Vdc @ 110 mA (plus reader current) nominal  
24 Vdc @ 60 mA (plus reader current) nominal

Outputs: 2, Form-C contact relays: K1: 5 A @ 30 Vdc, K2: 1 A @ 30 Vdc

Inputs: 2 unsupervised/supervised, standard EOL, 1k/2k ohm, 1% 1/4 watt  
1 unsupervised, dedicated for cabinet tamper

Reader Interface:

Reader power: 12 to 24 Vdc  $\pm 10\%$  (input voltage passed through)  
Reader LED output: TTL compatible, high > 3 V, low < 0.5 V, 5 mA source/sink maximum  
Buzzer output: Open collector, 5 Vdc open circuit maximum, 10 mA sink maximum  
Data Inputs: TTL compatible, mag stripe and Wiegand standards supported.  
RS-485 Mode: 9600 bps, asynchronous, half-duplex, 1 start bit, 8 data bits, and 1 stop bit. Maximum cable length: 2000 ft (609.6m)

Communication: 2-wire RS-485: 9600, 19200, 38400 or 115200 bps

Cable Requirements:

Power: 18 AWG, 1 twisted pair  
RS-485 I/O devices: 24 AWG, 120 ohm impedance, twisted pair with shield, 4,000 ft (1,219 m) maximum  
Alarm Inputs: 1 twisted pair per input, 30 ohms maximum, typically 22 AWG @ 1000 ft (304.8 m)  
Outputs: As required for the load  
Reader data (TTL): 18 AWG, 6 conductor, 500 ft (150 m) maximum  
Reader data (RS-485): 24 AWG, 120 ohm impedance, twisted pair with shield, 2,000 ft (609.6 m) maximum

Mechanical:

Dimension: 4.25 in (108 mm) W x 2.75 in (70 mm) L x 1 in (25.4mm) H  
Weight: 4 oz. (120 g) nominal

## Specifications (continued):

### Environment:

Temperature: -55 to +85 °C, storage, -40 to +75 °C, operating  
Humidity: 10 to 95% RHNC

### 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.