

EP1502 Intelligent Controller

with Two Reader Interface

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.

Installation and Specifications:

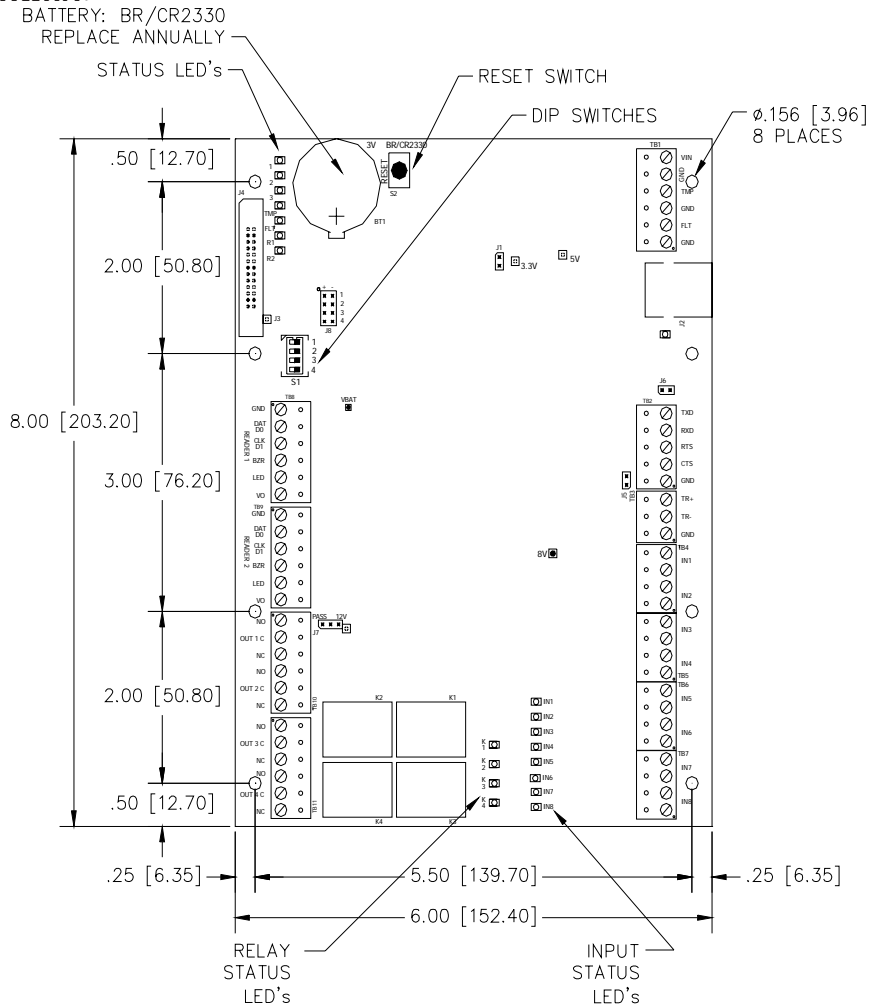
1. General:

The EP1502 intelligent controller provides decision making, event reporting, and database storage for the Mercury hardware platform. Two reader interfaces provide control for two doors.

It communicates with the host via on-board 10-BaseT/100Base-TX Ethernet port. Alternatively, port 1 (RS-232) can be used for host communication.

Two physical barriers can be controlled with the EP1502. 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 EP1502 requires 12-24Vdc for power. It is recommended that the EP1502 be mounted .25" minimum above any conductive surface.

2. EP1502 Hardware



Information subject to change without notice.

3. EP1502 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
	Power Fault Input	FLT
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

Jumpers:

The EP1502 processor hardware interface is configured using jumpers to setup the port interface and end of line termination.

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.

DIP Switches:

The four switches on S1 DIP switch configure the operating mode of the EP1502 processor. DIP switches are read on power-up except where noted. Pressing switch S2 causes the EP1502 to reset.

1	2	3	4	Definitions
OFF	OFF	X	OFF	Normal operating mode.
ON	X	X	X	After initialization, enable default User Name (admin) and Password (password). The switch is read on the fly, no need to re-boot.
OFF	ON	X	OFF	Use factory default communication parameters.
ON	ON	X	OFF	Use OEM default communication parameters. Contact system manufacture for details See. Bulk Erase below.
X	X	ON	X	Disable TLS secure link. Switch is read only when logging on.

All other switch settings for unassigned and are reserved for future use.

Factory Default Communication Parameters:

Network: static IP address: 192.168.0.251

Communication address: 0

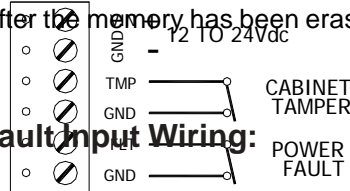
Primary Host port: IP server, no encryption, port 3001.

Port 1: RS-232, 38400 baud, no encryption, no flow control.

Bulk Erase Configuration Memory:

Use the bulk erase function to erase all configuration and cardholder databases. When power is applied with S1 switches set to 1 & 2 ON and 3 & 4 OFF, there is a 10-second window that if switch 1 or 2 is changed to the OFF position memory is erased. The LEDs flash the following pattern when in the reset window: LED 1 & 2 and LED 3 & 4 flash alternately at .5 second rate. When erasing memory, LED 2 flashes at a 2 second rate; **DO NOT CYCLE POWER**. It takes less than 60 seconds to erase the memory. LEDs 1 and 4 flash for 10 seconds after the memory has been erased, then the EP-1502 will re-boot.

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



The EP1502 requires 12-24Vdc power. Locate power source as close to the unit as possible. Connect power with minimum of 18 AWG 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!

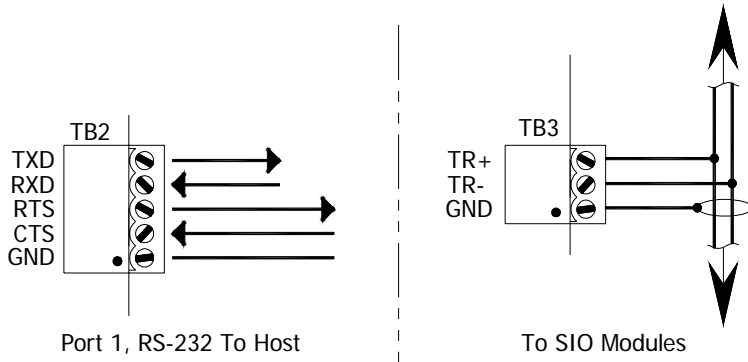
There are two dedicated inputs for cabinet tamper and UPS fault monitoring. Normal (safe) condition is a closed contact. If these inputs are not used, install a jumper wire.

5. Communication Wiring:

The EP1502 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 (TB3) 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!

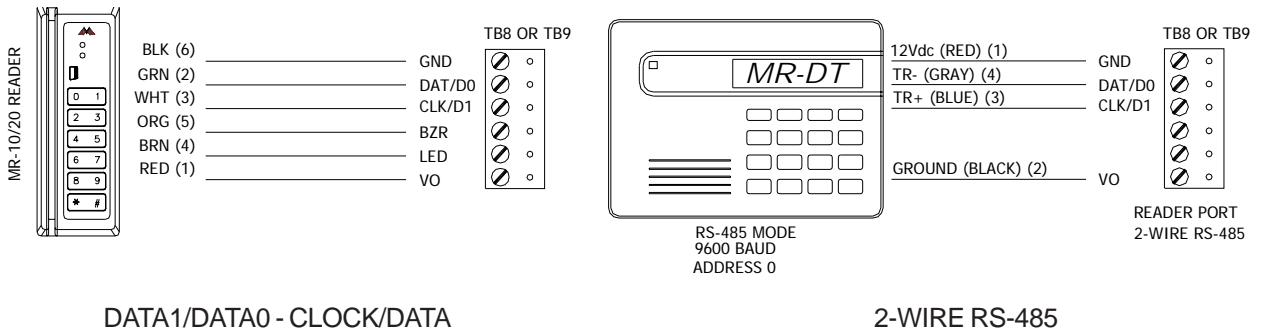


6. Reader Wiring:

Each reader port supports wiegand, magnetic stripe, and 2-wire RS-485 electrical interfaces. Power to the reader is selectable: 12Vdc (VIN must be greater than 20Vdc), or power is passed-through (PT) from the input voltage of the EP1502 (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 in used to drive the second LED. Reader port configuration is set via the host software.

PASS 12V	READER POWER
<input type="checkbox"/>	12Vdc IS AVAILABLE ON READER PORTS (VIN ≥ 20Vdc)
<input checked="" type="checkbox"/>	VIN POWER IS "PASSED THROUGH" TO READER PORTS

J7 - READER POWER SELECT

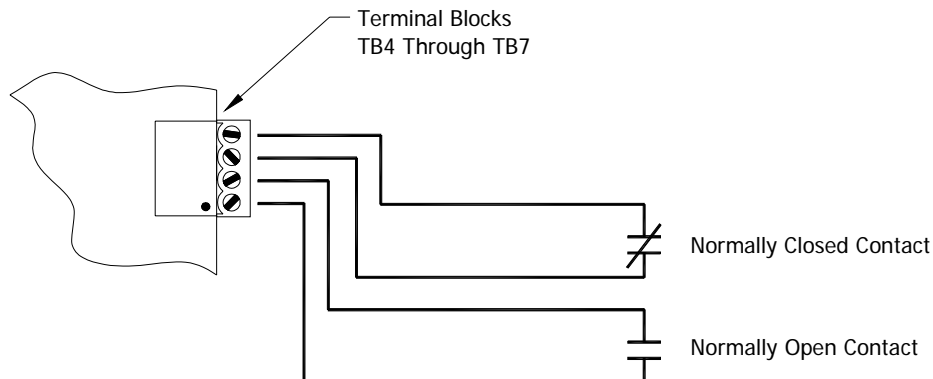


DATA1/DATA0 - CLOCK/DATA

2-WIRE RS-485

7. Input Circuit Wiring:

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

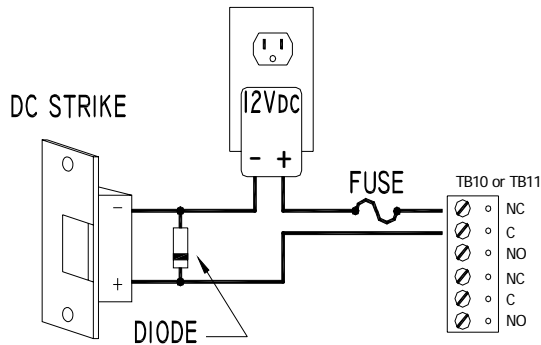


Information subject to change without notice.

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.

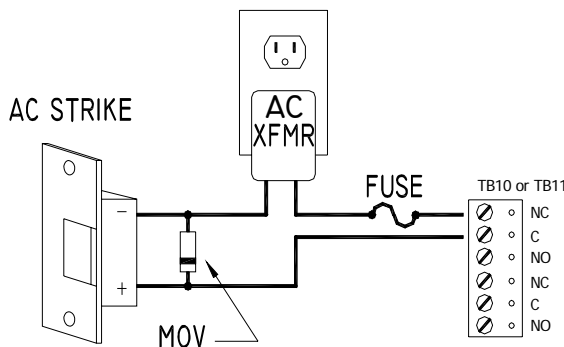


Diode Selection:

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 static RAM and the real time clock are backed up by a lithium battery when input power is removed. This battery should be replaced annually. If data in the static RAM is determined to be corrupt after power up, all data, including flash memory, is considered invalid and is erased. All configuration data must be re-downloaded. 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 1, 2, 3, TMP, FLT, R1, R2, IN1, IN2, IN3, IN4, IN5, IN6, IN7 and IN8 are sequenced during initialization. LED's 1, 3, and TMP are turned ON for approximately 4 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, about 3 seconds without a card database. Each 10,000 cards will add about 3 seconds to the application initialization. When LED's 1, 2, 3 and TMP 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 one of the steps below.

1. Power-up and tag database as invalid:
Remove input power to the EP1502, place an insulator under the battery clip, wait 5-10 seconds, remove insulator, reapply input power.
2. Power-up without loading database into RAM:
Remove input power to the EP1502, set DIP to a default mode (in a default mode, the database is not loaded into RAM), reapply input power.
3. Erase all of the configuration and databases (also erases card database for security reasons):
See procedure in DIP switch note in section 2.

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

Running: After initialization is complete, 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	Host Communication Activity (Ethernet or Serial Port 1)
3	Internal SIO Communication Activity
TMP	External SIO Communication Activity
FLT	Unassigned
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.
Reader Interface:	
Reader Power: (jumper selectable)	12Vdc±10% regulated, current limited to 150mA for each reader. 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.