MR16out PROCESSOR

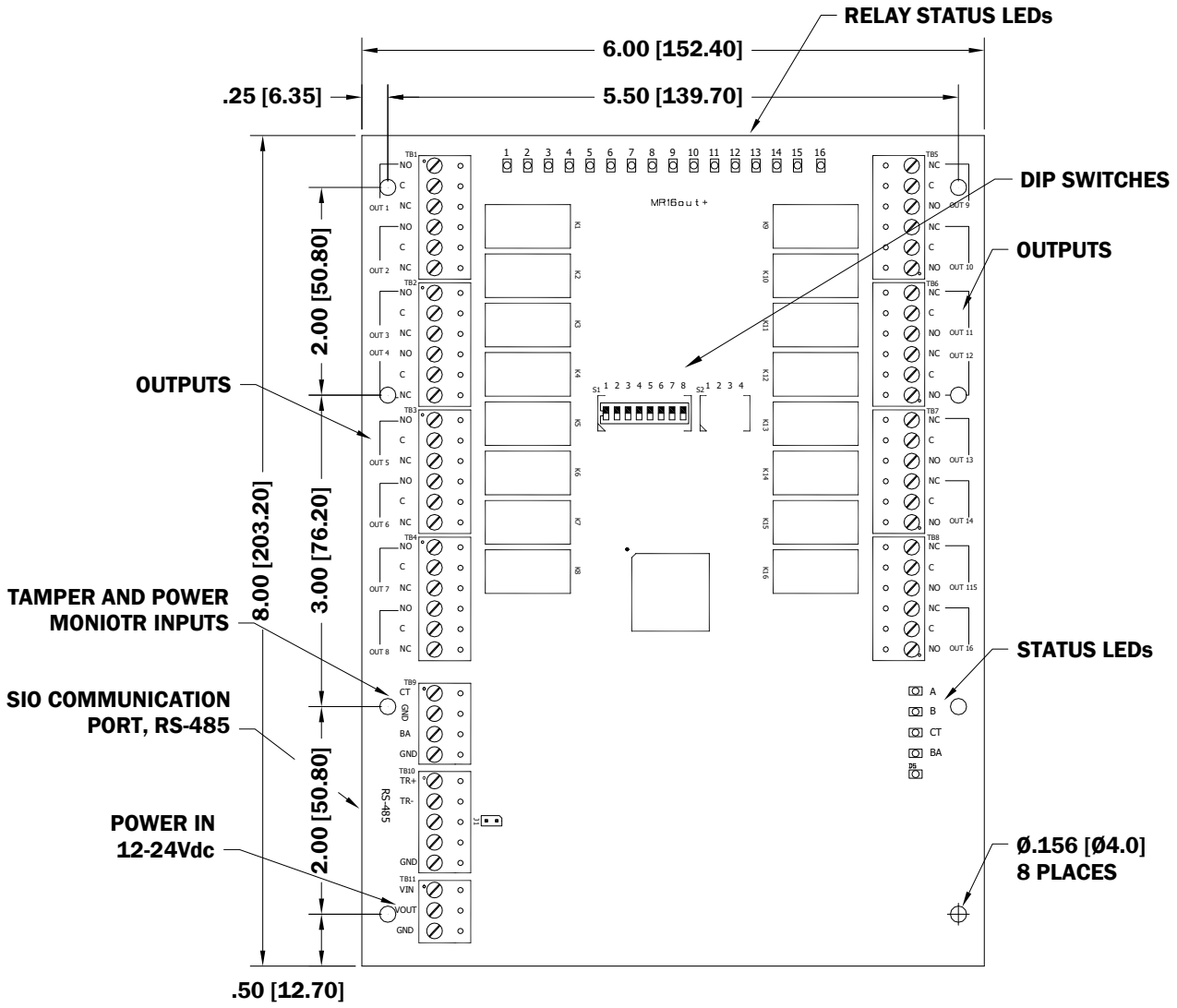
Series 3

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:

General:

The MR16out processor provides a solution to the OEM system integrator for output control. The controller has 16 form-C contact relays for load switching. Additionally, 2 digital inputs are provided for tamper and power fault status monitoring. The processor requires 12 to 24 Vdc for power.



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Compatibility:

The MR16OUT is not functional unless it is connected to a controller board (refer to document T71-000-020 Rev. B for comprehensive installation instructions). The MR16OUT is compatible with the following AccessNsite UL Listed Commercial Proprietary Burglar Alarm and Access Control subassemblies:

- E2M — LifeSafety Power 20” x 16” x 4.5” Enclosure
- E4M — LifeSafety Power 24” x 20” x 6.5” Enclosure
- E8M — LifeSafety Power 36” x 30” x 6.5” Enclosure
- FPO75 — LifeSafety Power 6A/12V or 3A/24V 75W Power Supply
- FPO150 — LifeSafety Power 12A/12V or 6A/24V 150W Power Supply
- FPO250 — LifeSafety Power 20A/12V or 10A/24V 250W Power Supply
- C8P — LifeSafety Power, Power Controller Module
- D8P — LifeSafety Power, Power Distribution Module
- LP1501 — Mercury Intelligent Controller w/ One Access Point Interface
- LP1502 — Mercury Intelligent Controller w/ Two Access Point Interface
- LP2500 — Mercury Intelligent Controller
- LP4502 — Mercury High Capacity Intelligent Controller
- MUX8 — Mercury 8/1 RS-485 Multiplexer

Terminal Blocks:

CONNECTION		
TB1-1	Out 1	NO
TB1-2		C
TB1-3		NC
TB1-4	Out 2	NO
TB1-5		C
TB1-6		NC
TB2-1	Out 3	NO
TB2-2		C
TB2-3		NC
TB2-4	Out 4	NO
TB2-5		C
TB2-6		NC
TB3-1	Out 5	NO
TB3-2		C
TB3-3		NC
TB3-4	Out 6	NO
TB3-5		C
TB3-6		NC
TB4-1	Out 7	NO
TB4-2		C
TB4-3		NC
TB4-4	Out 8	NO
TB4-5		C
TB4-6		NC
TB5-1	Out 10	NO
TB5-2		C
TB5-3		NC
TB5-4		NO

CONNECTION		
TB6-1	Out 12	NO
TB6-2		C
TB6-3		NC
TB6-4	Out 11	NO
TB6-5		C
TB6-6		NC
TB7-1	Out 14	NO
TB7-2		C
TB7-3		NC
TB7-4	Out 13	NO
TB7-5		C
TB7-6		NC
TB8-1	Out 16	NO
TB8-2		C
TB8-3		NC
TB8-4	Out 15	NO
TB8-5		C
TB8-6		NC
TB9-1	Cabinet Tamper	CT
TB9-2		GND
TB9-3	Power Fault	BA
TB9-4		GND
TB10-1	RS-485	TR+
TB10-2		TR-
TB10-3		
TB10-4		
TB10-5		GND
TB11-1		VIN

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TB5-5	Out 9	C
TB5-6		NC

TB11-2	Power	VOUT
TB11-3		GND

Jumper and DIP Switch Usage:

JUMPER	DESCRIPTION
J1	RS-485 termination, install in first and last units only

All other jumper are for factory use only

Switches 1 to 5 select the device address. Switch 6 and 7 select the communication baud rate. Switch 8 enables encrypted communication. All other configuration settings are set via host software.

S8	S7	S6	S5	S4	S3	S2	S1	SELECTION
			OFF	OFF	OFF	OFF	OFF	Address 0
			OFF	OFF	OFF	OFF	ON	Address 1
			OFF	OFF	OFF	ON	OFF	Address 2
			OFF	OFF	OFF	ON	ON	Address 3
			OFF	OFF	ON	OFF	OFF	Address 4
			OFF	OFF	ON	OFF	ON	Address 5
			OFF	OFF	ON	ON	OFF	Address 6
			OFF	OFF	ON	ON	ON	Address 7
			OFF	ON	OFF	OFF	OFF	Address 8
			OFF	ON	OFF	OFF	ON	Address 9
			OFF	ON	OFF	ON	OFF	Address 10
			OFF	ON	OFF	ON	ON	Address 11
			OFF	ON	ON	OFF	OFF	Address 12
			OFF	ON	ON	OFF	ON	Address 13
			OFF	ON	ON	ON	OFF	Address 14
			OFF	ON	ON	ON	ON	Address 15
			ON	OFF	OFF	OFF	OFF	Address 16
			ON	OFF	OFF	OFF	ON	Address 17
			ON	OFF	OFF	ON	OFF	Address 18
			ON	OFF	OFF	ON	ON	Address 19
			ON	OFF	ON	OFF	OFF	Address 20
			ON	OFF	ON	OFF	ON	Address 21
			ON	OFF	ON	ON	OFF	Address 22
			ON	OFF	ON	ON	ON	Address 23
			ON	ON	OFF	OFF	OFF	Address 24
			ON	ON	OFF	OFF	ON	Address 25
			ON	ON	OFF	ON	OFF	Address 26
			ON	ON	OFF	ON	ON	Address 27
			ON	ON	ON	OFF	OFF	Address 28
			ON	ON	ON	OFF	ON	Address 29
			ON	ON	ON	ON	OFF	Address 30
			ON	ON	ON	ON	ON	Address 31
	OFF	OFF						115,200 BPS, See note 1 below.
	OFF	ON						9,600 BPS
	ON	OFF						19,200 BPS
	ON	ON						38,400 BPS
OFF								Encrypted communication not required See note 2 below.

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S8	S7	S6	S5	S4	S3	S2	S1	SELECTION
ON								Encrypted communication required See note 2 below.

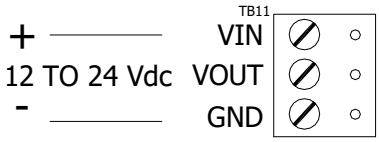
Note 1: Firmware revisions prior to 1.30.1, this setting is 2,400 BPS.

Note 2: Firmware revisions prior to 1.30.1, SW8 is not defined. Set to the OFF position.

Board Installation and Power

A qualified service person, complying with all applicable codes, should perform all required hardware installation. For UL installations, install the unit in accordance with National Electrical Code NFPA 70. If installing in Canada, install the unit according to Part 1 of the Canadian Electrical code CSA C22.1. For UL installations, install the board in a UL 294/1076 listed enclosure. It is recommended that the MR16OUT be mounted 0.50" above any conductive surface. The MR16OUT accepts 12 to 24Vdc for power. The power source must be filtered. Locate the power source as close to the unit as possible. Connect power with a minimum of 18AWG wire. Keep a minimum of ¼" spacing between power limited outputs and non-power limited wiring. **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 the 12-24Vdc input.** The VOUT terminal on TB11 is the same as VIN.

UL Note: The MR16OUT module has been evaluated for use with the LifeSafety Power FPO75, FPO150, and FPO250 power supplies or any UL Listed Power Supply evaluated to UL 603 (Power Supplies for use with Burglar Alarm Systems). It must be a UL Class 2 power supply of suitable ratings, with a minimum of 4 hours of standby power.



Cable Routing and Connection

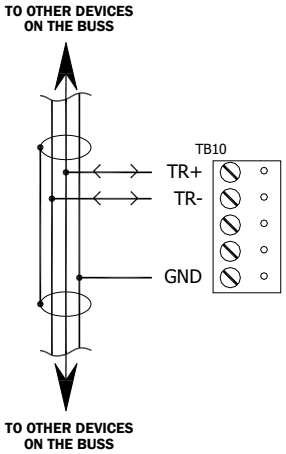
All low level input cables (reader cables, sensor input cables, controller communication cables, etc.) should be shielded and should preferably be run in grounded conduit or be run at least two feet from AC power, fluorescent lights, or other high energy sources. If conduit is used, do not run data cables in the same conduit as power cables.

Communication Wiring (SIO Communication Port):

The MR16OUT communicates to a Mercury Security intelligent controller (LP2500 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). Use shielded twisted pair cable (minimum 24 AWG) with a drain wire and a characteristic impedance of 120 ohm. See specifications section. The last device on each end of the communication line should have the terminator installed (install jumper J1).

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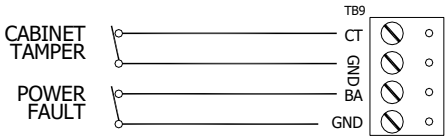
2-WIRE RS-485

(ONLY 2-WIRE RS-485 IS SUPPORTED)

Cabinet Tamper and UPS Fault Input Wiring:

Inputs CT and BA are used for monitoring cabinet tamper and power failure, respectively, with normally closed contacts. These two inputs are for contact closure monitoring only and do not use EOL resistor(s). If these inputs are not used, install a short piece of wire at the input to indicate a safe condition.

For UL Applications a listed UL 634 Tamper Switch must be employed to monitor the door of the enclosure containing the MR16OUT. Wire the tamper switch to the tamper input of the MR16OUT.



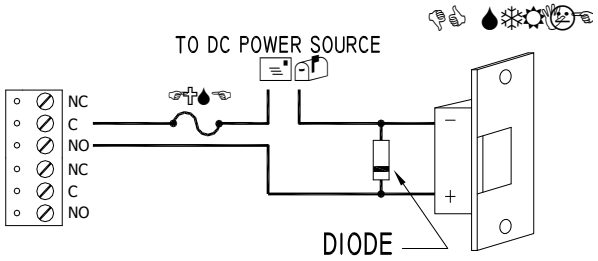
Relay Circuit Wiring:

Sixteen Form-C contact relays are provided for controlling door strikes or other devices. Each relay has a Common pole (C), a Normally Open pole (NO), and a Normally Closed pole (NC). When controlling the delivery of power to a door strike, the Normally Open and Common poles are typically used. When momentarily removing power to unlock the door, as with a mag lock, the Normally Closed and Common poles are typically used. Check with local building codes for proper egress door installation.

Door lock mechanisms can generate electromagnetic feedback to the relay circuit that can cause damage and premature failure of the relay and affect the operation of the MR16OUT. For this reason, it is recommended that either a diode be used to protect the relay when DC power for the lock or an MOV (metal oxide varistor) be used when using AC power for the lock. 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. Wire should be of sufficient gauge to avoid voltage loss.

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DIODE SELECTION:

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

UL Note: Door strike wiring has only been evaluated for DC strikes. AC strike wiring has not been evaluated by UL. The DC Source must be a UL Listed Power Supply evaluated to UL 603 (Power Supplies for use with Burglar –Alarm Systems). It must be a power limited power supply of suitable ratings, with a minimum of 4 hours of standby power. The relay shall be wired to enforce fail safe operation.

Status LEDs:

Power-up: All LED's OFF

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

When initialization is completed, LEDs A, B, CT, and BA are briefly sequenced **ON** then **OFF**.

Run time: After the above sequence, the LEDs have the following meanings:

A LED: Heartbeat and On-Line Status:
Off-line: 1 sec rate, 20% **ON**
On-line:
Non-encrypted communication: 1 sec rate, 80% **ON**
Encrypted communication:
.1 sec **ON**, .1 sec **OFF**, .1 sec **ON**, .1 sec **OFF**, .1 sec **ON**, .1 sec **OFF**, .1 sec **ON**, .3 sec **OFF**

A LED Error Indication:
Waiting for application firmware to be downloaded: .1 sec **ON**, .1 sec **OFF**.

B LED: SIO Communication Port Status:
Indicates communication activity on the SIO communication port

CT: Cabinet Tamper
BA: Power Fault

LED 1 through **16:** Illuminates when output relay OUT 1 (K1), OUT 2 (K2) is energized and so on.

Specifications:

Revision D assembly:

The MR16out is for use in low voltage, class 2 circuits only.

Primary power: 12 to 24 Vdc ± 10%, 1100 mA maximum

Relay contacts: Sixteen Form-C:

Normally open

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	contact (NO) contact: 5 A @ 30 Vdc resistive Normally closed contact (NC) contact: 3 A @ 30 Vdc resistive
Inputs:	2 unsupervised, dedicated for cabinet tamper and UPS fault monitoring
Communication:	RS-485, 2-wire. 9600, 19200, 38400, or 115200 bps
Cable requirements:	
Power:	1 twisted pair, 18 AWG
RS-485:	24AWG, 120 ohm impedance, twisted pair with drain wire and shield, 4,000' (1,200 m) maximum
Inputs:	1 twisted pair, 30 ohms maximum
Outputs:	As required for the load

Mechanical:

Dimension:	6" (152 mm)W x 8" (203 mm)L x 1" (25.4 mm)H
Weight:	14 oz. (400 gm) nominal

Environmental:

Temperature:	-55°C to +85°C, storage
	0°C to +70°C, operating
Humidity:	5% to 95% RHNC

UL294, 6th edition Performance Levels:

Feature	Level
Standby Power	I
Endurance	IV
Line Security	I
Destructive Attack	I

Warranty

AccessNsite warrants the product is free from defects in material and workmanship under normal use and service with proper maintenance for one year (30 days for repaired or replaced products) from the date of shipment. AccessNsite assumes no responsibility for products damaged by improper handling or installation. This warranty is limited to the repair or replacement of the defective unit. Returns must be accompanied by a Return Material Authorization (RMA) number obtained from customer service, and prepaid postage and insurance. AccessNsite's obligation under this warranty shall not arise until Buyer returns the defective product to AccessNsite's facility or another specified location.

There are no expressed warranties other than set forth herein. AccessNsite 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.

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. AccessNsite is not liable under any circumstances for loss or damage caused by or partially caused by the misapplication or malfunction of the product. AccessNsite's liability does not extend beyond the purchase price of the product.

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