HID® Mercury™ MR16in-S3 Processor
Installation and Specifications

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Contacts

For technical support, please visit: **https://support.hidglobal.com**.

What's new

Date	Description	Revision
August 2022	New branding.	A.1

A complete list of revisions is available in **Revision history**.

Section **01**
Overview

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1.1 MR16in processor

The MR16in processor provides a solution to the OEM system integrator for sensor monitoring and output control.

The MR16in has sixteen non-supervised/supervised inputs and two Form-C contact relays for load switching. In addition, two digital inputs are used for cabinet tamper and power fault status monitoring.

The MR16in processor requires 12 to 24 V DC for power.
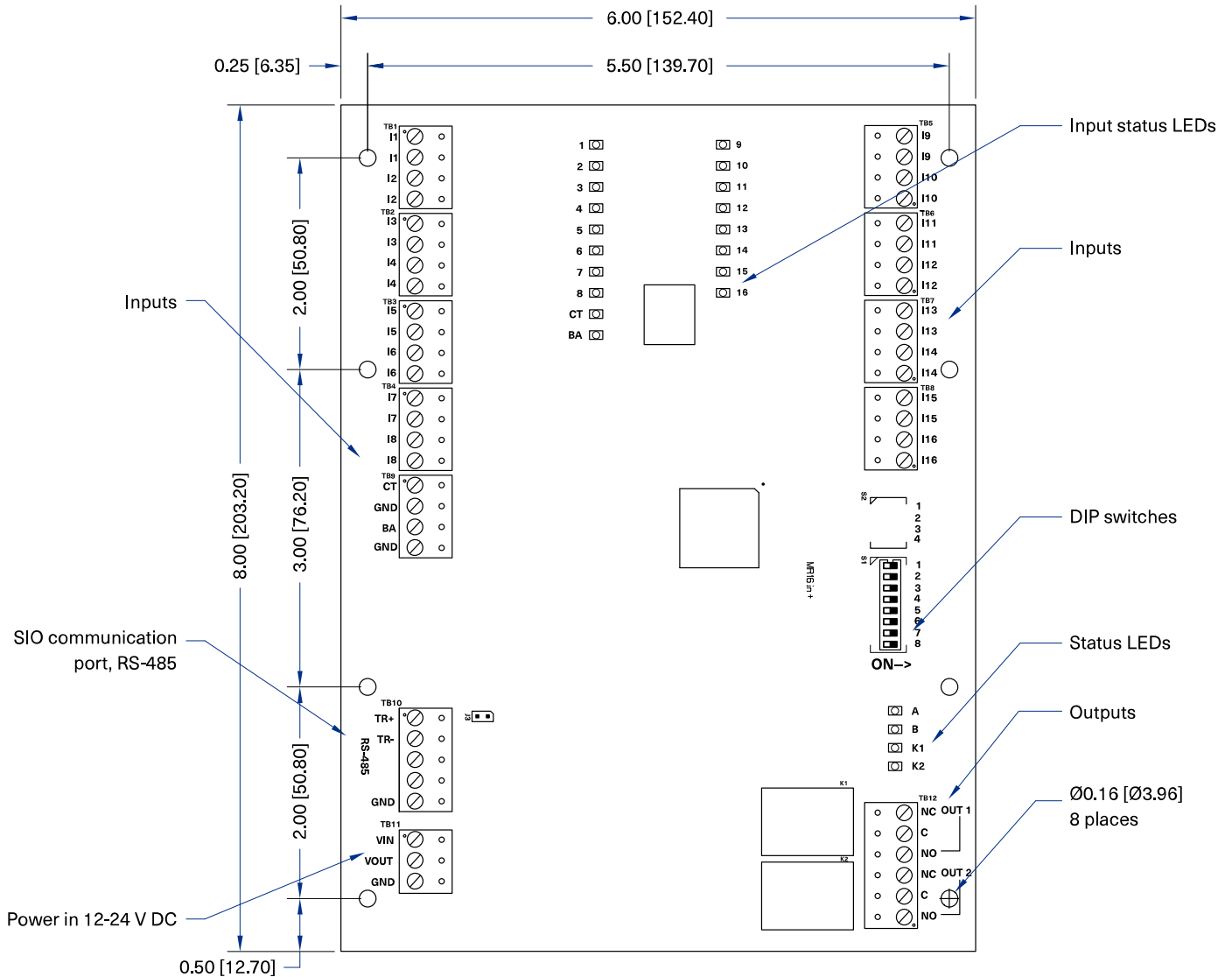
Section **02**
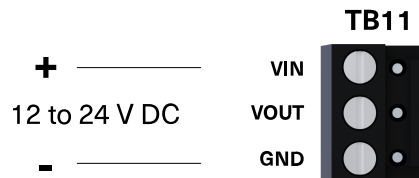
MR16in wiring and setup

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2.1 Supplying power to the MR16in

The MR16in accepts 12 to 24V DC for power. Locate power source as close to the unit as possible.

Connect power with minimum of 18 AWG wire.

Observe POLARITY on VIN!

The VOUT terminal on TB11 is the same as VIN.

TB11

+

12 to 24 V DC

−

VIN
VOUT
GND

2.2 Communication wiring

The MR16in communicates with an intelligent controller (EP2500 for example) via a 2-wire RS-485 interface. The interface allows multi-drop communication on a single bus of up to 4,000 feet (1,200 m). Shielded cable of 24 AWG with characteristic impedance of 120Ω is specified for the RS-485 interface. See **Specifications**.

Install RS-485 termination jumper, J3, on the interface boards at each end of the communication line only.

2-wire RS-485
(only 2-wire RS-485 is supported)

To other devices
on the buss

TB10

TR+
TR−

GND

To other devices
on the buss
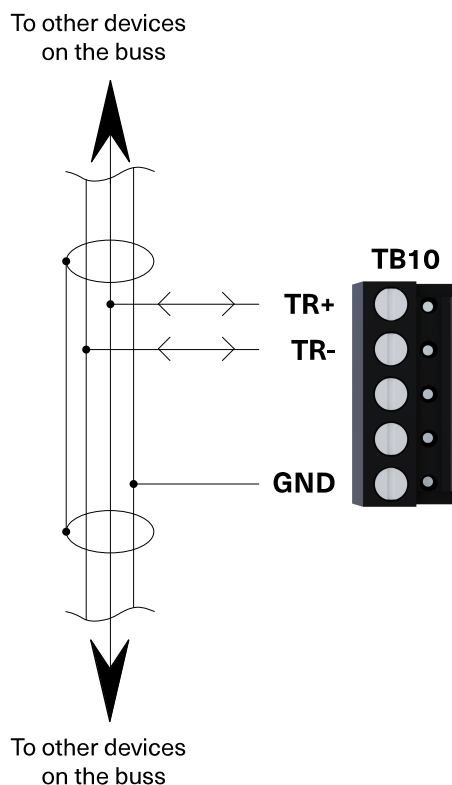
2.3 Alarm inputs wiring

Inputs 1 to 16 may be configured to use or not use End Of Line (EOL) resistors, and to use normally open or normally closed contacts.

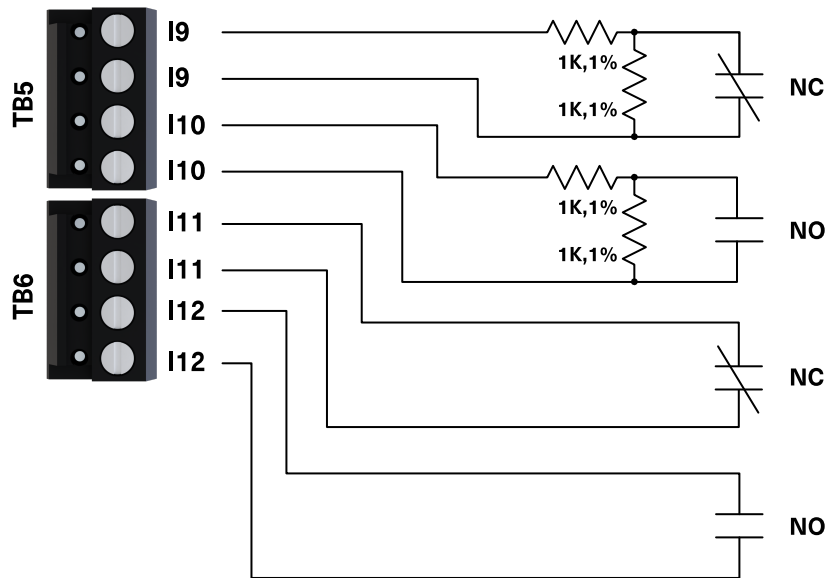Input CT and input BA are used for monitoring cabinet tamper and power failure, respectively. These two inputs are for contact closure monitoring only, and do not use EOL resistor(s).

Input configuration is set via host software.

2.4 Relay outputs

Two Form-C contact relays are provided for controlling door strikes or other devices. 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 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 further away.

Use sufficiently large gauge of wire for the load current to avoid excessive voltage drop.
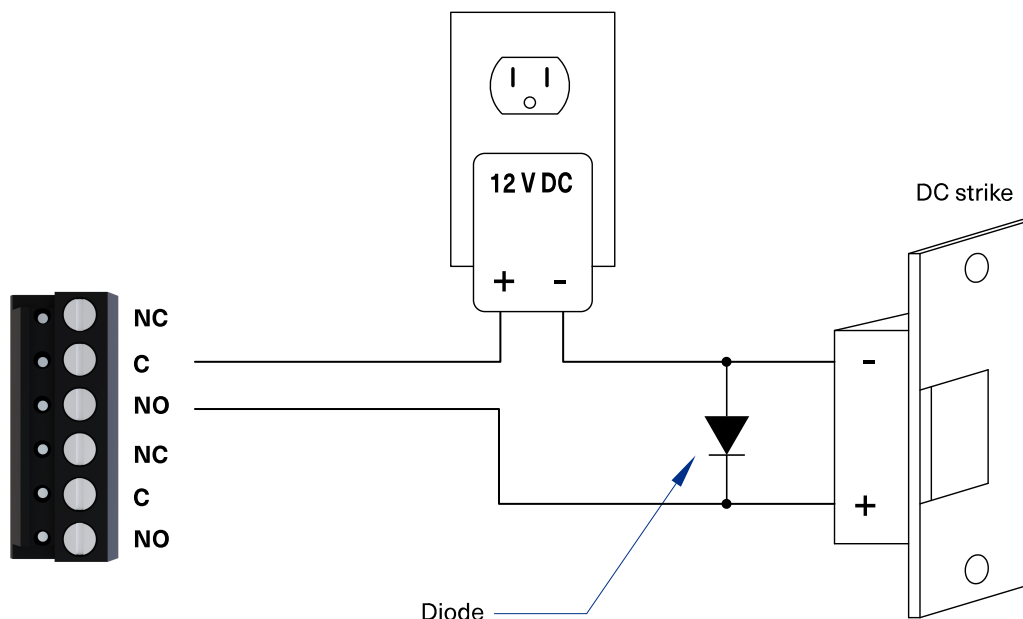
Diode selection

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

2.5 DIP switch and jumper usage

- 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

S8	S7	S6	S5	S4	S3	S2	S1	Selection
			ON	ON	ON	ON	OFF	Address 30
			ON	ON	ON	ON	ON	Address 31
	OFF	OFF						115,200 BPS[1]
	OFF	ON						9,600 BPS
	ON	OFF						19,200 BPS
	ON	ON						38,400 BPS
OFF								Encrypted communication not required[2]
ON								Encrypted communication required[2]

1. Firmware revisions prior to 1.30.1, this setting is 2,400 BPS.
2. Firmware revisions prior to 1.30.1, S8 is not defined. Set to the OFF position.

2.5.1 Jumpers

Jumper	Description
J3	RS-485 termination, install in first and last units only.

Note: All other jumpers are for factory use only.

2.6 Status LEDs

2.6.1 Power-up

All LEDs are OFF.

2.6.2 Initialization

Once power is applied, initialization of the module begins.

When initialization is completed, LEDs 1 through 16, CT, BA, A and B are briefly sequenced ON then OFF.

2.6.3 Run time

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

LED	Description	
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.	
1 LED	Input status: 1	
2 LED	Input status: 2	
3 LED	Input status: 3	
4 LED	Input status: 4	
5 LED	Input status: 5	
6 LED	Input status: 6	
7 LED	Input status: 7	
8 LED	Input status: 8	
9 LED	Input status: 9	
10 LED	Input status: 10	
11 LED	Input status: 11	
12 LED	Input status: 12	
13 LED	Input status: 13	
14 LED	Input status: 14	
15 LED	Input status: 15	
16 LED	Input status: 16	
CT	Cabinet tamper	

BA	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 fault state: Rapid Flash.
LED K1 and K2	Illuminates when output relay RLY 1 (K1) or RLY 2 (K2) is energized.

Section 03
Specifications

Revision E assembly:

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

Primary power	12 to 24 V DC ± 10%, 350 mA maximum
Outputs	**Two Form-C relays**
	Normally open contact (NO) contact: 5 A @ 30 V DC resistive
	Normally closed contact (NC) contact: 3 A @ 30 V DC resistive
Inputs	16 unsupervised/supervised, standard EOL: 1k/1kΩ, 1%, ¼ watt
	2 unsupervised, dedicated for cabinet tamper and UPS fault monitoring
Communication	RS-485, 2-wire. 9600, 19200, 38400, or 115200 bps
	CABLE REQUIREMENTS
Power	18 AWG, 1 twisted pair
RS-485	24 AWG, 120Ω impedance, twisted pair with drain wire and shield, 4,000 feet (1,200 m) maximum
Alarm inputs	1 twisted pair, 30Ω maximum
Outputs	As required for the load
	MECHANICAL
Dimension	6 inches (152 mm) W x 8 inches (203 mm) L x 1 inches (25.4 mm) H
Weight	9 oz. (250 g) nominal
	ENVIRONMENTAL
Storage temperature	-55°C to +85°C
Operating temperature	0°C to +70°C
Humidity	5% to 95% RHNC

UL294, 6th edition Performance Levels

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

These specifications are subject to change without notice.

3.1 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.

3.2 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.

3.3 Regulatory

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.

Revision history

Date	Description	Revision
August 2022	New branding.	A.1
October 2020	Initial release.	A.0

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