OPERATING INSTRUCTIONS

IRB-MON

UNIVERSAL SAFETY PHOTOEYE

UL325-2018 MONITORED DEVICE

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Cautions and Warnings

1. ***Read and follow all operating and Installation instructions.***
2. ***Always follow gate operator manufacturer installation instructions regarding installation of TYPE B1 sensor to the operator.***
3. ***Disable the gate so it is unable to move.***

Refer servicing to qualified service personnel.

IMPORTANT:
This product is an accessory or part of a system. Always read and follow the manufacturer's instructions for the equipment before connecting this product. Comply with all applicable codes and safety regulations. Failure to do so may result in damage, injury or death.

Product Overview

The IRB-MON is a thru-beam photo eye and is an external entrapment protection device type B1, non-contact sensor for use with automatic gates and doors. The light beam is near infrared and pulses at a rate of 300/second (300Hz). The IRB-MON provides a signal to the gate or door operator that the beam is not obstructed. The operating range is up to 115ft. The IRB-MON operates over a wide range of 6-35VDC and 12-24VAC.
A green alignment indicator on the receiver provides status information at a glance, making set-up and alignment easy.

The IRB-MON includes 3 selectable operating configurations providing compatibility with most operators that accommodate monitored external entrapment protection devices per UL325-2018.

REFER to operator installation instructions for proper configuration selection.

- **CONFIGURATION 0 - NON-MONITORED and MONITORED**

  Intended for use with operators that require simple relay contact activation to indicate beam obstruction. Reference Light ON/Dark ON setting. Jumper available for compatibility with Normally Open 10K termination operators.

- **CONFIGURATION 1 – MONITORED, HEARTBEAT 300Hz / 0Hz**

  Intended for use with operators designed to accept a "heartbeat" form of monitoring, 300Hz when aligned, no obstruction, 0Hz when beam is obstructed.

- **CONFIGURATION 2 – MONITORED, HEARTBEAT 300Hz / 2Hz / 0Hz**

  Intended for use with operators designed to accept a "heartbeat" form of monitoring, 300Hz when aligned, no obstruction, 2Hz when beam is obstructed, and 0Hz for a failure.

Specifications

Specifications	
Operating range	Up to 115 ft. (35m)
Detection angle	24°
Sensitivity adjustment	potentiometer
Power indicator	Green LED
Detect indicator	Flashing green LED
Mode selection switch	3 modes: relay output, pulsed (3 frequency), pulsed (2 frequency
Relay output operation	Light ON/dark ON
Relay output	Form C contacts (NO, COM, NC)
Power protection	Thermal fuse
Transmitter power cycle	>300mS (for use in configuration 0 Monitored)
Power (see Cautions and Warnings)	6...35VDC, 12...24VAC (Configuration 0 RELAY only)
Current (Config. 0)	60mA (relay activated)
Current (Config 1 & 2)	15mA (12VDC, includes TX and RX wired in parallel)
Operating temperature	-40°...170°F (-40°...77°C)
Environmental	NEMA 4X
Dimensions (L x W x H)	2.3" (57mm) x 2.6" (65mm) x 3.7mm (94mm)
Weight	TX – 0.35 lbs (159g), RX - 0.35 lbs (159g),
Connections	TX – 2 terminals, RX – 5 terminals

Configuration settings and indicators

CONFIGURATION SETTINGS - Remove power when changing configuration settings					
SW4	**SW3**	**SW2**	**SW1**	**JUMPER**	**FUNCTION**
ON	**OFF**	**OFF**	**OFF**	**NC**	Configuration 0 - relay operation
ON	**OFF**	**OFF**	**OFF**	**10K**	Configuration 0 – Install jumper for 10K resistive termination
OFF	**OFF**	**OFF**	**ON**	**NC**	Configuration 1 - heartbeat output, 300Hz, 0Hz, no relay activation
OFF	**OFF**	**ON**	**OFF**	**NC**	Configuration 2 - heartbeat output, 300Hz, 2Hz, no relay activation
ON	**OFF**	**ON**	**ON**	**NC**	Configuration 0 - relay operation
ON	**X**	**X**	**X**	**NC**	Dark on - N.O. contact closed when beam obstructed
OFF	**X**	**X**	**X**	**NC**	Light on – N.O. contact closed when beam is not obstructed

See the following pages for detailed descriptions, switch settings and wiring

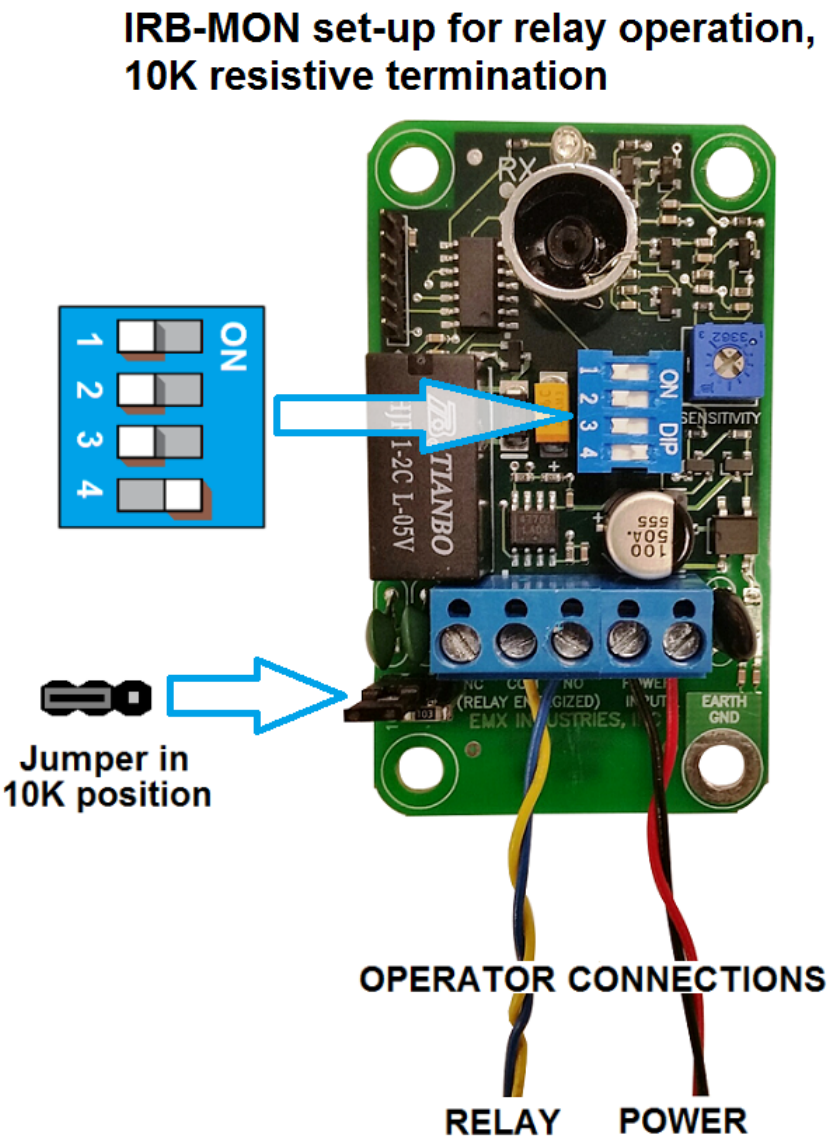
GREEN STATUS INDICATOR		
IRB-MON-T (transmitter)	ON	Power
IRB-MON-R (receiver)	Flashing	Blocked beam or not aligned
IRB-MON-R (receiver)	ON	Aligned
IRB-MON-R (receiver)	OFF	Receiver/Transmitter are too close See Troubleshooting Guide

RESISTIVE

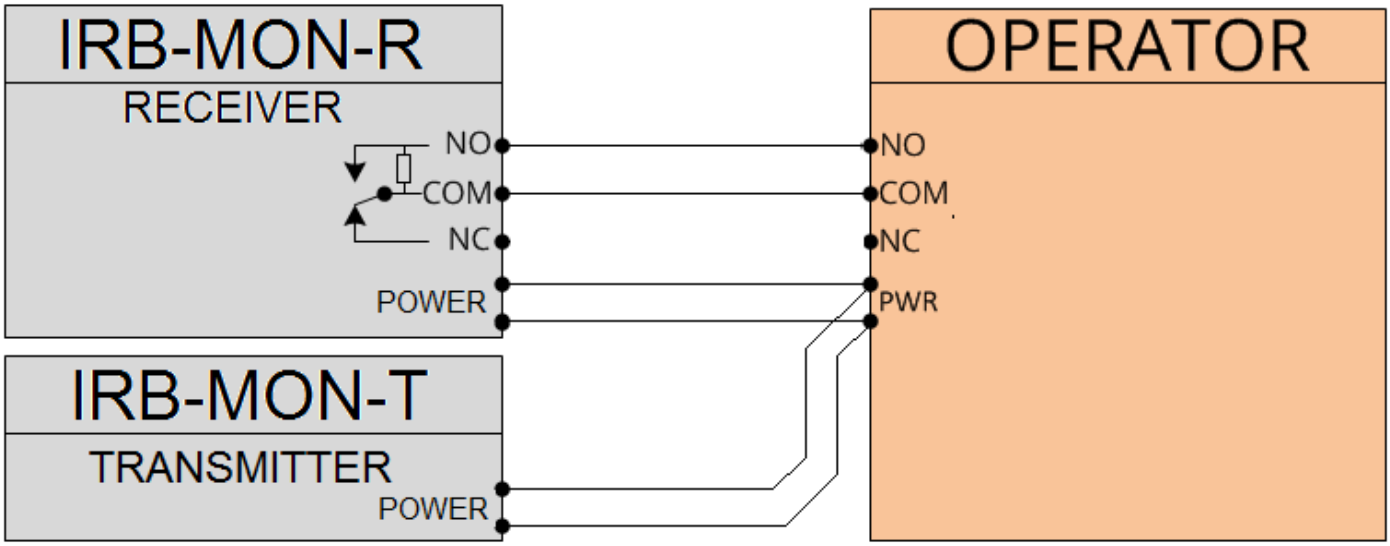
NOTE: Remove power when changing Configuration settings

MONITORING METHOD	SWITCH SETTINGS				OUTPUT CONNECTIONS	JUMPERS INSTALLED	REFERENCE WIRING DIAGRAM
	SW1	SW2	SW3	SW4		10K / NC	
RESISTIVE TERMINATION	OFF	OFF	OFF	ON	NO, COM	10K	A

NOTE: The relay contacts on the board and the references to them in these Instructions are shown in the energized state, no obstruction, Dark ON setting.



WIRING DIAGRAM A



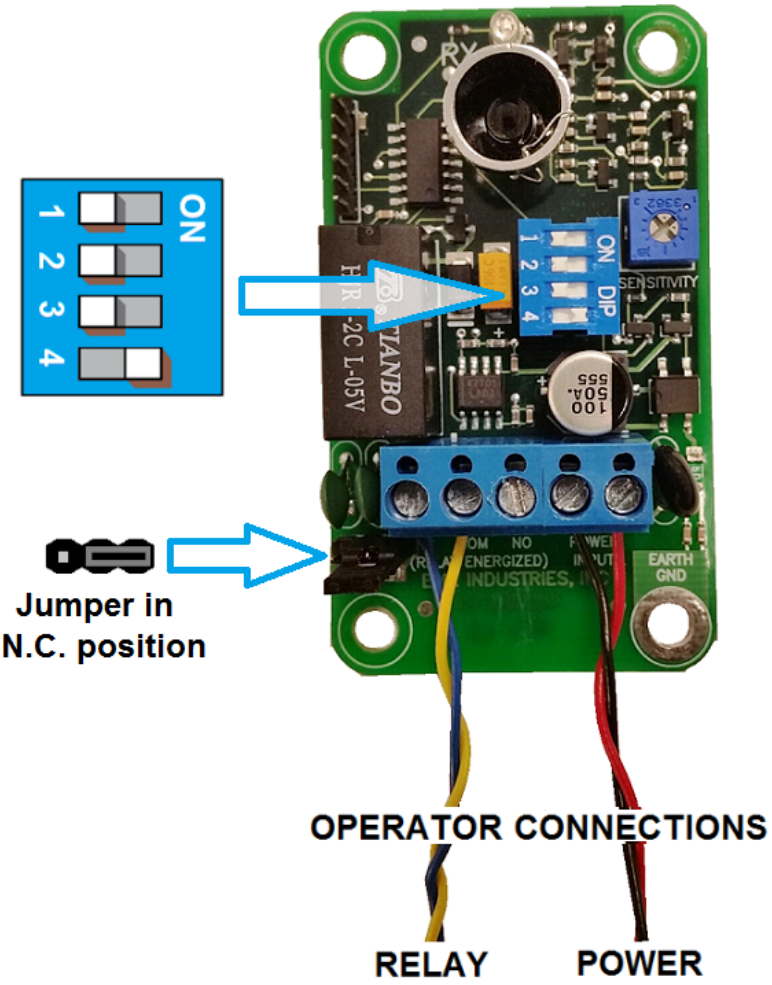
N.C.

NOTE: Remove power when changing Configuration settings

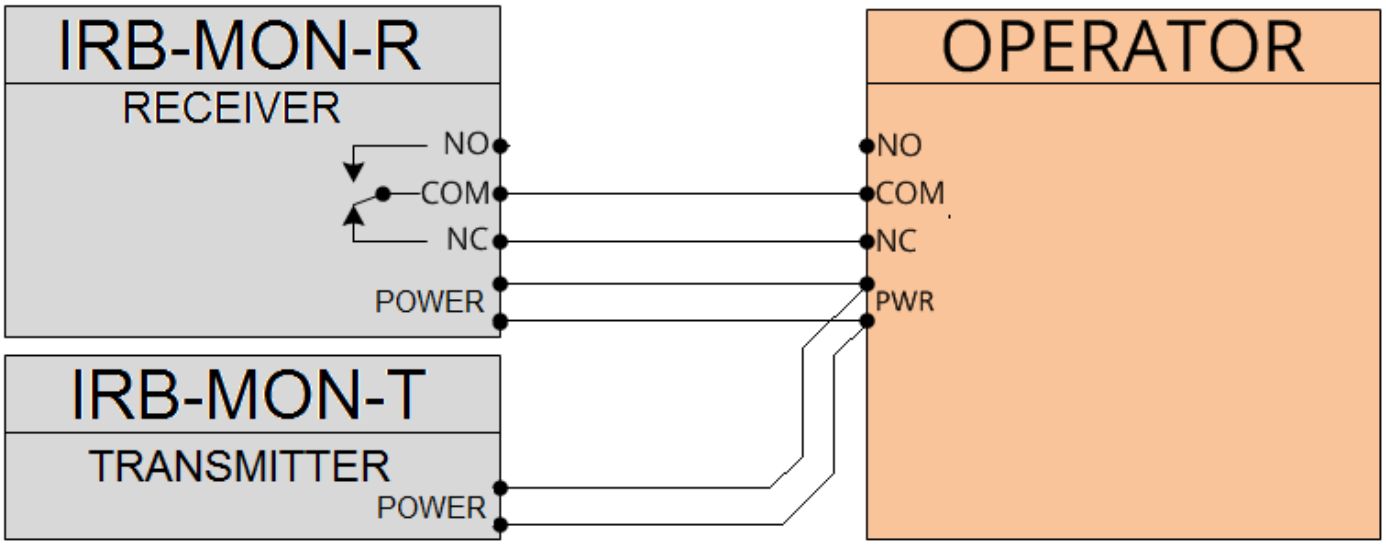
MONITORING METHOD	SWITCH SETTINGS				OUTPUT CONNECTIONS	JUMPERS INSTALLED	REFERENCE WIRING DIAGRAM
	SW1	SW2	SW3	SW4		10K / NC	
NORMALLY CLOSED: DARK ON (CONTACT CLOSED WHEN NOT OBSTRUCTED)	OFF	OFF	OFF	ON	NC, COM	NC	B

NOTE: The relay contacts on the board and the references to them in these Instructions are shown in the energized state, no obstruction, Dark ON setting.

IRB-MON set-up for relay operation, NC



WIRING DIAGRAM B

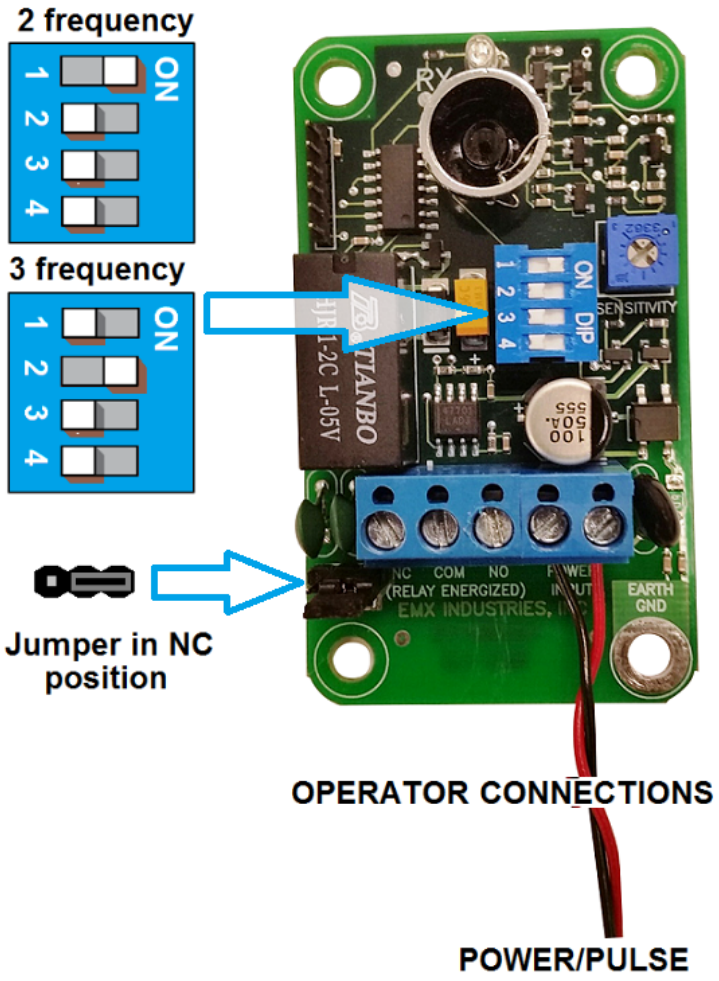


PULSE

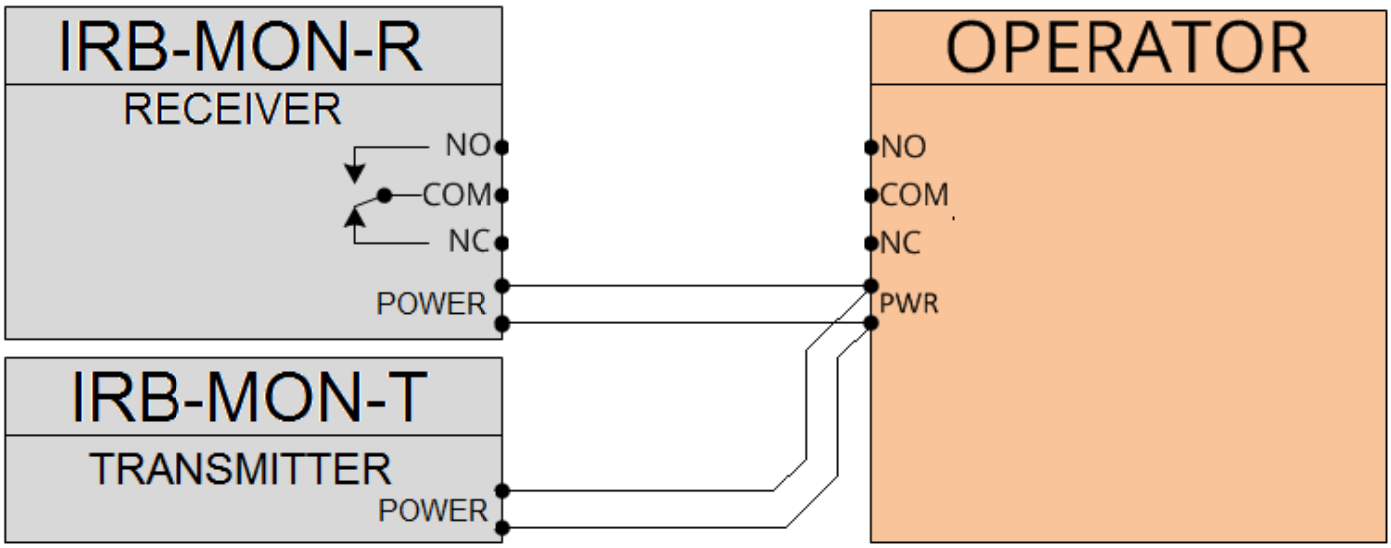
NOTE: Remove power when changing Configuration settings

MONITORING METHOD	SWITCH SETTINGS				OUTPUT CONNECTIONS	JUMPERS INSTALLED	REFERENCE WIRING DIAGRAM
	SW1	SW2	SW3	SW4		10K / NC	
TWO-WIRE PULSED (2 FREQUENCY)	ON	OFF	OFF	OFF	POWER	NC	C
TWO-WIRE PULSED (3 FREQUENCY)	OFF	ON	OFF	OFF	POWER	NC	C

IRB-MON set-up for pulse operation

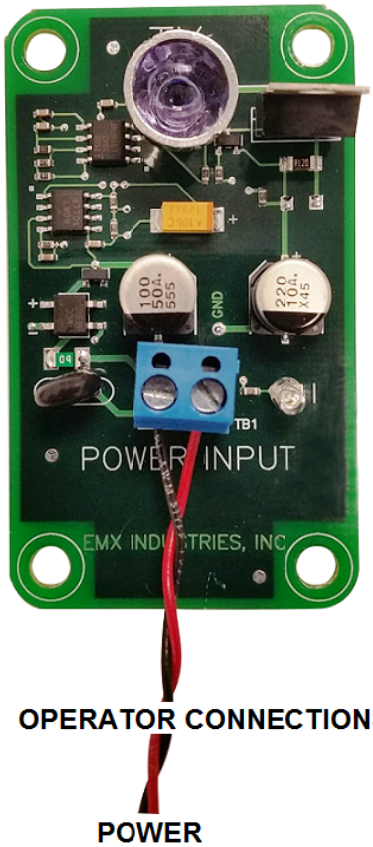


WIRING DIAGRAM C



TRANSMITTER WIRING

IRB-MON TRANSMITTER



Installation

Install the IRB-MON according to instructions from the gate operator manufacturer. The intent of External Entrapment Protection Device Type B1 non-contact sensor is to protect a person from being accidentally injured by the moving gate or door.

DO NOT USE 12-24VAC IN PULSE CONFIGURATIONS.

1. Disconnect the IRB-MON from power before installing or servicing the device.

2. Always follow the instructions of the gate operator manufacturer regarding installation of type B1 sensors on the gate operator. The instructions of the gate operator manufacturer always supersede any instructions given in this or any other instructions by EMX Industries Inc.

3. Connect the IRB-MON power supply per requirements indicated in the specification table.

4. When using the relay outputs, do not exceed the voltage/current ratings indicated in the specification table.

5. Connect power to the terminals on the transmitter marked “TX”, polarity is not required.

6. Connect power to terminals marked “POWER INPUT” on the receiver, marked “RX” polarity is not required.

7. **FOR CONFIGURATION 0 ONLY.** Operators that require normally closed contact for entrapment protection, connect terminal NC and COM to the designated terminals in the gate operator. Operators that require normally open contact for entrapment protection, connect terminals COM and NO to the designated terminals in the gate operator.

8. Install the IRB-MON according to instructions from the gate operator manufacturer. The intent of External Entrapment Protection Device Type B1 non-contact sensor is to protect a person from being accidentally injured by the moving gate or door.

9. The IRB-MON is housed in a NEMA 4X enclosure. To insure the integrity of the enclosure make sure the covers are attached and closed tight using all four plastic screws provided. The wiring to the enclosure must enter via UL Listed watertight fitting such as a strain relief or watertight conduit connector.

10. The IRB-MON must be powered by Class 2 circuits only, wiring must be segregated from other circuits or insulation must be provided that is suitable for the highest voltage for those circuits.

11. NOTE: REDUCE SENSITIVITY (COUNTER-CLOCKWISE) WHEN INSTALLING AT <20 FT.

Verification and operation

Verify proper operation of the IRB-MON according to instructions from the gate operator manufacturer. The intent of External Entrapment Protection Device Type B1 non-contact sensor is to protect a person from being accidentally injured by the moving gate or door.

1. Verify that the IRB-MON transmitter and receiver in line of sight and apply power.

2. Place an obstruction (ex. hand) between the IRB-MON transmitter and receiver. The green LED on the receiver is flashing. Check the operator control board that the safety input is actuated.

3. Remove the obstruction and green LED will be on.

4. If the IRB-MON does not respond to the obstruction, lower the sensitivity by adjusting the SENSITIVITY pot counter-clockwise.

5. If the IRB-MON indicates an obstruction when there is no obstruction, increase the sensitivity by adjusting the SENSITIVITY pot clockwise.

6. Follow gate/door manufacturer's installation instructions and safety checks to verify that the IRB-MON is operating properly.

Troubleshooting

Symptom	Possible cause	Solution
Does not detect obstruction of beam	**Sensitivity too high**	Adjust SENSITIVITY pot counter-clockwise
	Signal is reflecting off another surface	Check area for highly reflective surfaces
Green LED flashes continuously (indicating an obstruction when an obstruction is not present)	**Sensitivity too low**	Adjust SENSITIVITY pot clockwise
	Transmitter does not have power	Check power source for transmitter
	Receiver does not "see" transmitter	Make sure transmitter and receiver have line of sight alignment
Receiver activates but does not transmit signal to operator	**Faulty connection between receiver and operator control input**	Verify all wires and terminal connections
Receiver green LED off (1)	**Transmitter too close to receiver**	Adjust SENSITIVITY pot counter-clockwise Increase distance between transmitter and receiver

(1) When transmitter is too close to the receiver the green LED will turn off, this prevents mounting the photo eyes in close proximity.

Ordering Information

IRB-MON	**Infrared photocell includes transmitter and receiver**

Accessories

IRB-HD-SET	**Protective hood, aluminum, gold anodized**
IRB-SD-SET	**Protective hood, steel, gray powder-coat**
IRB-BR	**Mounting bracket, "L" shape**
IRB-SP	**Strain relief, water-tight**
IRB-S	**Nylon screws, set of 2 with nuts**

Warranty

EMX Industries Incorporated warrants all products to be free of defects in materials and workmanship for a period of two years under normal use and service from the date of sale to our customer. This warranty does not cover normal wear and tear, abuse, misuse, overloading, altered products, damage caused by incorrect connections, lightning damage, or use other than intended design.

There is no warranty of merchantability. There are no warranties expressed or implied or any affirmation of fact or representation except as set forth herein.

EMX Industries Inc. sole responsibility and liability, and the purchaser's exclusive remedy shall be limited to the repair or replacement at EMX Industries option of a part or parts found not conforming to the warranty. In no event shall EMX Industries Inc. be liable for damages, including but not limited to damages resulting from non-conformity, defect in material or workmanship.

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