



## Instruction Manual

The IRB-MON thru beam infrared photoeye is an external entrapment protection device type B1, non-contact sensor for use with automatic gates and doors. The photoeye provides a signal to the gate or door operator that the beam is or is not obstructed. The IRB-MON operates up to 115 feet over a wide range of voltages (6-35 VDC and 12-24 VAC). A green alignment indicator on the receiver provides status information at a glance, making set-up and alignment easy. The IRB-MON provides compatibility with most operators that accommodate monitored external entrapment devices per UL325.

### Cautions and Warnings



This product is an accessory or part of a system. Install the IRB-MON according to instructions from the gate or door operator manufacturer. Comply with all applicable codes and safety regulations.

### Specifications

Operating Range	Up to 115 ft (35 m)
Power	6-35 VDC, 12-24 VAC
Current (NC and 10K Monitoring Methods)	60 mA (relay activated)
Current (Pulse Monitoring Methods)	15 mA
Surge Protection	Thermal fuse
Relay Output Operation	Light ON/Dark ON
Relay Output Configuration	Form C contacts (NO, COM, NC)
Transmitter Power Cycle	<300 mS (for use in NC or 10K monitoring)
Operating Temperature	-40° to 170°F (-40° to 77°C)
Dimensions (L x W x H)	2.3" (57 mm) x 2.6" (65 mm) x 3.7" (94 mm)
Environmental Rating	NEMA 4X

## Ordering Information

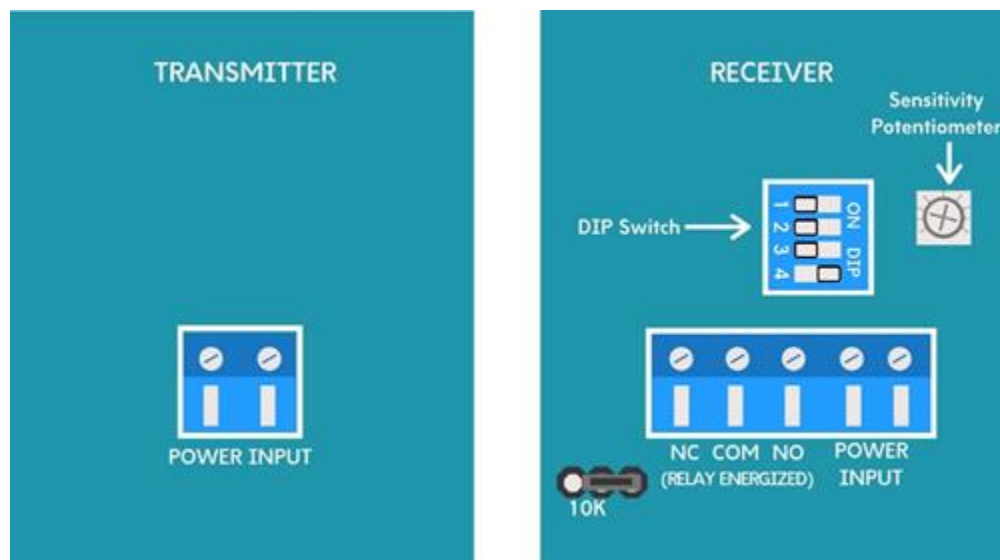
- IRB-MON Thru beam photoeye, includes transmitter, receiver and sunshield
- IRB-HD-SET Gold anodized aluminum protective hoods
- IRB-SH-SET Gray powder-coated steel protective hoods
- IRB-SP Nylon liquid tight strain relief connector, set of two
- IRB-S Nylon mounting screws with nuts, set of two
- IRB-BR Steel "L" shaped mounting bracket, set of two
- IRB- RX-SH Receiver sunshield

## Monitoring Methods

**UL325 requires continuous monitoring of all safety devices connected to gate and door operators. Consult the gate or door operator manufacturer's instruction manual for necessary monitoring method.**

- **Normally Closed:** Cycles power to the transmitter while monitoring the receiver contacts for proper operation
- **10K Resistive Termination:** Provides a measurable 10K ohm resistance across the normally open (NO) when unobstructed
- **Two-wire Pulse (2 Frequency):** Provides 300Hz "heartbeat" unobstructed, 0Hz obstructed over power supply lines
- **Two-wire Pulse (3 Frequency):** Provides 300Hz "heartbeat" unobstructed, 2Hz obstructed, and 0Hz failure over power supply lines

## Board Diagram



## Installation

- Determine the mounting location of the IRB-MON photoeye according to UL325 guidelines.
- Deactivate the gate or door during photoeye installation.
- **The IRB-MON cannot be used for a detection range of less than 5 feet.**

1. Check the instruction manual of the gate or door operator to determine which monitoring method is necessary for that specific operator.

2. Knock out the PG hole on the housing that will be used to wire through. Be careful not to damage electronic circuit board when knocking out the hole.

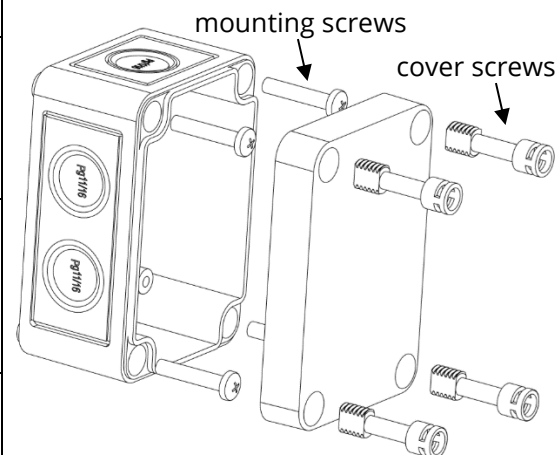
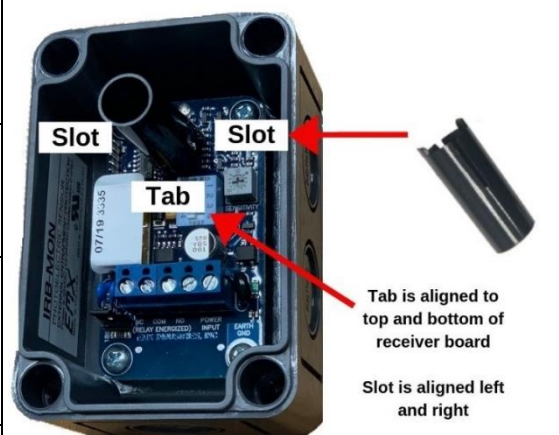
3. Connect 6-35 VDC or 12-24 VAC power to the "Power Input" terminals on the transmitter (marked "TX") and receiver (marked "RX".) The power input terminals are not polarity sensitive.

4. Install optional sunshield on receiver as shown to the right to reduce the effects of solar interference or cross talk.

5. Wire the IRB-MON according to the configuration table and wiring diagram that corresponds with the monitoring method required by the gate or door operator.  
**MUST USE 6-35 VDC FOR PULSE MONITORING.**

6. Make sure the covers are attached and closed tight using all four plastic screws provided as shown. The wiring to the enclosure must enter via UL listed watertight fitting such as a strain relief or watertight conduit connector.

7. Verify that the IRB-MON transmitter and receiver are aligned and apply power.



LED Indicators	
Green transmitter LED on	Power
Green receiver LED on	Aligned
Green receiver LED flashing	Beam blocked or not aligned

8. The receiver and transmitter are aligned correctly when the green LED on the receiver is on. Decrease the sensitivity setting on the receiver to the position where the green LED on the receiver starts to flash. Then increase sensitivity setting one quarter turn. Confirm receiver LED is still on.

9. Place an obstruction (ex. hand) between the IRB-MON transmitter and receiver. The green LED on the receiver will flash. Check the operator control board and verify that the safety input is recognized by the operator. Test the beam with an obstruction between transmitter and receiver at multiple distances to confirm proper operation.

10. Remove the obstruction and the green LED will turn on.

**TIP:**

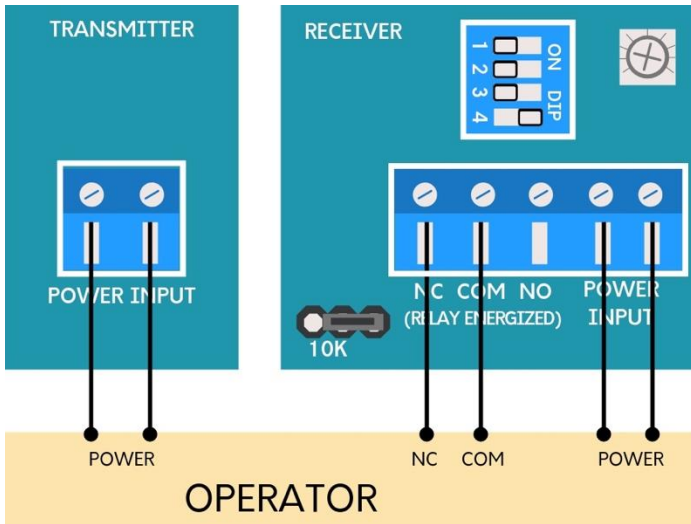
If the IRB-MON is aligned but not detecting an obstruction, consider slowly reducing sensitivity (counter-clockwise) on the receiver until the obstruction is detected. This may be applicable for installations with a detection zone of less than 20 ft.

## Configuration Settings and Wiring Diagrams

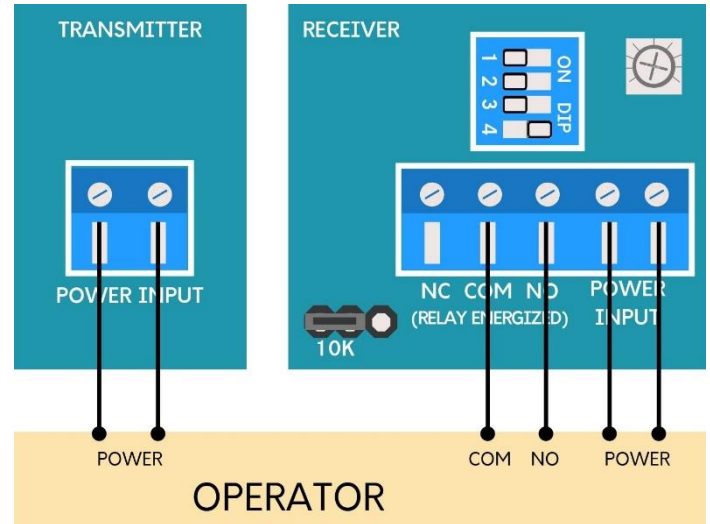
Monitoring Method	Wiring Diagram	DIP Switch Settings				Output Connections	Jumper
		SW1	SW2	SW3	SW4		
Normally Closed	A	OFF	OFF	OFF	ON	NC, COM	10K disabled
10K Resistive Termination	B	OFF	OFF	OFF	ON	NO, COM	10K enabled
Two-Wire Pulse (2 Frequency: 300Hz, 0Hz)	C	ON	OFF	OFF	ON	DC Power	10K disabled
Two-Wire Pulse (3 Frequency: 300Hz, 2Hz, 0Hz)	D	OFF	ON	OFF	ON	DC Power	10K disabled

- **Must use 6-35 VDC for pulse monitoring.**
- The relay contacts labeled on the terminals and the references to them in these instructions are shown in the energized state, no obstruction. (Dark ON setting – normally open (NO) contact closes when the beam is unobstructed.)
- Pulsed configurations require current limiting in the operator. The IRB-MON will pulse 300Hz when not obstructed and 0Hz when obstructed.
- **DIP Switch 4 should be ON in virtually every configuration scenario.** When DIP Switch 4 is ON the relay will change state during a loss of power. This is sometimes referred to as a “fail safe” mode. It is also sometimes referred to as Dark ON mode as the relay contact will be in the closed position when under power and NOT obstructed.
- Dip Switch 4 is OFF in very rare installation scenarios. When Dip Switch 4 is OFF, the relay will function in reverse. In addition, if DIP Switch 4 is OFF, during a loss of power the relay will NOT change state during a loss of power. This is sometimes referred to as “fail secure” mode. It is also sometimes referred to as Light ON (or Dark OFF) mode as the relay contact will be in the open position when under power and NOT obstructed. **WARNING: Leave DIP Switch 4 ON in all normal operations and all UL 325 monitoring scenarios.**

**Wiring Diagram A: Normally Closed**

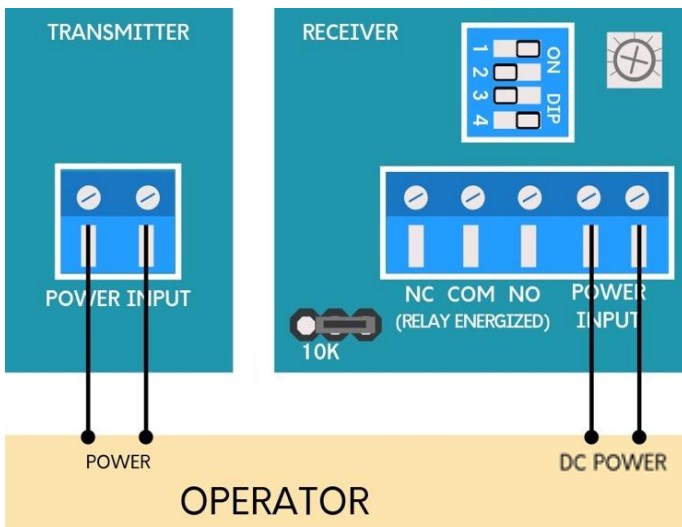


**Wiring Diagram B: 10K Resistive Termination\***

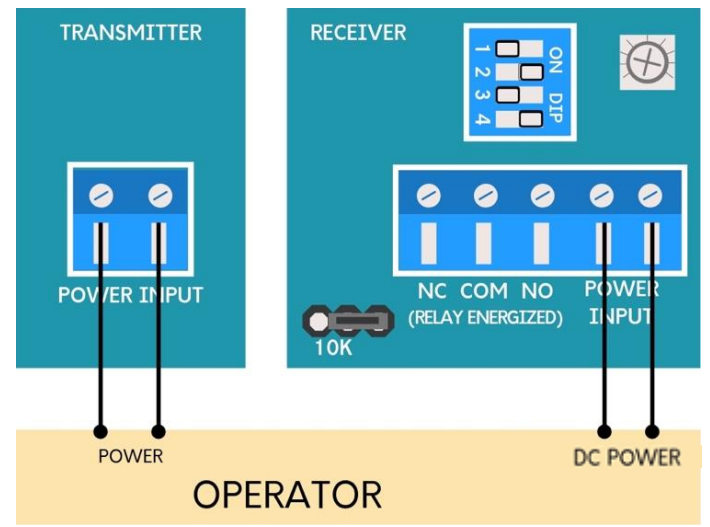


**\*If using the IRB-MON in an application that does not require UL325 monitoring across the normally open contact, it is possible to disable the 10K resistor by moving the 10K jumper to pins 2 and 3.**

**Wiring Diagram C: Two-Wire Pulse (2 Frequency)**



**Wiring Diagram D: Two-Wire Pulse (3 Frequency)**



## Troubleshooting

Symptom	Possible Cause	Solution
Does not detect obstruction	Sensitivity is too high  Signal is reflecting off another surface	Decrease sensitivity potentiometer counter-clockwise  Check area for highly reflective surfaces
Receiver green LED flashes continuously, indicating an obstruction when one is not present	Sensitivity is too low  Transmitter does not have power  Receiver does not "see" transmitter	Increase sensitivity potentiometer clockwise  Check power source of transmitter  Make sure transmitter and receiver are aligned
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	Transmitter too close to receiver	Decrease sensitivity potentiometer counter-clockwise  Increase distance between transmitter and receiver
Output relay chatters constantly between open and close	All 4 DIP switches are in the OFF position	Consult the <a href="#">Configuration Settings</a> table and set the DIP settings according to the UL325 monitoring method detailed by the gate or door operator manufacturer.

## Warranty

EMX Industries, Inc. products have a warranty against defects in materials and workmanship for a period of two years from date of sale to our customer.