



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 input 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	Monitored normally closed, or normally open
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

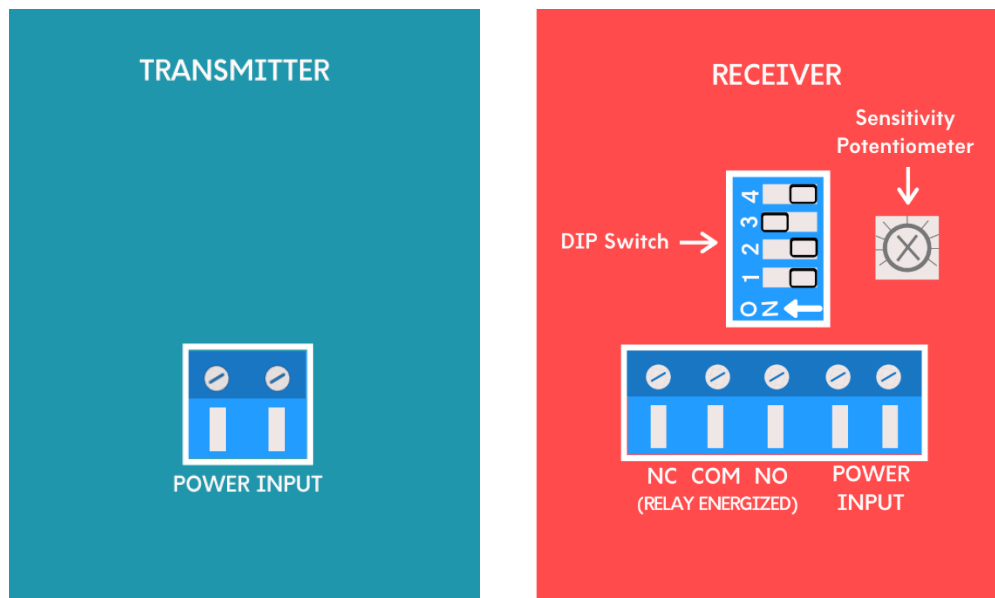
- IRB-MON KIT Thru beam photoeye kit, includes transmitter, receiver, protective hoods, and sunshield
- IRB-HD-SET Gold anodized aluminum protective hoods
- IRB-SH-SET Gray powder-coated steel protective hoods

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** (Wiring Diagram A): The operator cycles power to the transmitter while monitoring the receiver N.C. (Normally closed) contacts for proper operation
- **10K Resistive Termination** (Wiring Diagram B): Provides a measurable 10K ohm resistance across the N.O. (normally open) relay when unobstructed and in Fail Safe mode
- **Two-Wire Pulse, 2 Frequency** (Wiring Diagram C): Provides 300Hz "heartbeat" unobstructed, 0Hz obstructed over the receiver input power supply lines
- **Two-Wire Pulse, 3 Frequency** (Wiring Diagram D): Provides 300Hz "heartbeat" unobstructed, 2Hz obstructed, and 0Hz when failure is detected, over the receiver input power supply lines

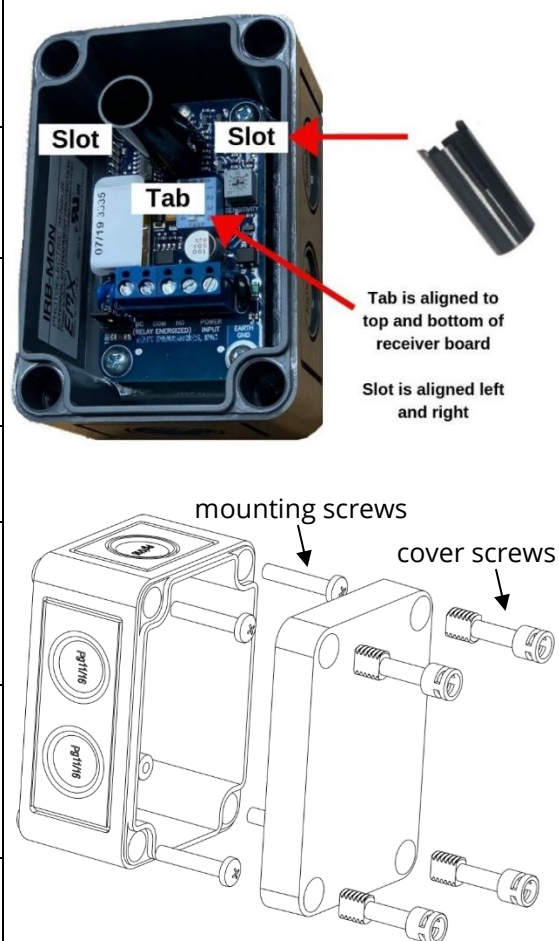
Board Diagram



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

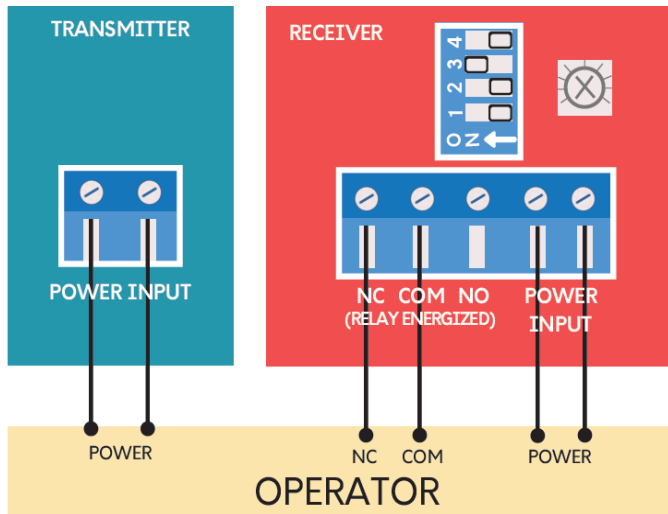
Monitoring Method	Wiring Diagram	DIP Switch Settings				Output Connections	10K State
		SW1	SW2	SW3	SW4		
Normally Closed	A	OFF	OFF	ON	OFF	NC, COM	10K DISABLED
10K Resistive Termination	B	OFF	OFF	ON	ON	NO, COM	10K ENABLED
Two-Wire Pulse (2 Frequency: 300Hz, 0Hz)	C	ON	OFF	OFF	OFF	DC POWER	N/A
Two-Wire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

- FAIL SAFE** (Wiring Diagram A or B) – **Most common monitoring method - Gate opens with loss of power** - DIP switches shown as in the table above for monitored “Normally Closed” and “10K Resistive Termination”. The relay will change state during a loss of power (N.C. will open, and N.O. will close). It is also sometimes referred to as Dark ON as the N.C. relay contact will be in the closed position and N.O. contact in the open position when under power and NOT obstructed (aligned).
WARNING: Use this mode in all normal operations and UL325 monitoring scenarios.
- FAIL SECURE** (Wiring Diagram A or B) – **Less common monitoring method, Gate closes/secures with loss of power** - To achieve Fail Secure for either “Normally Closed” or “10K resistive termination”, configure dipswitches the same as shown in the above table “EXCEPT” SW1 needs to be ON. Fail Secure is sometimes referred to as Light ON. The relay will function in reverse (opposite what is written on the PCB). When powered on and aligned the N.O. relay will be closed, and the N.C. contact will be open. The relay WILL NOT change states during loss of power so the gate stays closed during power loss (N.O. will close, and N.C. will open).
- Two-Wire Pulse Monitoring** (Wiring Diagram C or D) – **Must use 6-35 VDC (can’t use AC power in two-wire pulse mode)** and requires a compatible operator board with the current limiting resistor.

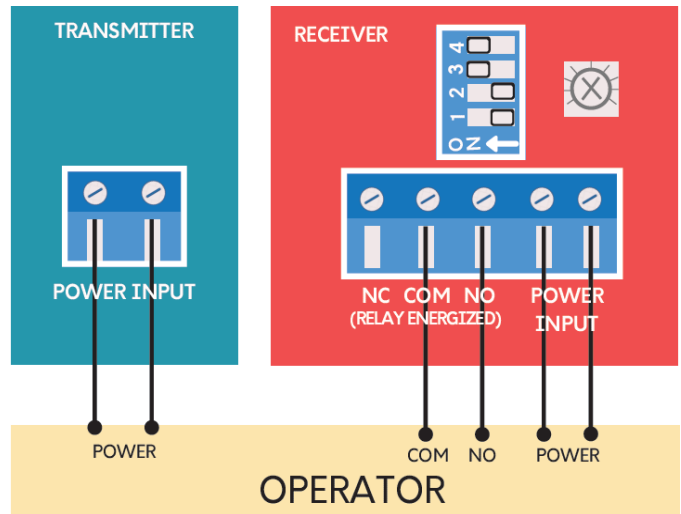
Note: If using the IRB-MON in an application that does not require UL325 monitoring across the normally open contact, it is possible to disable the 10K resistor by using Wiring Diagram A DIP switch setting, but connect to N.O. relay.

Wiring Diagrams

Wiring Diagram A:
Normally Closed

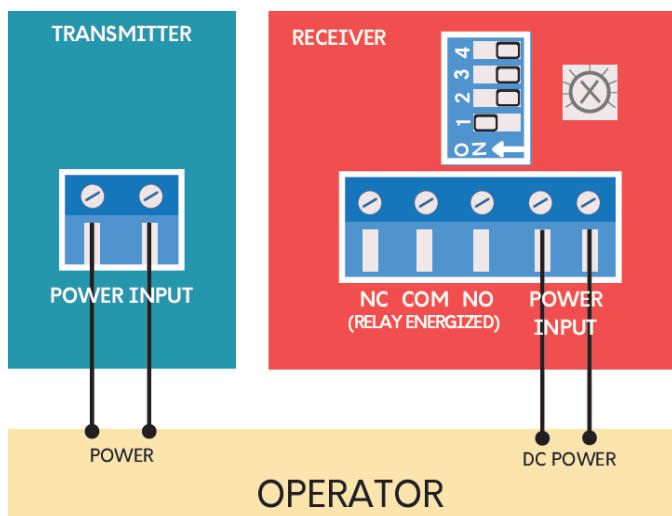


Wiring Diagram B:
10K Resistive Termination*

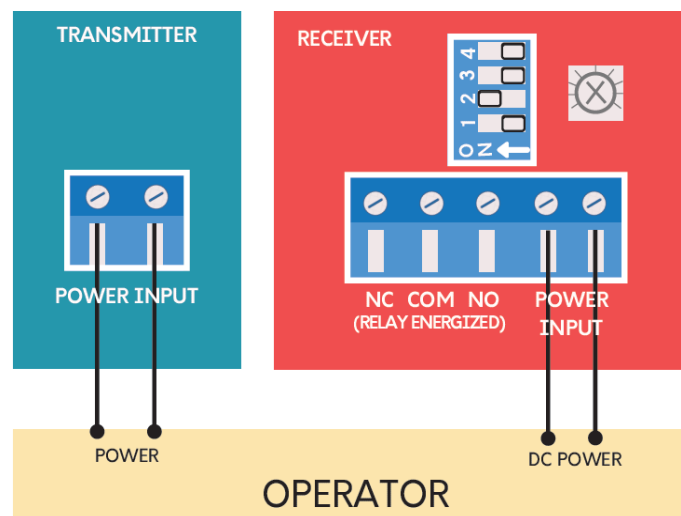


***If using the IRB-MON in an application that does not require UL325 monitoring across the normally open contact, it is possible to disable the 10K resistor by using Wiring Diagram A DIP switch setting, but connect to N.O. relay.**

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	Decrease sensitivity potentiometer counter-clockwise
	Signal is reflecting off another surface	Check area for highly reflective surfaces
Receiver green LED flashes continuously, indicating an obstruction when one is not present	Sensitivity is too low	Increase sensitivity potentiometer clockwise
	Transmitter does not have power	Check power source of transmitter
	Receiver does not "see" 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 Configuration Settings table and set the DIP switches 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.