

IR-50 / IR-150

Indoor Photo-Electric Infrared Beam Barrier



Installation Instructions

1. INTRODUCTION

IR-50 and IR-150 are pulse-modulated photoelectric infrared beam barrier designed for indoor residential, commercial and industrial applications. The system consists of a transmitter producing a wide angle (IR-50) or concentrated (IR-150) invisible infrared beam towards a narrow-angle receiver. Visible Beam Locator light in the receiver (IR-50) or in the transmitter and the receiver (IR-150), provide quick and easy alignment without special tools or test equipment.

The transmitted beam is generated by 2 powerful infrared LEDs. The 40° wide angle beam of IR-50 allows multiple receiver installations using a single transmitter. The 6° receiver field of view provides a large safety margin to prevent false alarms. Yet it is narrow enough to eliminate reception of reflected beam. Internal built-in optical filter prevents unwanted light penetration, other than the infrared wavelength.

The system is immune to fluorescent radiation, flickering lights and indirect sunlight.

State-of-the-art electronic circuitry provides protection against RF interference and supply voltage transients.

The transmitter emits an invisible beam, to the receiver. When an intruder crosses this beam barrier, the receiver's internal alarm relay deenergizes.

The receiver's walk test LED lights at the same time (when LED selector is in Walk position, see par. 3.4). After crossing, the relay again energizes and the LED extinguishes.



2. SPECIFICATIONS

FEATURE	IR-50	IR-150
OPTICAL		
Range (**)	Up to 50m (150 ft)	Up to 150m (500 ft)
Transmitter beam width	40° (*)	6° (*)
Receiver field of view	6°(*)	
Adjustment	Vertical +10° to 20°. Horizontal 30°.	
Beam Locators	Visible Beam Locator built into receiver and transmitter	
ELECTRICAL		
Voltage	9 - 16VDC (protected against reverse polarity)	
Transmitter current	20mA	15mA
Receiver current	15mA	
Relay output	Normally closed (fail-safe) contacts. 18 ohm resistor in series with contacts. Rating - 0.5A resistive/24 VDC.	
Alarm period	2 - 3 seconds	
Tamper contacts	Normally closed. Rating - 0.5A resistive/24 VDC.	
LED	Three selectable operation modes	

FEATURE	IR-50	IR-150
Infrared source	Long-life Gallium Arsenide LED	
Infrared sensor	PIN photodiode	
Transmitter Frequency	1 kHz, 10 microsecond pulse width	
IR wavelength	950 nm	
Receiver type (Qty.)	IRR-50 (one or multiple)	IRR-150 (one)
ENVIRONMENTAL		
Operating temperature	-10°C to 50°C (14°F to 122°F)	
Storage temperature	-20°C to 60°C (-4°F to 140°F)	
PHYSICAL		
Dimensions	120 x 70 x 48 mm (4.7 x 2.7 x 1.9 in)	
Weight	220 g (0.48 lb)	
Colors	Dark beige standard cream/ white also available	Dark beige or standard white

* Typical, horizontal and vertical. ** distance between transmitter to receiver

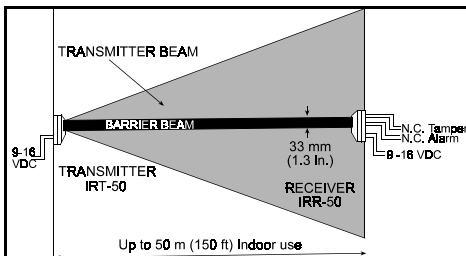


Figure 1A. IR-50 Side View Beam Pattern

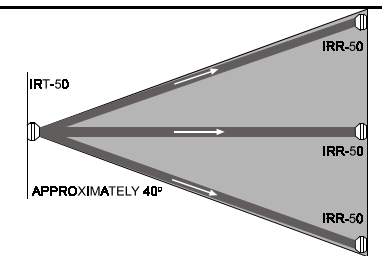


Figure 1B. IR-50 Top View - Multiple Receivers

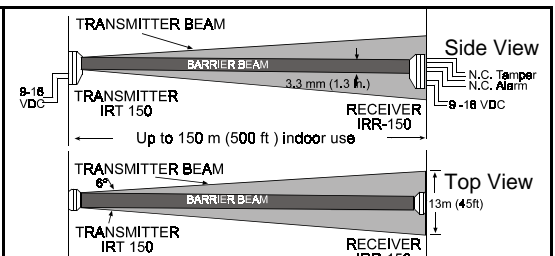


Figure 2. IR-150 View Beam Pattern

3. INSTALLATION

3.1 Selecting Mounting Location

- Select mounting locations / height for the transmitter and receiver(s) so that an intruder will cross the beam(s). The receiver and transmitter should be mounted facing each other, and their angular back housing allow installation directly onto a wall (surface mount), or in a corner. They may also be flush-mounted using optional bracket SRF-201. (Fig. 5).
- Prevent receiver's lens exposure to direct sun light, to prevent false alarm.
- For maximum reliability, locate the receiver as far as possible from fluorescent light or flickering lights.

NOTE: The transmitter unit is not sensitive to any of the above disturbance sources and may be placed wherever desired.

3.2 Mounting

- Insert a small screw driver into the slot on top of the unit, press lightly down and remove the cover.

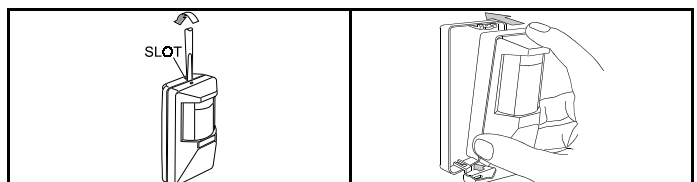


Figure 3. Cover Removal

Figure 4. Cover Replacement

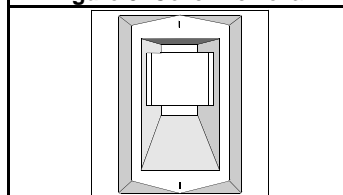


Figure 5. Flush Mounting Bracket SRF-201

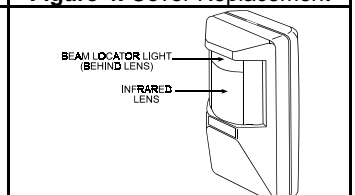


Figure 6. Beam Locator Light

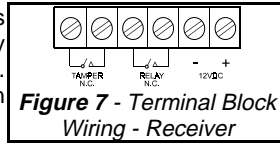
- B. Mount the base (with the P.C. board) in the selected location and height for optimum coverage. For surface mounting use the 2 base rear knockout holes. For corner mounting use the angled sides knockouts. The unit(s) must be fastened tightly to the mounting surface to avoid vibrations.
- C. To close the front cover (after wiring), insert the legs, located on the bottom of cover, into their respective slots in the bottom of the base and close by exerting slight downward.

3.3 Wiring

A. To route wires into the housing, use either the wiring knockouts or one of the lower circular mounting knockouts.

B. Wiring the receiver

- 1) Connect Tamper N.C. terminals to control panel normally closed 24h protection zone. Tamper contact opens when cover is removed.
- 2) Connect Relay N.C. terminals to control panel normally closed burglar protection zone. Relay contacts opens when an intruder is detected or during power loss.
- 3) Connect the 12VDC (+) and (-) terminals to 9-16VDC power source and verify correct polarity. Multiple receivers (IR-50 only) should be connected in parallel.



C. Wiring the transmitter

The transmitter requires only the connection of the supply voltage (9 -16 VDC) to the 12VDC (+) and (-) terminals.

Note: It is advisable to use power supply with battery back-up.

3.4 Alignment

Receiver and transmitter alignment is accomplished with Visible Beam Locator lights that operate through the upper section of the receiver's lens (for IR-150: receiver and the transmitter) (Fig. 6). The receiver should be aligned horizontally and vertically so that the LED light is fully visible through the Beam Locator section of the lens when viewed from the transmitter. The transmitter is then similarly aligned, using the transmitter Beam Locator light.

Three mode LED selector

The receiver's LED selector consists of a 4-pin connector and a jumper which can be inserted to link two pins, enabling three operational modes:

- A. **WALK/ALARM** (Jumper links pins 1-2) - This mode is used for walk testing. The LED lights up for 2-3 seconds whenever the beam is interrupted.
- B. **ALIGN** (Jumper links pins 2-3) - This mode is used for aligning. The LED lights continuously to enable convenient observation of the red light in the beam locator lenses (Fig. 6.)
- C. **OFF** (Jumper links pins 3-4) - This mode can be used to disable the LED after final test is completed, to prevent unauthorized persons from tracing the direction of the beam.

Note: The LED mode selection does not interfere with alarm relay operation, which will signal whenever the beam is interrupted.

For IR-150: The LED selector in the transmitter IRT-150 enables only two operational modes: ALIGN and OFF.

For aligning, move the jumper of the LED selector in both units to ALIGN. The LEDs should light continuously.

Horizontal Alignment

The field of view of each unit can be adjusted horizontally approximately 30°, by rotating the lens to the left or right. To adjust, remove the lens-locking devices, located on both sides of the lens, by pushing them from the inside of the cover. Rotate the lens carefully to the desired position. Holding firmly in place, insert locking devices from outside (ridges pointed outward) and firmly push into place until a click is heard. The transmitter is aligned similarly, using its Beam Locator light.

For IR-50: To align, look towards the receiver from the transmitter location. Move to the left and to the right of the transmitter, to

determine the area in which the Beam Locator light on the receiver is fully visible. Align the receiver's lens, so that the center of the area in which the Beam Locator light is fully visible will be approximately at the place where the transmitter is located.

Vertical Adjustment

The P.C. board vertical adjusting scale (IR-150: in both units) and the plastic pointer on the base indicate the approximate vertical angle in degrees between the receiver's (for IR-150: receiver's or transmitter's) line of sight and the horizontal line of the unit.

To change the vertical adjustment, loosen the screw which fastens the printed circuit board to the base. Slide the P.C. board up or down to the desired angle and tighten the screw firmly.

To align the receiver, look toward the receiver from the transmitter location. Align the receiver (vertically) so that the Beam Locator light will be fully visible from the floor level below the transmitter and up to the same distance above the transmitter (provided the distance between the transmitter and receiver is at least 20 times larger than their height from the floor). The transmitter is aligned similarly, using the Beam Locator light on the transmitter.

3.5 Final Test

The system should be checked at least once a week as follows:

- A. Move the LED selector jumper to **'WALK'** position. Replace the receiver front cover [IR-50: receiver(s)]. The LED should go off, indicating correct alignment of the receiver.
- B. Walk-test by crossing the path between the transmitter and receiver [IR-50: receiver(s)]. The receiver LED should light for 2-3 seconds indicating alarm condition caused by interruption of infrared beam barrier. This test should be performed with all fluorescent lights at the protected area turned on.
- C. Determine the signal margin by slowly covering the receiver lens from the bottom upward (using a piece of cardboard) until the LED lights up. The ratio between the size of the covered lens area and the total lens area (excluding the Beam Locator area) indicates the signal margin of the system. If alignment is correct, the signal margin should be more than 35 percent.
- D. Move the jumpers (IR-150: in both units) from 'WALK' to 'OFF' position to disable the LED and prevent unauthorized persons from ascertaining the path(s) of the infrared beam barrier(s).

The user should be instructed to cross the infrared barrier to assure an alarm output prior to each system arming.

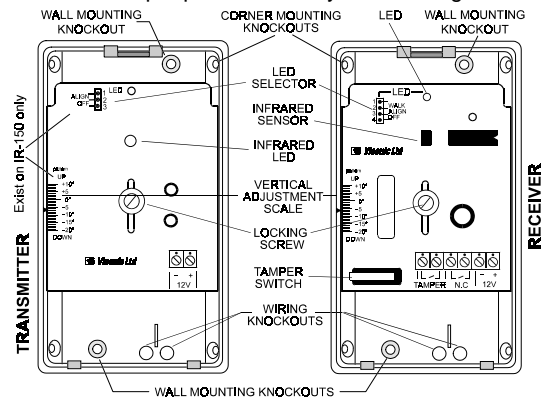


Figure 8. Printed Circuit Board

3.6 Avoiding Reflected Beam Paths

Eliminate reflected beams as follows:

- A. **For IR-50 only:** Apply piece of black insulation tape on inner side of transmitter window, to narrow the transmitter beam and allow emission of infrared energy only in the receiver direction.
- B. Change the receiver alignment (for IR-150: of receiver and transmitter), adjusting them away from the reflecting surface.
- C. Reduce receiver's sensitivity by lens partial covering (from inside). When the reflected beam barrier is eliminated recheck system signal margin (para. 3.5c.).



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