

ENFORCER
ENFORCER E-960-D90GQ
Twin Photobeam
Detectors



ENFORCER E-960-D90GQ Twin Photobeam Detectors Instruction Manual

[Home](#) » [ENFORCER](#) » ENFORCER E-960-D90GQ Twin Photobeam Detectors Instruction Manual 

Contents

- [1 ENFORCER E-960-D90GQ Twin Photobeam Detectors](#)
- [2 Product Usage Instructions](#)
- [3 Features](#)
- [4 Typical Installation](#)
- [5 Adjusting the Alignment](#)
- [6 Specifications](#)
- [7 Troubleshooting](#)
- [8 WARRANTY](#)
- [9 Documents / Resources](#)
 - [9.1 References](#)
- [10 Related Posts](#)



ENFORCER E-960-D90GQ Twin Photobeam Detectors



Specifications

- Model: E-960-D90GQ, E-960-D190GQ, E-960-D290GQ, E-964-D390GQ
- Outdoor Range: 90ft (30m) – 390ft (120m)
- Indoor Range: 190ft (60m) – 790ft (240m)

Product Information

The Twin Photobeam Detectors by ENFORCER provide reliable perimeter security with features such as four selectable beam frequencies (E-964-D390GQ only), weatherproof casing for indoor and outdoor use, automatic beam strength adjustment, and more. These detectors are designed to minimize false alarms caused by environmental factors.

Product Usage Instructions

Installation

Follow these steps for proper installation:

1. Choose a suitable location based on the provided guidelines to prevent false alarms.
2. Mount the transmitter and receiver using the included mounting hardware.
3. Ensure alignment using the built-in laser beam alignment system.

Testing and Alignment

After installation, test and align the detectors:

1. Adjust the alignment using the vertical and horizontal adjustment screws.
2. Use the viewfinder and alignment laser for precise alignment.

Troubleshooting

If you encounter issues, refer to the troubleshooting section in the manual for guidance on resolving common problems.

FAQ

- **Q: Are these detectors suitable for use in all environments?**

- A: No, these detectors are not designed for use in environments where explosive gases may be present. Ensure compliance with local laws and codes for specific security applications.

- **Q: What is included in the package?**

- A: The package includes mounting hardware, transmitter, receiver, mounting plates, and pole mounting brackets.

Features

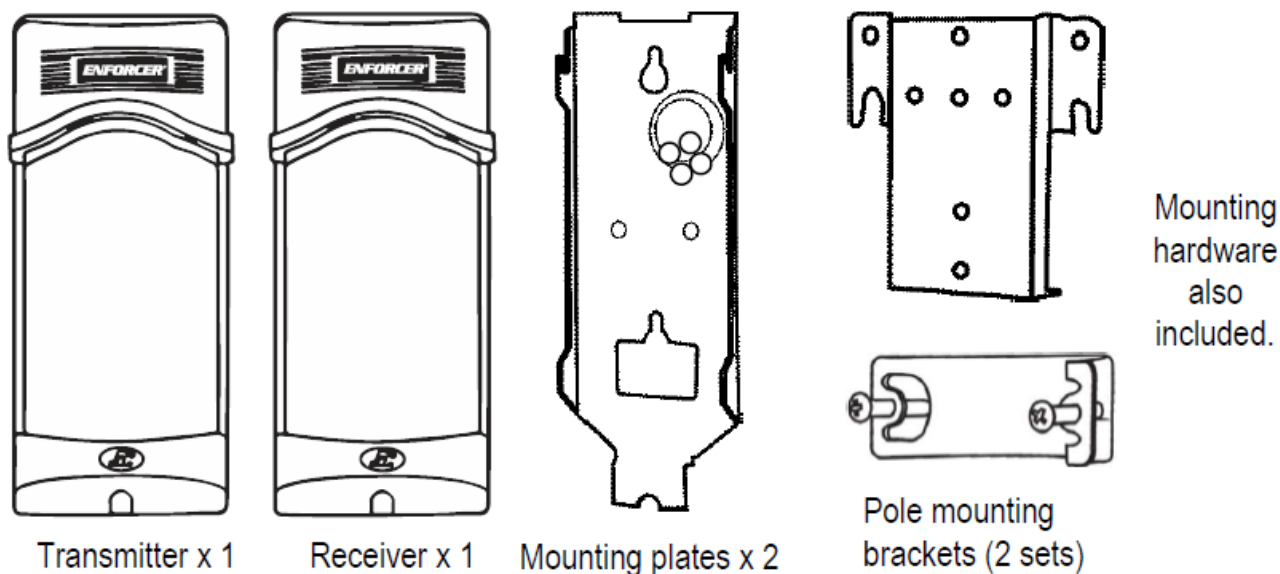
- Four selectable beam frequencies (E-964-D390GQ only)
- Twin beams provide reliable perimeter security, minimizing false alarms from birds, falling leaves, etc.
- Non-polarized power inputs
- Automatically adjusts beam strength to compensate for different weather conditions
- Automatic input power filtering with special noise rejection circuitry
- Lensed optics reinforce beam strength and provide excellent immunity to false alarms
- NO/NC trigger output
- N.C. tamper circuit included due to rain, snow, mist, etc.
- Quick, easy installation with built-in laser Weatherproof, sunlight-filtering case for beam alignment system indoor and outdoor use

IMPORTANT: The E-96x-DxxGQ series conforms to UL Std. 325 for gate operators that use the N.C. or 10kΩ resistor for monitoring.

Caution

- These sensors are not designed to prevent bodily injury or loss of life.
- These sensors are not designed for use in environments where explosive gases may be present.
- Use of these sensors in certain security applications may be regulated by local laws or codes. SECO-LARM is not responsible for compliance with such laws or codes.

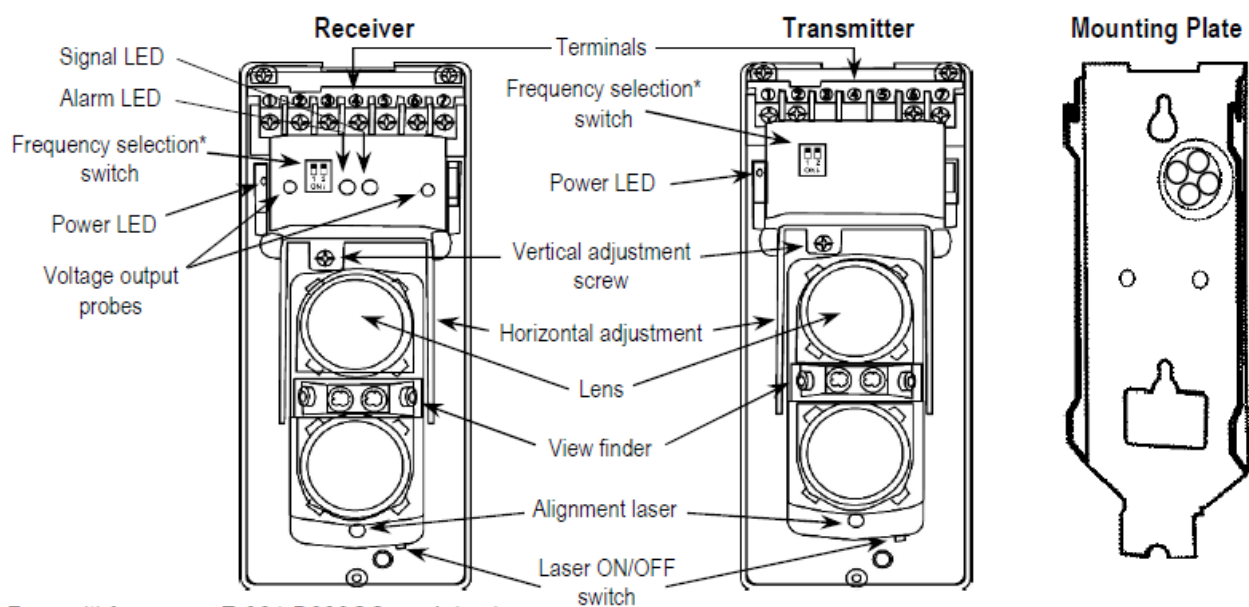
Included



IMPORTANT: Do not connect to power until the sensor is completely installed and the installation has been double-checked.

ENFORCER Twin Photobeam Detectors

Fig. 1: Identifying the Sensors



* For multi-frequency E-964-D390GQ model only.

Choose a Location

To prevent erratic operation and/or false alarms

- Wind will not directly cause false alarms, but could cause leaves or similar objects to fly or wave into the beams. Therefore, do not mount near trees, bushes, or other leafy vegetation.
- Do not mount where the transmitter or receiver could be splashed by water or mud.
- Do not mount where the unit could be suddenly exposed to a bright light, such as a floodlight or a passing automobile's headlight.
- Do not let sunlight or any direct beam of light enter the sensing spot of the transmitter. If needed, mount so the receiver, not the transmitter, faces the sun.
- Do not mount where animals could break the beams.

Fig. 2: Vertical and Horizontal Adjustments

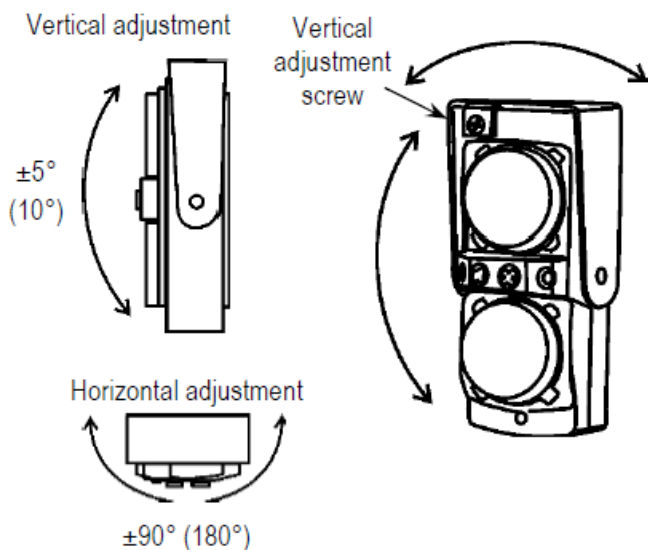
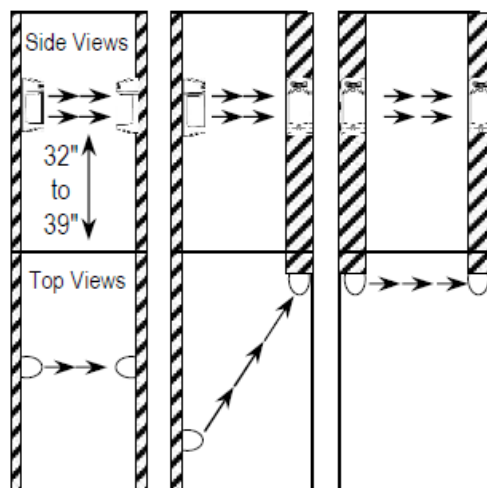


Fig. 3: Typical Installations



Typical Installation

- The photoelectric beam lens can be adjusted horizontally $\pm 90^\circ$, and vertically $\pm 5^\circ$ (see Fig. 2). This allows much flexibility in terms of how the transmitter and receiver can be mounted (see Fig. 3).
- Install at a distance of 32" to 39" (80 to 100 cm) above the ground for most situations (see Fig. 3).

Running the Cable

Run a cable from the control unit to the photobeam sensor. If burying the cable is required, make sure to use electrical conduit. Shielded cable is strongly suggested. See Table 1 for maximum cable length.

Table 1: Cable Length

Model	E-960-D90GQ		E-960-D190GQ		E-960-D290GQ		E-964-D390GQ	
Wire Size	12V	24V	12V	24V	12V	24V	12V	24V
AWG22 0.3 3mm ² 0.0005in ²	320m	2,800m	280m	2,400m	200m	1,600m	110m	900m
	1,050ft	18,000ft	920ft	7,870ft	660ft	5,250ft	390ft	2,950ft
AWG20 0.5 2mm ² 0.0008in ²	550m	4,800m	450m	4,200m	350m	3,000m	170m	1,400m
	1,800ft	15,750ft	1,480ft	13,780ft	1,150ft	9,840ft	560ft	4,590ft
AWG18 0.8 3mm ² 0.0013in ²	800m	7,200m	700m	6,200m	500m	4,200m	250m	2,200m
	2,600ft	23,620ft	2,300ft	20,340ft	1,640ft	13,780ft	820ft	7,220ft
AWG17 1.0 3mm ² 0.0016in ²	980m	8,800m	850m	7,600m	590m	5,200m	310m	2,600m
	3,190ft	28,870ft	2,790ft	24,930ft	1,940ft	17,060ft	1,020ft	8,530ft

NOTES

- Max. cable length when two or more sets are connected is the value shown in Table 1 divided by the number of sets.
- The power line can be wired to a distance of up to 3,300ft (1,000m) with AWG22 (0.33mm²) telephone wire.

Wiring the Transmitter – Wall Mount

1. Remove the cover. Remove the screw under the lens unit in order to detach the mounting plate (see Fig. 4, pg. 5).
2. If the sensor wiring comes from inside the wall
Break a hole in the mounting plate's rubber grommet, and pull the cable through the grommet's hole. Then run the cable through the hole near the top of the sensor unit so it comes out the front. Using two of the included mounting screws, attach the mounting plate to the wall. Then reattach the sensor unit to the mounting plate, connect the wires, and snap on the cover (see Fig. 5, pg. 5).
3. If the sensor wiring is run along the surface of the wall
There are two plastic knockouts on the back of the sensor unit, one on top and one on bottom. Break out the appropriate knockout, and pull the wiring through the knockout. Then run the wiring through the hole near the top of the sensor unit so it comes out the front. Using two of the included mounting screws, attach the mounting plate to the wall. Then reattach the sensor unit to the mounting plate, connect the wires, and snap on the cover (see Fig. 6, pg. 5).

Wiring the Transmitter – Pole Mount

NOTE: Pole mounting bracket required.

1. Remove the cover. Remove the screw under the lens unit in order to detach the mounting plate (see Fig. 4).
2. Break a hole in the mounting plate's rubber grommet, and pull the cable through the grommet's hole. Then run the cable through the hole near the top of the sensor unit so it comes out the front. Use the included mounting bracket to mount to the pole. Then reattach the sensor unit to the mounting plate, connect the wires, and snap on the cover (see Fig. 7).

Wiring (Fig. 8)

1. Screw the wires tightly to avoid slipping off the terminals, but not so tight that they break.
2. Screws on terminals which are not used should be tightened.
3. Grounding may be necessary, depending on the location.

Fig. 4: Remove the Transmitter Cover

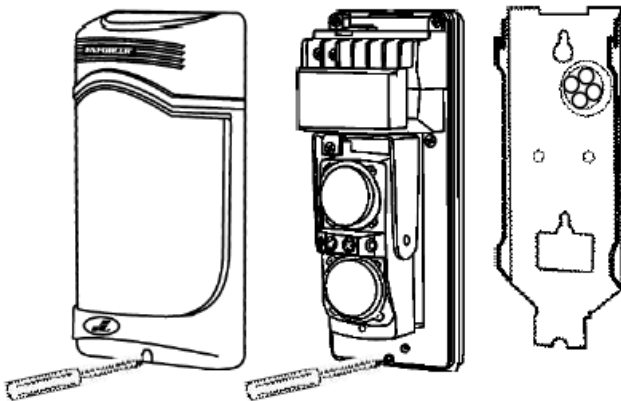


Fig. 5: Wall Mount, Wire from Inside Wall

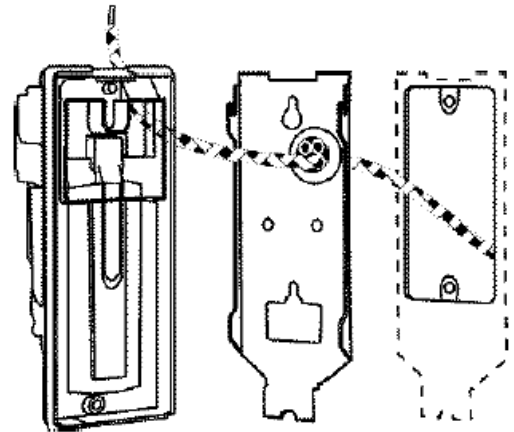


Fig. 6: Wall Mount, Wire Runs along Wall

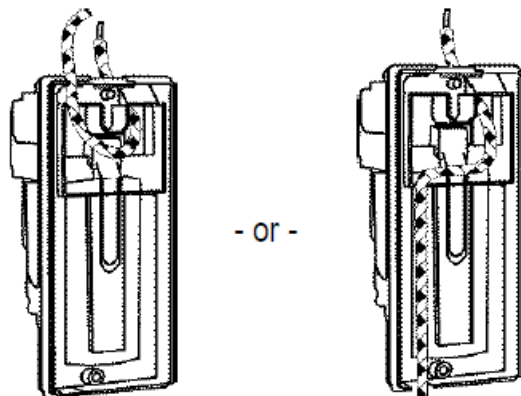


Fig. 7: Pole Mount

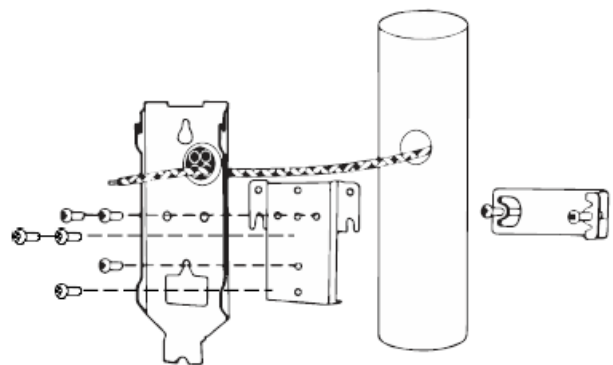


Fig. 8: Wiring

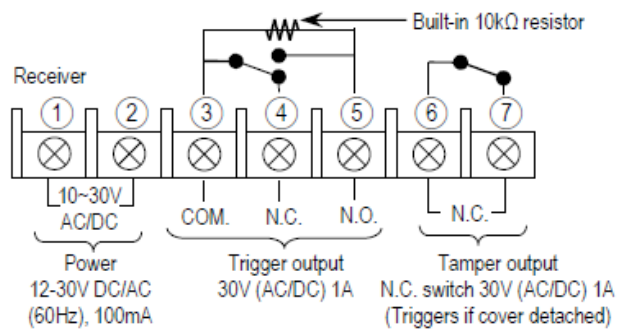
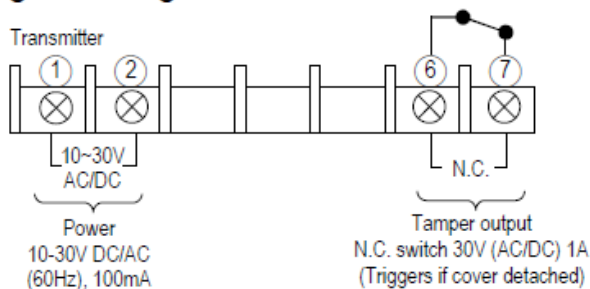
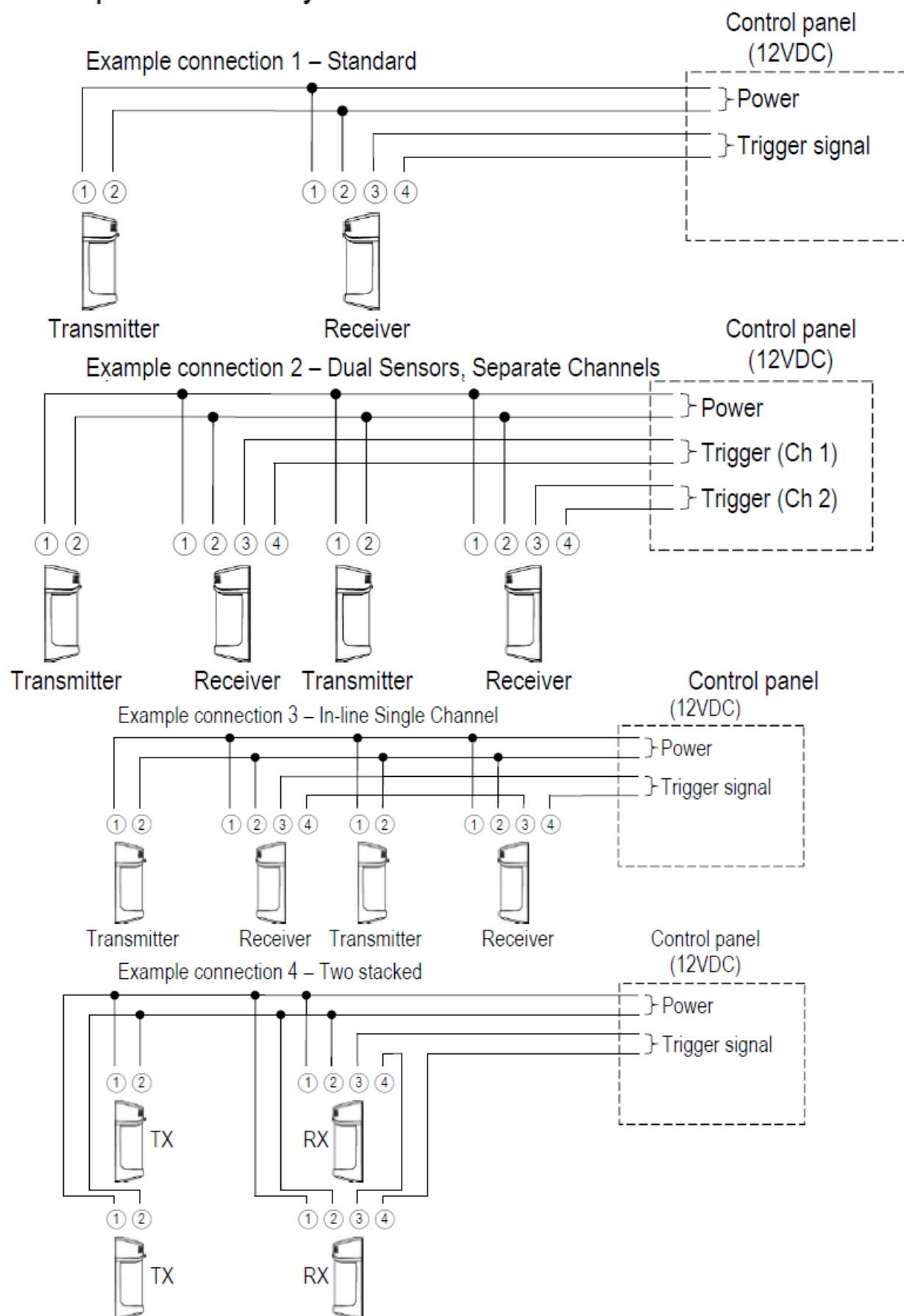


Fig. 9: Examples of Possible Ways to Connect One or More Sensors

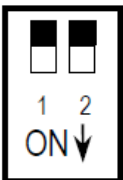
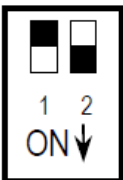
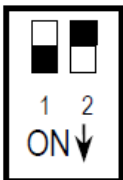
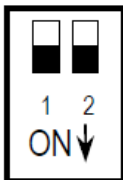


Selectable 4 – Channel Beam Frequency (For E-964-D390GQ Model Only)

The sensor beam frequency can be set at different levels on-site to avoid interference from other twin photobeam sensors nearby, which is useful during multiple sensor applications as shown below. To select between four different beam frequencies, adjust the beam channel switch of the transmitter side and receiver side. See Fig. 1 on pg. 3 for switch location and Table 2 for switch position.

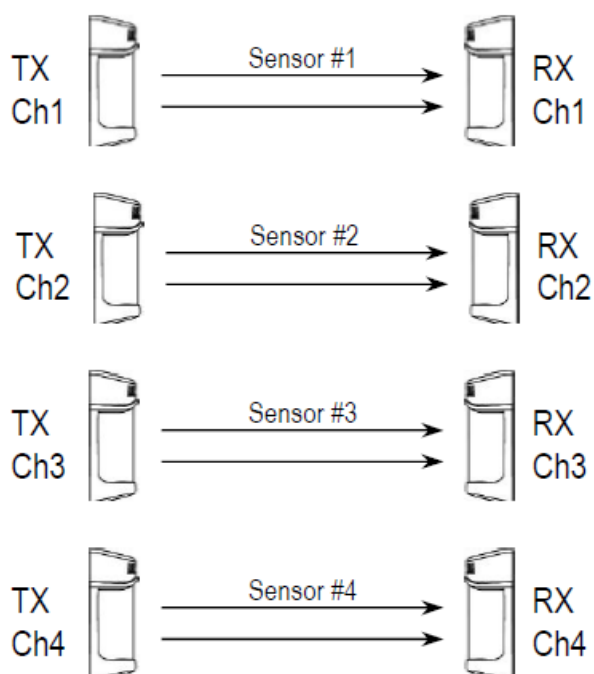
Important – The transmitter and receiver sensor pair must be set with the same frequency.

Table 2: Beam Frequency Selection Chart (For E-964-D390GQ model only)

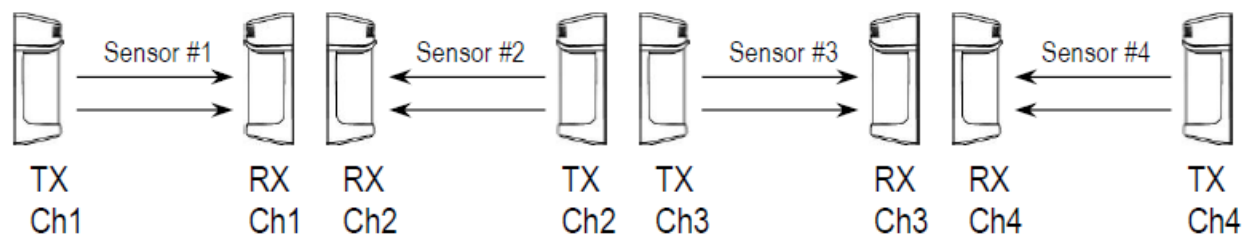
Frequency channel	Ch1	Ch2	Ch3	Ch4
Switch position				

Multiple Sensor Sample Application (For E-964-D390GQ model only)

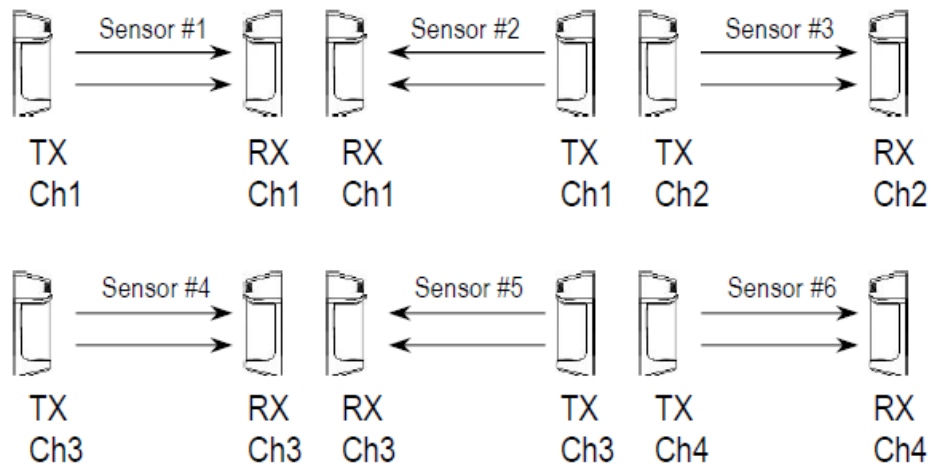
1. Single pair multiple layer application.



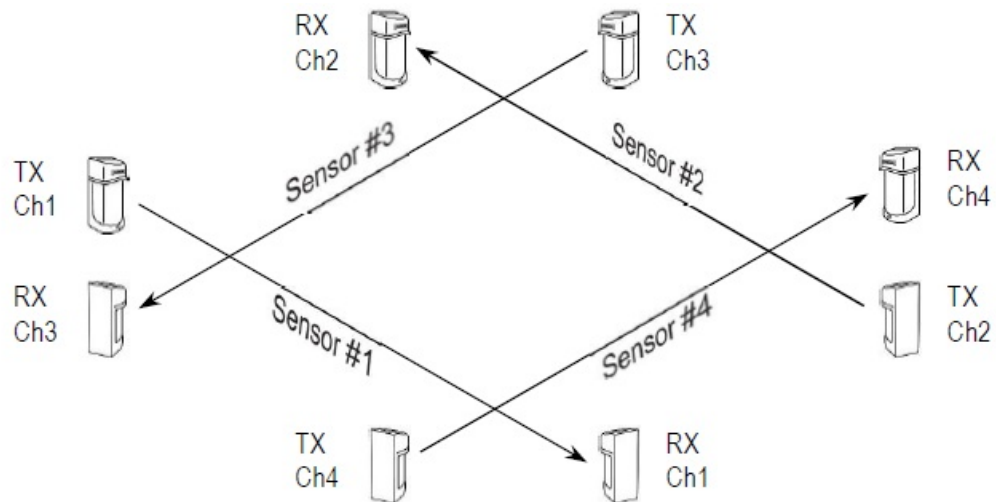
2. Long distance series application.



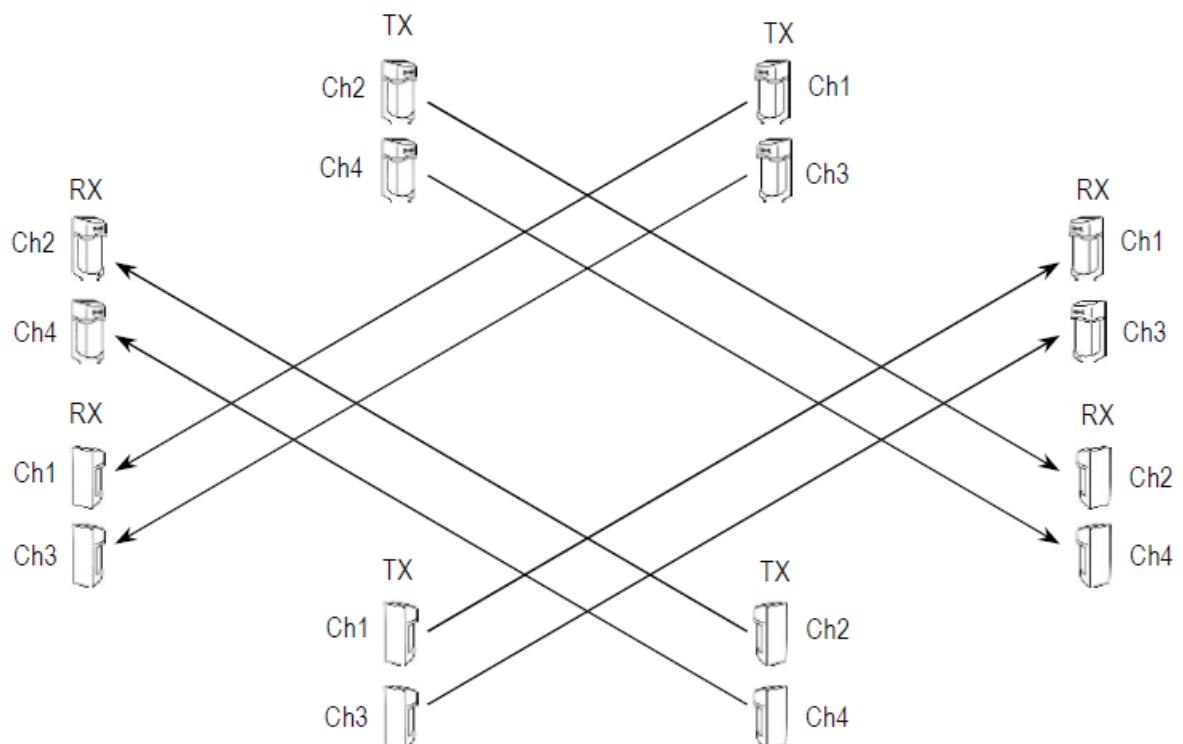
3. Two layer (double stacked) applications.



4. Perimeter security application.



5. Two layer (double stacked) perimeter security application.



Adjusting the Alignment

The transmitter and receiver sensor units can be adjusted $\pm 5^\circ$ vertically and $\pm 90^\circ$ horizontally once the unit is

mounted and power is connected (see Fig. 2 on pg. 3).

There are two ways to adjust alignment

1. Laser adjustment (see Fig. 1 on pg. 3):

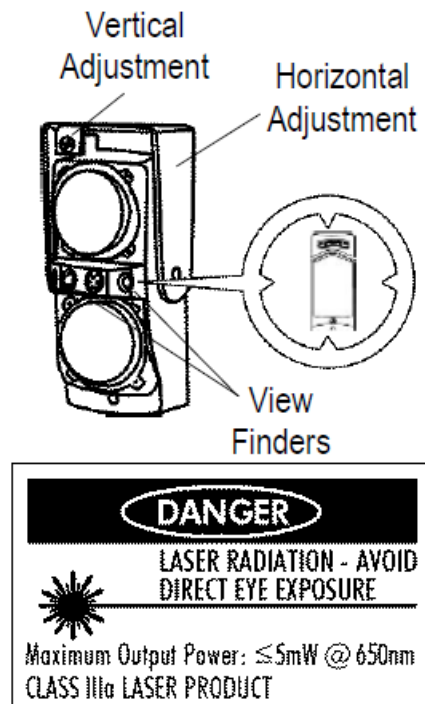
- Remove the transmitter cover, then turn the laser on with the ON/OFF switch (see Fig. 1 on pg. 3). A red dot will show where the photoelectric beams are aimed.
- Adjust the transmitter's sensor unit vertically and horizontally until the red dot is centered on the receiver and both the receiver's LEDs turn off (see Table 3). It may be necessary to adjust the horizontal and vertical angles of the receiver's sensor unit as well.
- Repeat steps a and b for the receiver.
- Turn the lasers off, and then replace the covers.

WARNING: Do not look directly at the lasers.

2. Eyeball adjustment (see Fig.10):

- Remove the transmitter cover and look into one of the alignment viewfinders (one of the four holes located between the two lenses) at a 45° angle.
- Adjust the horizontal angle of the lens vertically and horizontally until the receiver is clearly seen in the viewfinder.
- Repeat steps a and b for the receiver.
- Replace the transmitter and receiver covers.

Fig. 10:
Horizontal and Vertical
Sensor Adjustment



Trigger (Red LED)	Signal (Yellow LED)		Signal Strength
	Single frequency	Multi frequency	
OFF	OFF	OFF	Best
OFF	OFF	Flash	Good
OFF	ON	ON	Fair
ON	ON	ON	Re-adjust

NOTE – If you cannot see the opposite unit in the viewfinder, put a sheet of white paper near the unit to be seen, move your eyes about 2" (5cm) away from the viewfinder, and try again.

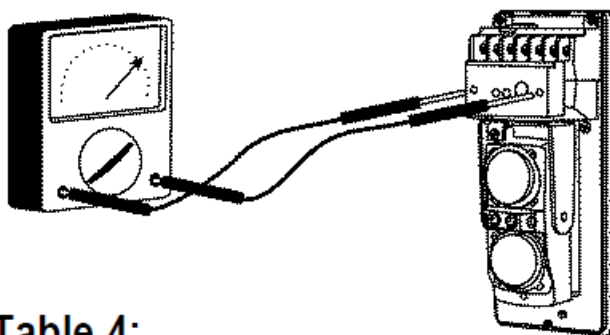
Fine Tuning the Receiver

- Once the sensor is mounted and aligned, the sensor can be fine-tuned using the voltage output jack.
 - Set the range of a volt-ohm meter (VOM) to 1~5 VDC.
 - Insert the red (+) probe into the (+) terminal and the black (-) probe into the (-) terminal.
 - Measure the voltage (see Table 4).
 - Adjust the horizontal angle by hand until the VOM indicates the highest voltage.
 - Adjust the vertical angle by turning the vertical adjustment screw until the VOM indicates the highest voltage.

NNOTE – Do not interrupt the beam while adjusting alignment.

Table 4

Voltage output		Alignment quality
Single frequency	Multi frequency	
>2.8V	>2.8V	Best
1.7~2.7 V	1.8~2.7 V	Good
1.1~1.6 V	1.1~1.7 V	Fair
<1.0V	<1.0V	Re-adjust



Testing the Unit

Table 4:

1. Power up the transmitter and receiver.
2. If the yellow or red LED remains steady ON even when the beam is not interrupted, re-adjust the alignment.
3. Walk between the transmitter and receiver to interrupt the beams. Walk at various speeds, and adjust the delay time adjustment knob as needed.

NOTE: The alarm will be triggered only if both the upper and lower beams are simultaneously interrupted.

IMPORTANT: Test the detector periodically to ensure the alignment and delay time settings are suitable for the site.

Specifications

Table 5: Specifications

Model	E-960-D90GQ	E-960-D190GQ	E-960-D290GQ	E-964-D390GQ
Max. range (outdoor)	90' (30m)	190' (60m)	290' (90m)	390' (120m)
Max. range (indoor)	190' (60m)	390' (120m)	590' (180m)	790' (240m)
No. of beam channel	N/A	N/A	N/A	4
Current draw	50mA max. (laser alignment only)			
	150mA max. (active operation excluding laser alignment)			
Operating voltage	12-30V DC/AC 60Hz, 200mA			
Detection method	Simultaneous breaking of 2 beams			
Interrupt speed	10ms			
Trigger output	SPDT NO/NC/COM relay, 1A@30 VDC/VAC, with built-in 10kΩ resistor on N.O. output			
Tamper output (TX & RX)	N.C. switch, 1A@30 VDC/VAC			
Sensor LED (RX)	Red LED – ON: When transmitter and receiver are not aligned or when beam is broken.			
Signal LED (RX)	Yellow LED – ON: When receiver's signal is weak or when beam is broken.			
Power LED (TX & RX)	Green LED ON: Indicates connected to power			
Laser wavelength	650nm			
Laser output power	≤5mW			
Alignment angle	Horizontal: ±90°, Vertical: ±5°			
Operating temperature	-13°~131° F (-25°~55° C)			
Weight	2.5-lb (1.1kg)			
Case	PC Resin			

NOTE: Depending on the monitoring system used by the gate motor, it may be necessary to use either NOTE:
Depending on the monitoring system used by the gate motor, it may be necessary to use either

Fig. 12: Overview

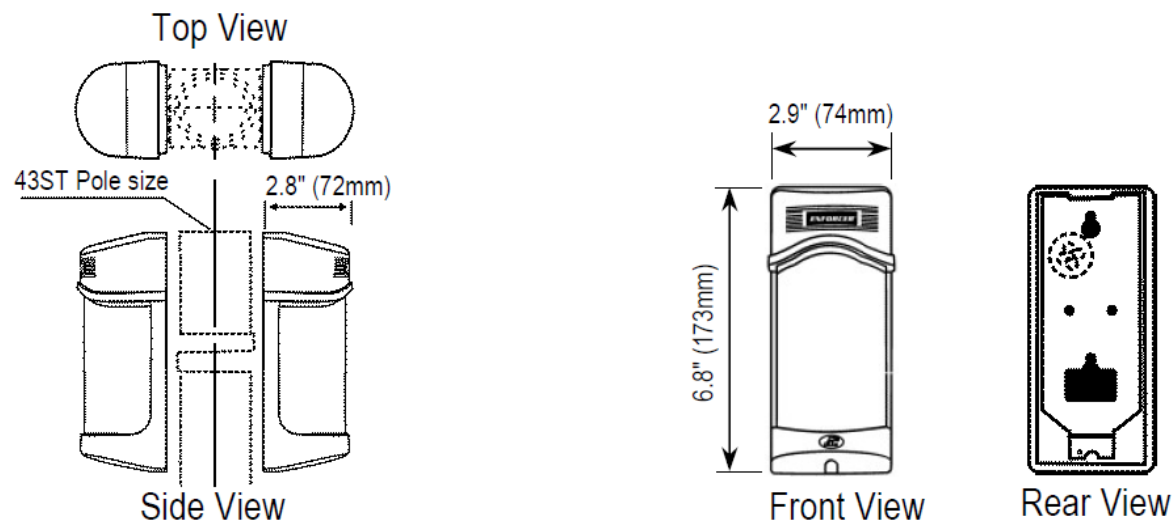
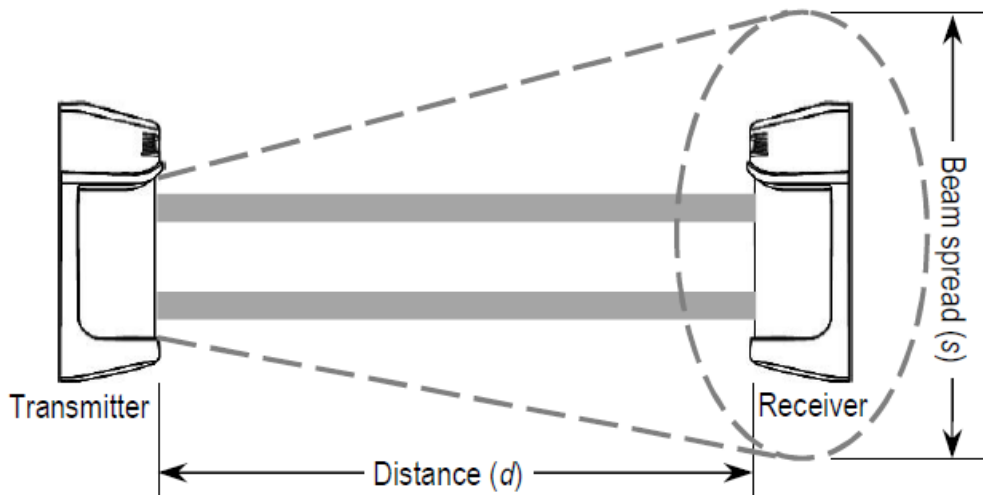


Fig. 13: Beam Spread

The beam spread (s) can be calculated as $s=0.03xd$.

Distance (d)	Beam spread (s)
90ft (30m)	2.7ft (0.8m)
190ft (60m)	5.7ft (1.7m)
290ft (90m)	8.7ft (2.7m)
390ft (120m)	11.7ft (3.6m)



Troubleshooting

Table 6: Troubleshooting

Situation	Possible Solution	Solution
Transmitter LED does not light	Incorrectly wired and/or insufficient voltage	Ensure the power supply to the transmitter is 12 to 30V DC/AC, 60Hz
Receiver LED never lights up when the beam is interrupted	<ul style="list-style-type: none"> • Insufficient voltage • Beam reflected away from receiver • Beams not simultaneously interrupted 	<ul style="list-style-type: none"> • Double-check the voltage • Clean the cover • Check overall installation
Beams interrupted and LED lights, but no trigger	Cable to the triggered device may be cut, or the relay contact stuck due to overloading	Check the continuity of the wiring between the sensor and the triggered device
Alarm LED continuously lit	<ul style="list-style-type: none"> • Lenses out of alignment • Beams are blocked • Cover is foggy or dirty 	<ul style="list-style-type: none"> • Realign the lenses • Remove any obstacles • Clean the cover
Trigger becomes erratic in bad weather	Lenses out of alignment	Check overall system installation. If still erratic, realign the lenses
Frequent false triggers from leaves, birds, etc.	Bad location	Change the transmitter and/or receiver location

IMPORTANT: Users and installers of this product are responsible for ensuring that the installation and configuration of this product complies with all national, state, and local laws and codes. SECO-LARM will not be held responsible for the use of this product in violation of any current laws or codes.

California Proposition 65 Warning: These products may contain chemicals which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov.

WARRANTY


This SECO-LARM product is warranted against defects in material and workmanship while used in normal service for one (1) year from the date of sale to the original customer. SECO-LARM's obligation is limited to the repair or replacement of any defective part if the unit is returned, transportation prepaid, to SECO-LARM. This Warranty is void if damage is caused by or attributed to acts of God, physical or electrical misuse or abuse, neglect, repair or alteration, improper or abnormal usage, or faulty installation, or if for any other reason SECO-LARM determines that such equipment is not operating properly as a result of causes other than defects in material and workmanship. The sole obligation of SECO-LARM and the purchaser's exclusive remedy, shall be limited to the replacement or repair only, at SECO-LARM's option. In no event shall SECO-LARM be liable for any special, collateral, incidental, or consequential personal or property damage of any kind to the purchaser or anyone else.

NOTICE: The SECO-LARM policy is one of continual development and improvement. For that reason, SECO-LARM reserves the right to change specifications without notice. SECO-LARM is also not responsible for misprints. All trademarks are the property of SECO-LARM U.S.A., Inc. or their respective owners. Copyright © 2024 SECO-LARM U.S.A., Inc. All rights reserved.

- SECO-LARM ® U.S.A., Inc.
- 16842 Millikan Avenue, Irvine, CA 92606

- Website: www.seco-larm.com
- Phone: [949-261-2999](tel:949-261-2999) | [800-662-0800](tel:800-662-0800)
- Email: sales@seco-larm.com

Documents / Resources



ENFORCER
Twin Photobeam Detectors
Manual

Model	Frequency	Beam Type	Beam Color
E-960-D90GQ	94.0 MHz	94.0 MHz	Red / Blue
E-960-D190GQ	94.0 MHz	94.0 MHz	Red / Blue
E-960-D290GQ	94.0 MHz	94.0 MHz	Red / Blue
E-964-D390GQ	94.0 MHz	94.0 MHz	Red / Blue
E-960-D90GQ	94.0 MHz	94.0 MHz	Red / Blue

SECO-LARM 317

[ENFORCER E-960-D90GQ Twin Photobeam Detectors](#) [pdf] Instruction Manual
E-960-D90GQ, E-960-D190GQ, E-960-D290GQ, E-964-D390GQ, E-960-D90GQ Twin Photobeam Detectors, E-960-D90GQ, Twin Photobeam Detectors, Photobeam Detectors, Detectors

References

- [La Armería de Madrid - fabricantes de armas y rifles](#)
- [P65Warnings.ca.gov](#)
- [User Manual](#)

[Manuals+](#), [Privacy Policy](#)

This website is an independent publication and is neither affiliated with nor endorsed by any of the trademark owners. The "Bluetooth®" word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. The "Wi-Fi®" word mark and logos are registered trademarks owned by the Wi-Fi Alliance. Any use of these marks on this website does not imply any affiliation with or endorsement.