

Installation Instructions

LaserSight RightSight™ PHOTOSWITCH® Photoelectric Sensors

Description

The 42EF LaserSight RightSight models use a Class 1 visible laser light and features the same mounting options as the rest of the industry proven RightSight product line. Class 1 lasers require no additional safety or protective training or equipment and are safe for general purpose use.

The multiple mounting options (threaded 18 mm nose and base mount or through-hole) allows for superior application flexibility in the most demanding industrial environments.

Features

- Small spot size suitable for high precision sensing
- Class 1 visible laser beam for ease of alignment
- 360° highly visible LED indicators
- Adjustment knob and teachable models
- Both NPN and PNP outputs
- IP54 rated enclosure

Description of Laser Class

Class I Laser Product

Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007.



Caution... Do not disassemble for repair

Use of control or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure. Do NOT attempt to disassemble this sensor for repair. A defective unit must be returned to the manufacturer.

Specifications

Environmental		
Certifications	cULus and CE marked for all applicable directives	
Operating Environment	IP54	
Operating Temperature [C (F)]	-10...+40° (14...+104°)	
Vibration	10...55 Hz, 1.5 mm amplitude, meets or exceeds IEC 60947-5-2	
Shock	30 g with 1 ms pulse duration, meets or exceeds IEC 60947-5-2	
Relative Humidity	5...95% (noncondensing)	
Optical		
Model	Sensing Range	Spot Size
Diffuse	0.0...300 mm (0.0...11.81 in.)	2 x 3.5 mm @ 300 mm
Polarized Retroreflective	0.05...15 m (0.0...49.2 ft)	16 x 20 mm (0.63 x 0.79 in.)
Transmitted Beam	0.0...40 m (0.0...131.2 ft)	50 x 70 mm (1.97 x 2.76 in.)
Adjustments	Adjustment knob or teach button per catalog number	
Electrical		
Voltage	24V DC ±10%	
Current Consumption	30 mA max.	
Sensor Protection	Reverse polarity, short-circuit, false pulse, overload	
Outputs		
Response Time	1 ms max. (4 ms for transmitted beam)	
Output Type	PNP and NPN	
Output Mode	Light operate or dark operate by catalog number	
Output Current	100 mA max.	
Mechanical		
Housing Material	Mindel	
Lens Material	Acrylic	
Connection Type	2 m cable, 4-pin DC micro (M12) pigtail	
Supplied Accessories	None	
Optional Accessories	Mounting brackets and cordsets	

Table 1: User Interface

LED Color	State	Status— Teachable and Adjustable Versions	Status— Transmitted Beam Receiver
Yellow	OFF	Output de-energized	
	ON	Output energized	
	Flashing	NA	Output SCP active
Orange	OFF	Normal operation	Margin <2.5x
	ON	Teach Mode Active	Margin >2.5x
	Flashing	Teach Mode Active	NA
Green	OFF	Sensor not powered	Sensor not powered, output on, or SCP active
	ON	Sensor powered	
	Flashing	Unstable margin condition (0.7x to 2.0x) or output SCP active	NA

Note: For laser models, output and margin LEDs flash simultaneously when SCP active.

Mounting the Sensor

Securely mount the sensor on a firm, stable surface or support. A mounting which is subject to excessive vibration or shifting may cause intermittent operation. Refer to www.ab.com/sensors for information on vertical and horizontal adjustment as well as fixed mounting brackets. The sensor is supplied with a single 18 mm mounting nut for either nose or base mounting options.

Wiring the Sensor

The RightSight photoelectric sensor is available in either a 2 m cable or 4-pin DC micro quick-disconnect as identified on page 1. Rockwell Automation recommends the use of the 889D Series of cordsets and patchcords for the QD models. All external wiring should conform to the National Electrical Code and all applicable local codes.

Configuring the Sensor

LaserSight RightSight photoelectric sensors are available in teachable, adjustable, and non-adjustable versions. Availability is determined by the sense mode.

- Standard Diffuse: Teachable and manual adjustable (potentiometer)
- Polarized Retroreflective: Teachable
- Transmitted Beam: No adjustment

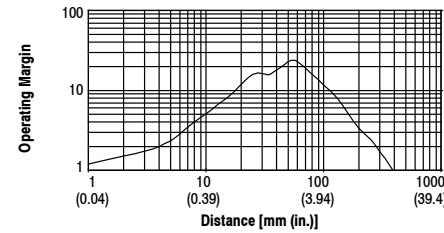
Follow the setup procedure below for the version of RightSight being configured.

Teachable Versions

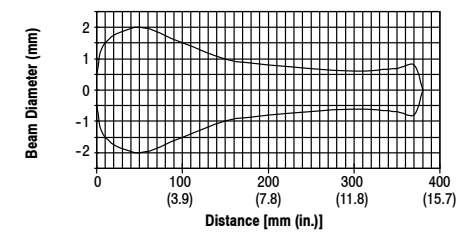
LaserSight RightSight photoelectric sensors with a teach function contain a pushbutton rather than a manual adjustment knob for adjusting the sensors sensitivity level. This function allows the sensor to “learn” both the light and dark conditions (background and target) presented to it and automatically adjusts sensitivity to its optimal level for the application. Follow the steps below to configure the sensor for your specific application.

Typical Response Curves

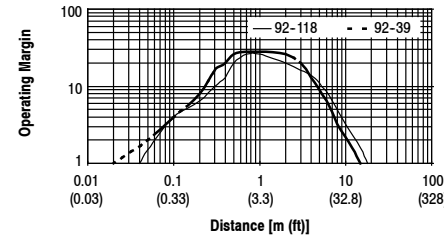
Standard Diffuse—Margin



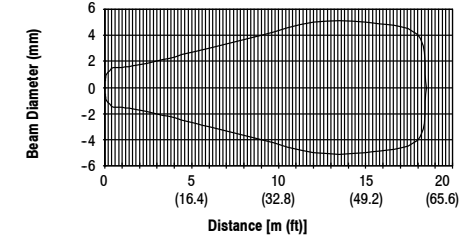
Standard Diffuse—Beam Pattern



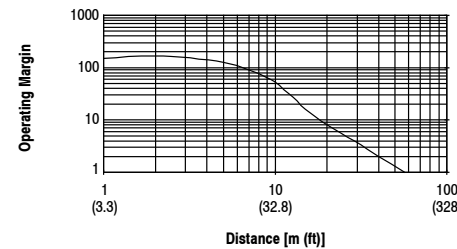
Polarized Retroreflective—Margin



Polarized Retroreflective—Beam Pattern



Transmitted Beam—Margin



1. Ensure that the sensor is securely mounted and wired. The green LED will be illuminated indicating that power is applied to the sensor.
2. With the sensor pointed at the light condition (target for diffuse, reflector for polarized retroreflective), press the pushbutton for five seconds and then release. The green PWR/STAB LED will turn OFF and the orange SET/SCP LED will turn ON and start flashing to indicate that the sensor has learned the light condition.
3. Present the dark condition to the sensor (no target for diffuse, target that blocks reflector for polarized retroreflective) and press the teach button for five seconds and then release. The orange SET/SCP LED will continue to flash while the teach pushbutton is pressed. The green PWR/STAB LED will turn ON after the teach button is released, indicating that the sensor is ready for normal operation.

Notes Regarding the Teach Function:

- The light condition (target for diffuse, reflector for retroreflective sense mode) must be presented first followed by the dark condition (no target for diffuse, target for retroreflective sense mode).
- A flashing green PWR/STAB LED indicates an unstable application condition (little contrast between light and dark conditions). This can be caused by improper alignment to the reflector (retroreflective sense mode) or due to a highly reflective background behind the target being sensed (diffuse sense mode). In this case of a diffuse sense mode, it may be necessary to use a background suppression sense mode in the application. A second cause can be due to excessive reflected light being returned to the sensor.

Manually Adjustable Versions

LaserSight RightSight photoelectric sensors with no teach function contain a manual adjustment knob for adjusting the sensors sensitivity level. This knob sets sensitivity from low (counterclockwise) to high (clockwise). Follow the steps below to configure the sensor for your specific application.

Diffuse Sense Mode (Light Operate)

1. Ensure that the sensor is securely mounted and wired. The green LED will be illuminated indicating that power is applied to the sensor. Turn sensitivity adjustment fully clockwise.
2. Visually align the sensor on the target until the yellow OUT LED turns ON.
3. To be certain that the beam is centered, it is required to sweep the sensor in the horizontal and vertical plane and determine at what position the yellow OUT LED turns ON and then OFF. Set the sensor halfway between both positions.
4. Remove the object in front of the sensor and eliminate any background signals by turning down the sensitivity adjustment, (if such background signals exist). Replace the object and verify that the yellow OUT LED turns ON and that the green PWR/STAB LED does not flash.

Transmitted Beam Versions (no adjustment)

1. Ensure that the sensor is securely mounted and wired. The green LED will be illuminated indicating that power is applied to the sensor.
2. Visually align the emitter and receiver units until the yellow OUT LED turns OFF. Also verify that the green PWR/STAB LED does not flash.
3. To be certain that the beam is centered, it is required to sweep the emitter or receiver in the horizontal and vertical plane and determine at what position the yellow OUT LED turns ON and then OFF. Set the sensor halfway between both positions.
4. Break the beam with the object to be detected and check if the yellow OUT indicator turns ON. If this does not happen, affix an aperture to both the emitter and receiver or increase the distance between the emitter and receiver. Restore the light beam by

removing the object and check if the yellow OUT LED turns OFF again and that the green PWR/STAB LED does not flash.

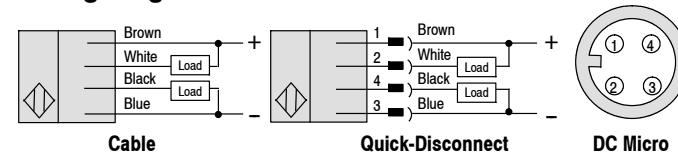
Short-Circuit Protection

RightSight photoelectric sensors provide short-circuit protection (SCP) on the output leads. This feature is intended to protect the sensor from damage in the event that the output load is shorted to ground. If this condition does occur, the SCP will activate and the both the red and green LED indicators will flash until the source of the short is removed. The SCP limits are set to approximately 100 mA over the entire voltage range.

Notes Regarding Reflectors

1. Maximum sense range for polarized retroreflective sense modes is based upon a 92-118 microcube reflector. Performance will vary with other reflector types.
2. Polarized retroreflective sense mode may exhibit white paper response between 50 and 300 mm.

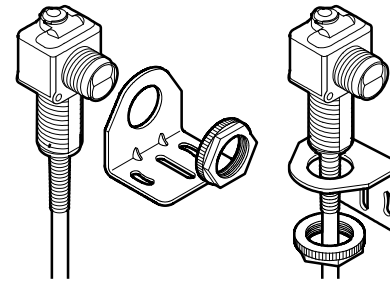
Wiring Diagrams



- ① For Allen-Bradley programmable controller compatible interface, refer to publication 42-2.0.
- ② All wire colors on quick-disconnect models refer to Allen-Bradley 889D cordsets.

Accessories

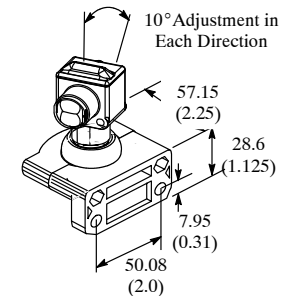
Right Angle Bracket #60-2657



Notes

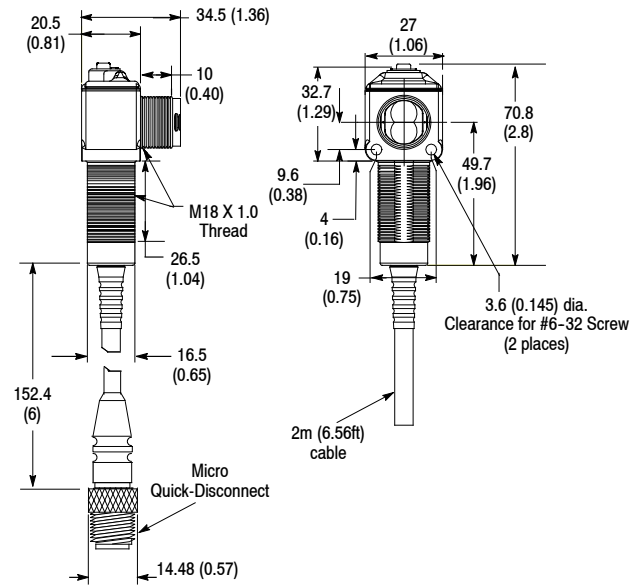
1. Damage may occur to sensor housing if torque above 20in-lb is applied to the 18mm locknut.
2. Optional mounting kit (60-2716) comes with two 75012-025-01, one 75012-097-01 locknut, internal tooth star washer, and screws/nuts for through-hole mounting.

Swivel/Tilt Bracket #60-2649

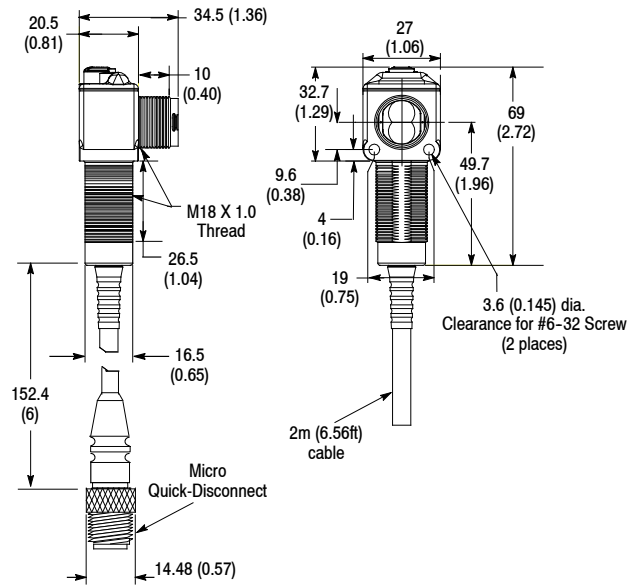


Dimensions

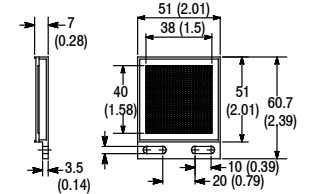
Teach Function Models



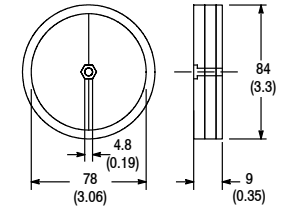
Adjustable Models



Microcube Reflector #92-118



76 mm Reflector #92-39



2 m QD Cordset #889D-F4AC-2

