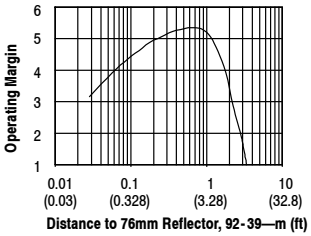
Installation Instructions
RightSight™ DeviceNet™ PHOTOSWITCH® Photoelectric Sensors

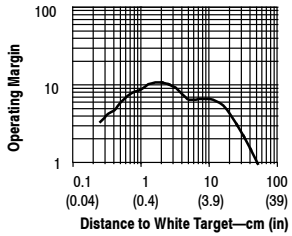
Sensing Mode			Polarized Retroreflective	Diffuse	Sharp Cutoff Diffuse	Background Suppression		Glass Fiber Optic	Transmitted Beam		
		Version				50mm (2in)	100mm (4in)		20m Receiver	4m Receiver	Source
Cat No.		5-pin micro QD	**42EF-P2LDB-F5**	**42EF-D1LDAK-F5**	**42EF-SIMDA-F5**	**42EF-B1LDBC-F5**	**42EF-B1LDBE-F5**	**42EF-G1LDA-F5**	**42EF-R9LDB-F5**	**42EF-R9LDBV-F5**	**42EF-E1EDZB-F5**
		2m cable	Consult factory								**42EF-E1EZB-A2**
Optical	1	Sensing Distance	3m (9.8ft)	500mm (20in)	<127mm (5in)	50mm (2in)	100mm (4in)	Varies with fiber optic cable	20m (60ft)	4m (13ft)	20m (60ft)
	2	Field of View	1.5°	5°	7°	20°	8°		7°		Not applicable
	3	Transmitting LED	Visible Red 660nm	Infrared 880nm					Not applicable		Infrared 880nm
	4	Sensitivity Adjustment	No	Yes		No		Yes	No		
Electrical	5	Supply Voltage	11-25V DC								
	6	Current Consumption	65mA maximim								
	7	Power Consumption	1.6W maximum								
	8	Response Time	3ms	3ms	3ms	3ms	3ms	3ms	11ms	11ms	Not applicable
	9	Protection	Output: short circuit protected, Power: Reverse polarity, False Pulse (300ms power ON delay)								Power: Reverse polarity
Mechanical	10	Housing Material	Mindel								
	11	Lens Material	Acrylic								
	12	Indicators	See Table 1.								Green: Power
Environmental	13	Operating Temperature	-25° to +70°C (-13° to +158°F)								
	14	Operating Environment	NEMA 4X, 6P, IP67; 8270kPa (1200psi) washdown								
	15	Vibration	10-55Hz, 1mm amplitude, meets or exceeds IEC 947-5-2								
	16	Shock	30G, meets or exceeds IEC 947-5-2								
	17	Relative Humidity	95%								
	18	Approvals	UL, CSA, CE for all applicable directives, DeviceNet conformance tested								
DeviceNet	19	Network Interface	DeviceNet								
	20	Protocol	Selectable Change-of-State (COS) or Strobing								
	21	Operating Mode	Selectable Light/Dark operate								
	22	Autobaud Detect	Selectable ON/OFF								
	23	Communication Rate	Selectable 125kb, 250kb, 500kb								
	24	Supported Node Address	Selectable 0 to 63 (63 factory default)								
	25	Timer	ON Delay and OFF Delay/One Shot (0 to 65,535ms, 1 or 10ms time base)								
	26	Counter	Adjustable with output bit (0 to 65,535 counts)								
	27	Motion Detect	Adjustable with output bit (0 to 65,535ms, 1ms time base)								
	28	Margin Diagnostic	Selectable with dual thresholds (0.7 to 1.5 and 0.7 to 2.0)								
	29	Margin Diagnostic Type	Selectable static or dynamic								

Typical Response Curves

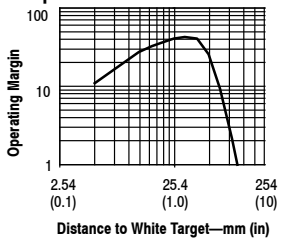
Polarized Retroreflective



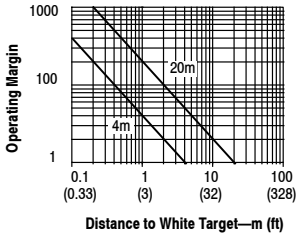
Diffuse



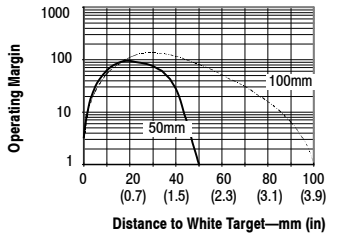
Sharp Cutoff Diffuse



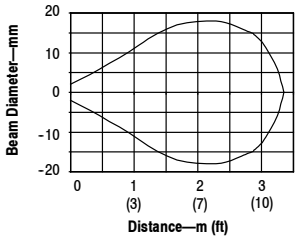
Transmitted Beam



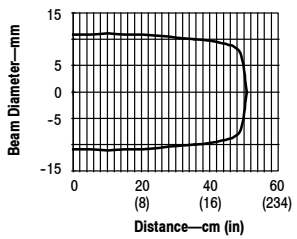
Background Suppression



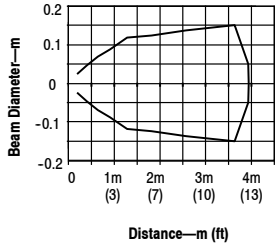
Polarized Retroreflective Beam Pattern



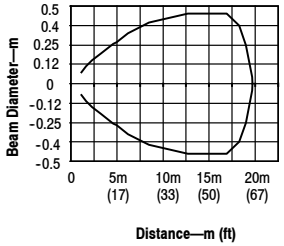
Diffuse Beam Pattern



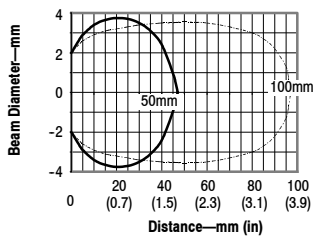
Transmitted Beam—4m Beam Pattern



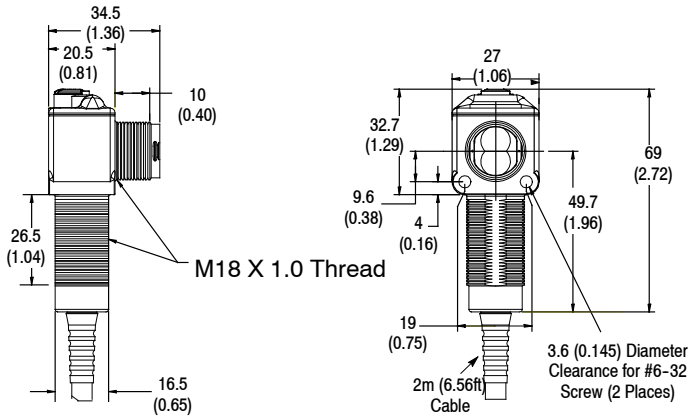
Transmitted Beam—20m Beam Pattern



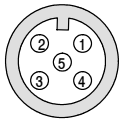
Background Suppression Beam Pattern



Sensor Dimensions—mm (inches)



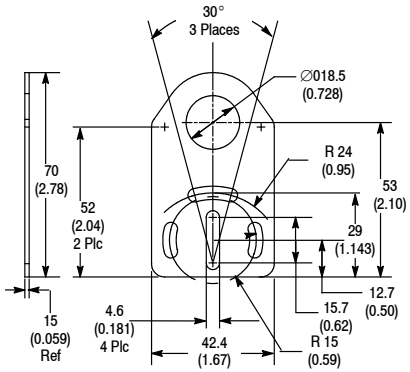
Wiring Diagram



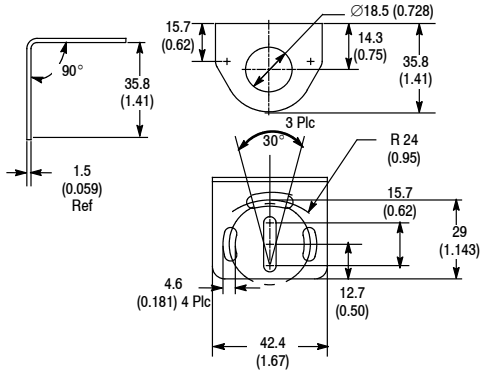
Pin	Function	Color
1	drain	Bare
2	V+	Red
3	V-	Black
4	CAN_H	White
5	CAN_L	Blue

Accessories

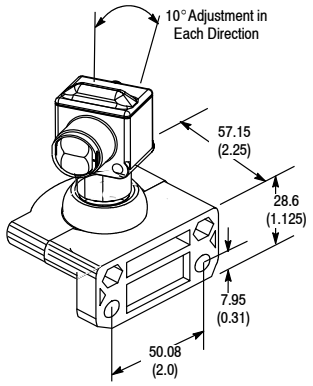
Straight Bracket #60-2656



Right Angle Bracket #60-2657

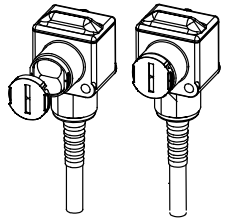


Swivel/Tilt Bracket #60-2649



Apertures

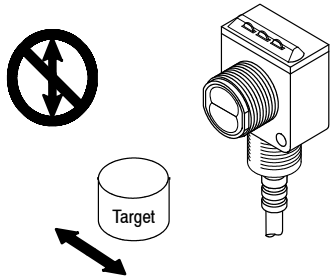
(Transmitted Beam Only)



Note: 18mm nut must be installed prior to installing aperture if threads on optics snout are to be used.

1mm Qty. 20 **#60-2660**
2mm Qty. 20 **#60-2661**
4mm Qty. 20 **#60-2662**
Aperture Set (4 each) **#60-2659**

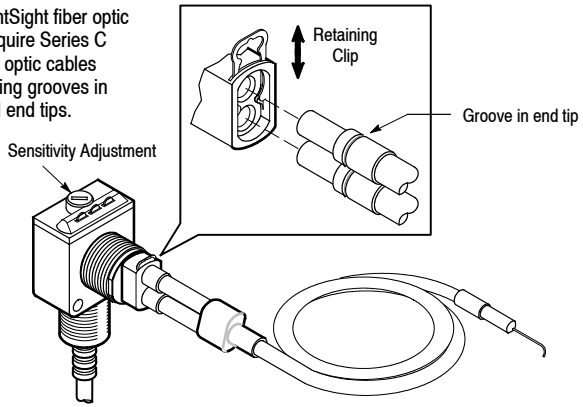
Background Suppression Sensors



Note: Due to the detection method, targets traveling horizontal to the sensor's optics are detected. Targets traveling vertically may not be accurately detected. For reliable background suppression, a minimum separation distance of 6mm (0.24in) is recommended between the target and the backgrounds.

Glass Fiber Optic Sensors

Note: RightSight fiber optic models require Series C glass fiber optic cables with retaining grooves in the control end tips.



Cordsets and Accessories

Description	Catalog Number
2m (6.5ft) micro QD Cordset	1485R-P2R5-C
2m (6.5ft) micro QD Patchcord	1485R-P2R5-F5
RS-232 PC Interface Module	1770-KFD
DeviceNet Manager Software	1787-MGR
PCMCIA DeviceNet Interface Card	1784-PCD
DeviceNet Hand-Held Configurator	2707-DNC
Reflector, 3″ Diameter	92-39
Reflector, 1.5″ Diameter	92-47
Other DeviceNet Products	See Pub. DN-2.5

Data Byte 1

	Bit 0	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7
	Output	**Diagnostic**	**Margin 1**	**Margin 2**	**Motion Detect**	**Counter Output**	**Not Used**	**Not Used**
0	OFF	OK	OK	OK	Motion	Less Than Preset		
1	ON	ALARM	Margin Unstable	Margin Unstable	No Motion	Preset Reached		

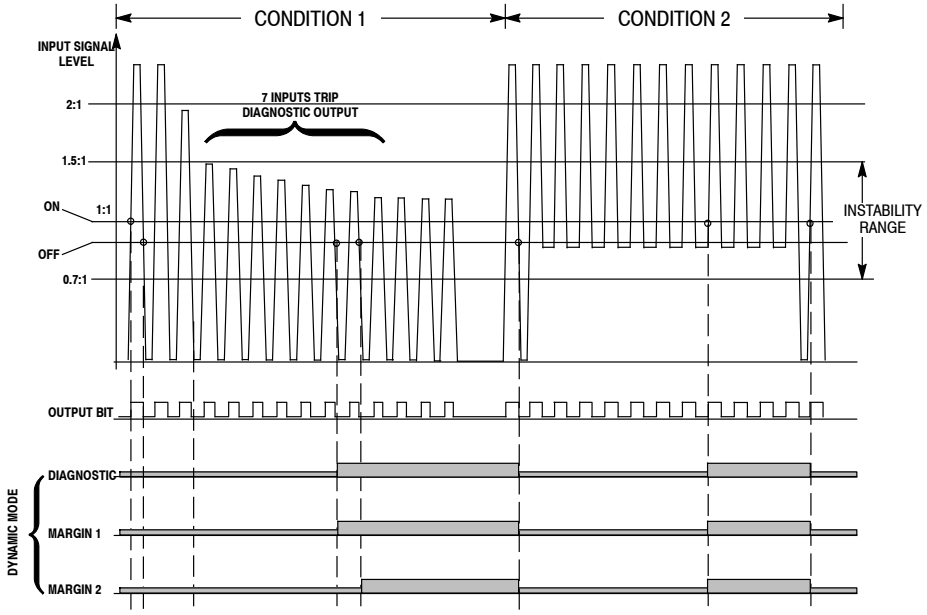
Configuration

RightSight DeviceNet photoelectric sensors interface directly to the network without the need for a DeviceLink™ adaptor. After securing the sensor to a stable surface or support, it will be necessary to configure some of the parameters shown on Table 2 using a suitable network configuration tool such as the Rockwell DeviceNet Manager. For remote configuration the DeviceView Hand-Held Configurator (2707–DNC) is available.

Diagnostic Operation

The RightSight DeviceNet photoelectric sensor provides two independent diagnostic outputs to indicate an unstable sensing condition. These two diagnostic outputs may be configured to operate in one of two possible modes. The first, *static*, is designed for web sensing or other applications in which an immediate diagnostic output is required. In this mode, the output bits are triggered whenever an “unstable” signal is detected. The *dynamic* operating mode is useful in repetitive applications where targets are constantly moving into and out of the sensors field of view. In this mode, the output bits are triggered only after detection of seven successive “unstable” signals. This prevents “false triggering” caused by the leading and trailing edges of the target.

Table 2 specifies the range of margins defined as unstable for each of the two outputs, Margin Diagnostic 1 and Margin Diagnostic 2. A third diagnostic output bit is also provided. This output will be activated when either the Margin 1 or Margin 2 diagnostic, or the Motion Detect preset values is reached.



When operating in static mode margin output 1 and 2 will trip when input signal level falls inside preset threshold.

Table 1. LED Function

Label	Color	State	Status
Output	Yellow	ON	Target detected
Margin	Orange	OFF	Margin < 2.0
		ON	Margin >2.0
Status	Red/Green	OFF	Sensor not powered
		Green ON Steady	Sensor active and allocated by master
		Green Flashing	Sensor active but not allocated by master
		Red Flashing	Minor correctable fault (baud rate)
		Red ON Steady	Major fault (possible duplicate address)

Table 2. Configuration Parameters

Parameter	Type	Options	Default
Light Source Detected	R	Detected, not detected	
Operate Mode	R,W	Light or dark operate	Light operate
Sensor Output	R	Bit 0: 0=output OFF, 1=output ON	
Margin LED	R	0=margin < 2.0, 1=margin >2.0	
Diagnostic Mode	R,W	Dynamic or static	Dynamic
Margin Diagnostic 1	R	Bit 2: 0=margin OK, 1= margin unstable (Fixed at 0.7 to 1.5)	
Margin Diagnostic 2	R	Bit 3: 0=margin OK, 1= margin unstable (Fixed at 0.7 to 2.0)	
Diagnostic	R	Bit 1: 0=OK, 1=alarm (tied to margin and motion detect)	
On-Delay Timer Enabled	R,W	Disabled or on-delay	Disabled
On-Delay Timer Timebase	R,W	1ms or 10ms	1ms
On-Delay Timer Preset	R,W	0 to 65,535ms	0ms
On-Delay Timer Elapsed Time	R	—	
Off-Delay Timer or One-shot Enabled	R,W	Disabled, One-shot, Off-delay	Disabled
Off-Delay Timer or One-shot Timebase	R,W	1ms or 10ms	1ms
Off-Delay Timer or One-shot Preset	R,W	0 to 65,535ms	0ms
Off-Delay Timer or One-shot Elapsed Time	R,W	—	
Up Counter Enabled	R,W	Disabled or Up Counter	Disabled
Counter Preset	R,W	0 to 65,535 counts	0 counts
Counter Value	R	—	
Counter Output	R	Bit 5: 0=value less than preset, 1=value equal preset	
No Motion Detect	R	Bit 4: 0=motion, 1= no motion	
No Motion Detect Preset	R,W	0 to 65,535ms	0ms
Autobaud	R,W	Enable or disable	Enable
Configuration Consistency Value	R	—	0
Communication Rate	R,W	125, 250, 500kB	125kb
Node Addressk	R,W	0 to 63	63
Operating Protocol	R,W	COS or strobing	COS

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