

OPT Series Photoelectric Sensors

**OPT2135**

- Standard housing with long range and small spot diameter
- Simple potentiometer sensitivity adjustment
- Visible light spot allows easy targeting set-up
- LO/DO (Light-on/Dark-on) antivalent (complementary N.O./N.C.) outputs
- Clear glass detection models available
- Flexible mounting options available
- IO-Link compatibility



OPT Series Photoelectric Sensors (Diffuse with Background Suppression) Selection Chart

Part Number	Price	Adjustable Sensing Range (mm [in])	Switching Frequency	Emission Type	Logic	Connection	Wiring	Drawing Link
OPT2147	\$98.00	50-200 [1.97-7.87]	800 Hz	Visible red 633nm	PNP	4-pin M12 quick-disconnect	Diagram 1	PDF
OPT2148	\$98.00	50-200 [1.97-7.87]	800 Hz	Visible red 633nm	NPN	4-pin M12 quick-disconnect	Diagram 2	PDF
OPT2149	\$98.00	60-500 [2.36-19.69]	800 Hz	Visible red 633nm	PNP	4-pin M12 quick-disconnect	Diagram 1	PDF
OPT2150	\$98.00	60-500 [2.36-19.69]	800 Hz	Visible red 633nm	NPN	4-pin M12 quick-disconnect	Diagram 2	PDF
OPT2153	\$94.00	100-1200 [3.94-47.24]	500 Hz	Visible red 633nm	PNP	4-pin M12 quick-disconnect	Diagram 1	PDF
OPT2154	\$94.00	100-1200 [3.94-47.24]	500 Hz	Visible red 633nm	NPN	4-pin M12 quick-disconnect	Diagram 2	PDF
OPT2157	\$207.00	50-300 [1.97-11.81]	800 Hz	Class 1 Laser	PNP	4-pin M12 quick-disconnect	Diagram 1	PDF
OPT2158	\$207.00	50-300 [1.97-11.81]	800 Hz	Class 1 Laser	NPN	4-pin M12 quick-disconnect	Diagram 2	PDF

Note: Brackets sold separately.

OPT Series Photoelectric Sensors (Retro Reflex) Selection Chart

Part Number	Price	Adjustable Sensing Range (m [ft])	Switching Frequency	Emission Type	Logic	Connection	Wiring	Drawing Link
OPT2133	\$76.00	0-7 [0-22.97]*	2000 Hz	Visible red 633nm	PNP	4-pin M12 quick-disconnect	Diagram 1	PDF
OPT2134	\$76.00	0-7 [0-22.97]*	2000 Hz	Visible red 633nm	NPN	4-pin M12 quick-disconnect	Diagram 2	PDF
OPT2135	\$85.00	0.02-11 [0.07-36.09]*	2000 Hz	Visible red 633nm	PNP	4-pin M12 quick-disconnect	Diagram 1	PDF
OPT2136	\$85.00	0.02-11 [0.07-36.09]*	2000 Hz	Visible red 633nm	NPN	4-pin M12 quick-disconnect	Diagram 2	PDF
OPT2137	\$207.00	0-9.5 [0-31.16]	2000 Hz	Class 1 Laser	PNP	4-pin M12 quick-disconnect	Diagram 1	PDF
OPT2138	\$207.00	0-9.5 [0-31.16]	2000 Hz	Class 1 Laser	NPN	4-pin M12 quick-disconnect	Diagram 2	PDF

* Based on a 100mm x 100mm [3.94 in x 3.94 in]

Note: Reflectors and brackets sold separately.

OPT Series Photoelectric Sensors (Retro Reflex for Clear Glass Detection) Selection Chart

Part Number	Price	Sensing Range (m [ft])	Switching Frequency	Emission Type	Logic	Connection	Wiring	Drawing Link
OPT2139	\$119.00	0-2.6 [0-8.53]*	2000 Hz	Visible red 633nm	PNP	4-pin M12 quick-disconnect	Diagram 1	PDF
OPT2140	\$119.00	0-2.6 [0-8.53]*	2000 Hz	Visible red 633nm	NPN	4-pin M12 quick-disconnect	Diagram 2	PDF

* Based on a 100mm x 100mm [3.94 in x 3.94 in]

Note: Reflectors and brackets sold separately.

OPT Series Photoelectric Sensors (Through-Beam) Selection Chart

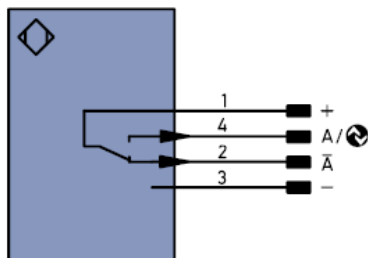
Part Number	Price	Sensing Range (m [ft])	Switching Frequency	Emission Type	Logic	Connection	Wiring	Drawing Link
Emitter								
OPT2132	\$72.00	20 [65.62]	-	Visible red 633nm	-	4-pin M12 quick-disconnect	Diagram 3	PDF
Receivers								
OPT2130	\$66.00	20 [65.62]	1000 Hz	-	PNP	4-pin M12 quick-disconnect	Diagram 1	PDF
OPT2131	\$66.00	20 [65.62]	1000 Hz	-	NPN	4-pin M12 quick-disconnect	Diagram 2	PDF

Note: Brackets sold separately.

OPT Series Photoelectric Sensors

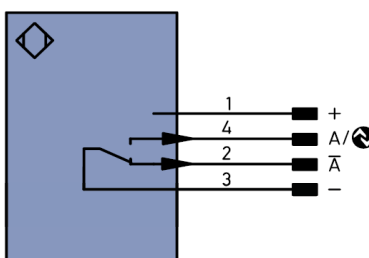
Wiring Diagrams

Diagram 1
PNP



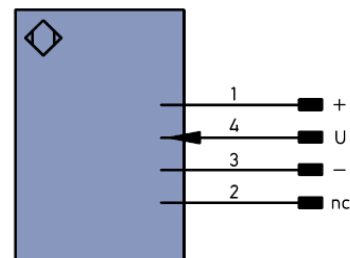
- + Supply Voltage +
- Supply Voltage 0V
- A Switching Output (N.O.)
- $\bar{A}$ Switching Output (N.C.)
-  IO-Link

Diagram 2
NPN



- + Supply Voltage +
- Supply Voltage 0V
- A Switching Output (N.O.)
- $\bar{A}$ Switching Output (N.C.)
-  IO-Link

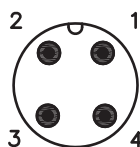
Diagram 3
Emitter



- + Supply Voltage +
- Supply Voltage 0V
- U Test Input
- nc No Connection

Connector

M12 Connector



OPT Series Photoelectric Sensors

OPT Series Photoelectric Sensor Specifications				
Type	Diffuse With Background Suppression	Retro Reflex	Retro Reflex for Clear Glass	Through-Beam
Sensing Distance	Refer to Photoelectric Sensors Selection Guide (OPT Series)			
Light Spot Diameter	See tables below			
Sensitivity	Adjustable via potentiometer			
Output State	Antivalent*			
Operating Voltage	15-30VDC	10-30VDC		
Supply Power IO-Link	18-30VDC			
No Load Supply Current	< 20mA			< 20mA emitter; < 25mA receiver
Operating (Load) Current	100mA			
Off-state (Leakage) Current	< 50μA			
Voltage Drop	< 2V			
Ripple	N/A			
Time Delay Before Availability (tv)	N/A			
Short-Circuit Protection	Yes			
Operating Temperature	-40 to 60°C [-40 to 140°F]	-40 to 60°C (-40 to 140°F) (OPT2137 and OPT2138) -25 to 60°C [-13 to 140°F]	-40 to 60°C [-40 to 140°F]	-40 to 60°C [-40 to 140°F]
Thermal Drift	< 5%	< 10%	< 3%	< 10%
Protection Degree (DIN 40050)	IP67 IP68			
LED Indicators	Blue - power Amber - output state “on”			
Housing Material	Plastic			
Lens Material	PMMA (Polymethyl methacrylate)			
Shock/Vibration	EC 69047-5-2/7.4			
Tightening Torque	0.5 N•m [0.37 lb•ft] for mounting			
Weight	0.035 kg [0.077 lb]	0.031 kg [0.068 lb]		0.03 kg [0.066 lb]
Connectors	4-pin M12 quick-disconnect, Rotates 270°			
IO Link	IO-Link v1.1			
Accessories	Mounting brackets available	Reflectors and mounting brackets available		Mounting brackets available
Agency Approvals**	UL E189727, CE			

* LO/DO antivalent (complementary N.O./N.C.) outputs

** To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

OPT Series Photoelectric Sensors

Detection Range / Sensing Distance

OPT2147, OPT2148 (Diffuse With Background Suppression)

Detection Range	50mm [1.97 in]	100mm [3.94 in]	200mm [7.87 in]
Light Spot Diameter	7mm [0.28 in]	7mm [0.28 in]	5mm [0.20 in]

OPT2149, OPT2150 (Diffuse With Background Suppression)

Detection Range	60mm [2.36 in]	250mm [9.84 in]	500mm [19.69 in]
Light Spot Diameter	11mm [0.43 in]	13mm [0.51 in]	15mm [0.59 in]

OPT2153, OPT2154 (Diffuse With Background Suppression)

Detection Range	100mm [3.94 in]	600mm [23.62 in]	1200mm [47.24 in]
Light Spot Diameter	14mm [0.55 in]	17mm [0.67 in]	24mm [0.94 in]

OPT2157, OPT2158 Laser (Diffuse With Background Suppression)

Detection Range	65mm [2.55 in]	150mm [5.90 in]	300mm [11.81 in]
Light Spot Diameter	3mm [0.11 in]	2.5 mm [0.09 in]	2mm [0.078 in]

OPT2133, OPT2134 (Retro-Reflex)

Distance, Sensor to Reflector	1.5 m [4.92 ft]	3.5 m [11.48 ft]	7m [22.97 ft]
Smallest Recognizable Part	10mm [0.39 in]	6mm [0.24 in]	15mm [0.59 in]
Light Spot Diameter	60mm [2.36 in]	120mm [4.72 in]	250mm [9.84 in]

OPT2135, OPT2136 (Laser Retro-Reflex)

Distance, Sensor to Reflector	2m [6.5 ft]	5m [16.40 ft]	9.5 m [31.16 ft]
Smallest Recognizable Part	0.75 mm [0.02 in]	5mm [0.19 in]	8mm [0.31 in]
Light Spot Diameter	20mm [0.79 in]	50mm [1.97 in]	70mm [2.75 in]

OPT2137, OPT2138 (Retro-Reflex)

Distance, Sensor to Reflector	2m [6.5 ft]	5.5 m [18.04 ft]	11m [36.09 ft]
Smallest Recognizable Part	40mm [1.57 in]	20mm [0.79 in]	30mm [1.18 in]
Light Spot Diameter	120mm [4.72 in]	270mm [10.63 in]	500mm [19.69 in]

OPT2139, OPT2140 (Retro-Reflex for Clear Glass Detection)

Distance, Sensor to Reflector	0.5 m [1.64 ft]	1.3 m [4.27 ft]	2.6 m [8.53 ft]
Smallest Recognizable Part	1.5 mm [0.06 in]	4mm [0.16 in]	15mm [0.59 in]
Light Spot Diameter	30mm [1.18 in]	45mm [1.77 in]	80mm [3.15 in]

OPT2130, OPT2131 (Through-Beam)

Distance, Transmitter to Receiver	4m [13.12 ft]	10m [32.81 ft]	20m [65.62 ft]
Smallest Recognizable Part	6mm [0.24 in]	2mm [0.08 in]	2.5 mm [0.10 in]

Accessories for OPT Series 50x50mm Photoelectric Sensors

Right-angle Brackets

Mounting bracket, right-angle, nickel-plated steel or 304 stainless steel.
For use with OPT series 50x50mm photoelectric sensors.

Accessories for OPT Series 50x50mm Photoelectric Sensors				
Part Number	Price	Description	Drawing Link	Weight [lb]
OPT2031	\$7.00	Wenglor mounting bracket, right-angle, nickel-plated brass. For use with OPT series 50x50mm photoelectric sensors.	PDF	0.24
OPT2038	\$11.00	Wenglor mounting bracket, right-angle, vertical and horizontal adjustment, 304 stainless steel. For use with OPT series 50x50mm photoelectric sensors.	PDF	0.19



[OPT2031](#)



[OPT2038](#)

Accessories for OPT Series 50x50mm Photoelectric Sensors

Right-angle Swivel Mounting Systems

Mounting bracket, right-angle swivel, 360 degree vertical and horizontal adjustment, 12mm rod mount. For use with OPT series 50x50mm photoelectric sensors. Available in all stainless steel or with an aluminum head with a stainless steel mounting plate.

Accessories for OPT Series 50x50mm Photoelectric Sensors						
Part Number	Price	Description	Mounting Head	Mounting Plate	Drawing Link	Weight [lb]
<u>OPT2122</u>	\$11.50	Wenglor mounting bracket, right-angle swivel, 360 degree vertical and horizontal adjustment, aluminum, 12mm rod mount. For use with OPT series 50x50mm photoelectric sensors.	Aluminum	304 Stainless Steel	<u>PDF</u>	0.19
<u>OPT2123</u>	\$21.00	Wenglor mounting bracket, right-angle swivel, 360 degree vertical and horizontal adjustment, 304 stainless steel, 12mm rod mount. For use with OPT series 50x50mm photoelectric sensors.	304 Stainless Steel	304 Stainless Steel	<u>PDF</u>	0.31

NOTE:

304 Stainless steel mounting rods sold separately: [OPT2109](#) (200mm length), [OPT2110](#) (300mm length), and [OPT2111](#) [500mm length].



[OPT2122,](#)
[OPT2123](#)

Mounting Rods and Brackets

Mounting Rods

304 Stainless steel rods for mounting swivel brackets [OPT2112](#) - [OPT2127](#). Available in three lengths: 200mm, 300mm, and 500mm. 12mm diameter.

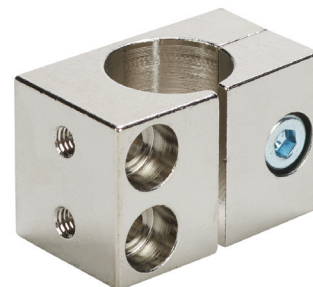
Mounting Rods for OPT2112-2127 Swivel Mounting Brackets				
Part Number	Price	Description	Drawing Link	Weight lb (g)
OPT2109	\$13.00	Wenglor mounting rod, 12mm diameter, 200mm length, 304 stainless steel.	PDF	0.41 [185.97]
OPT2110	\$16.00	Wenglor mounting rod, 12mm diameter, 300mm length, 304 stainless steel.	PDF	0.60 [272.16]
OPT2111	\$21.00	Wenglor mounting rod, 12mm diameter, 500mm length, 304 stainless steel.	PDF	0.98 [444.52]



Right-angle Mounting Bracket

Mounting bracket, right-angle, nickel-plated brass. For use with 12mm mounting rods [OPT2109](#), [OPT2110](#) & [OPT2111](#).

Right-angle Mounting Brackets for 12mm Sensors				
Part Number	Price	Description	Drawing Link	Weight lb [g]
OPT2108	\$16.00	Wenglor mounting bracket, right-angle, nickel-plated brass. For use with 12mm mounting rods OPT2109, OPT2110 & OPT2111.	PDF	0.07 [31.8]



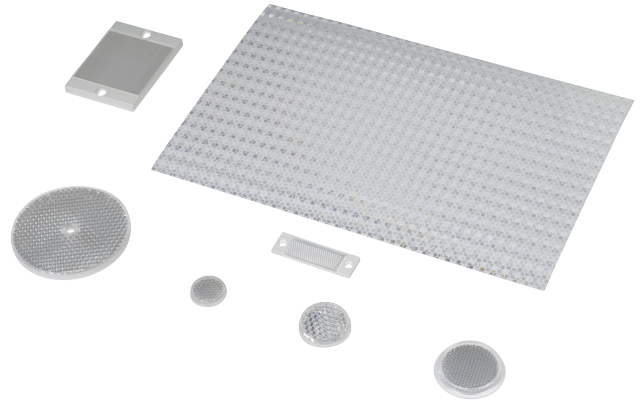
Reflectors

RL Series Reflectors for Polarized Reflective Photoelectric Sensors (All Models)

- Suitable for use with polarized light photoelectric sensors
- Shapes and sizes for most applications
- Miniature types for close mounting in multiple sensor installations
- Single hole, dual hole and self-adhesive mounting types available
- Single and 10-packs available

Installation Notes

- Keep the reflector surface clean to ensure peak detection performance. This is especially true when the maximum sensing range is being used. Clean using a damp cloth.
- When selecting a reflector, it is important to consider the ambient conditions it will be exposed to. Dusty or high humidity conditions may reduce the sensing range as much as 90%.
- Reflectors should be positioned at a 90° angle to the optical axis with a tolerance of $\pm 15^\circ$.



Reflector Specifications							
Part number	Price	Drawing Link	Quantity	Dimensions mm [in]	Degree of Protection	Mounting	Materials
RL102	\$38.00	PDF	10	25	IEC IP67	Customer-supplied adhesive or other mounting method required	Reflective face: PMMA Polymethylmethacrylate (acrylic) Base material: ABS (Acrylonitrile-butadiene-styren)
RL102-1	\$4.25		1	[0.98]			
RL103	\$42.50	PDF	10	34.5			
RL103-1	\$4.75		1	[1.36]			
RL104	\$42.50	PDF	10	46			
RL104-1	\$4.75		1	[1.81]			
RL105G	\$38.00	PDF	10	95 x 38		Two 4.3 mm holes	
RL105G-1	\$4.25		1	[3.74 x 1.50]			
RL106G	\$42.50	PDF	10	182 x 42		Two 6mm holes	
RL106G-1	\$4.75		1	[7.17 x 1.65]			
RL110	\$19.00	PDF	10	84		One 5mm hole	
RL110-1	\$2.00		1	[3.31]			
RL116	\$19.00	PDF	10	41 x 60		Two 3mm holes	
RL116-1	\$2.00		1	[3.54 x 2.36]			
RL100DA4	\$38.50	NA	1	200 x 300		Self-adhesive	Paper (Acrylic tape with micro prism)
RL100DC4	\$12.00	NA	1	50 x 300			
RL100DQ1	\$8.75	NA	1	100 x 100			
RL111G	\$60.00	PDF	10	22.5 x 47		Two 3mm slots	Reflective face: PMMA Polymethylmethacrylate (acrylic) Base material: ABS (Acrylonitrile-butadiene-styren)
RL111G-1	\$7.25		1	[0.89 x 1.85]			
RL112G	\$44.00	PDF	10	19 x 73			
RL112G-1	\$4.75		1	[0.75 x 2.87]			
RL113G	\$53.00	PDF	10	51.4 x 60.3		Two 4mm slots	
RL113G-1	\$6.00		1	[2.02 x 2.37]			

Not recommended for applications involving moist air environments or water immersion.

Reflectors

RL Series Reflectors for Polarized Reflective Laser Photoelectric Sensors (FALN series)

- Suitable for use with polarized light laser photoelectric sensors
- Sizes for most applications
- Miniature types for close mounting in multiple sensor installations
- Single and 5-packs available

Specifications						
Part Number	<i>RL201</i>	<i>RL201-1</i>	<i>RL203</i>	<i>RL203-1</i>	<i>RL204</i>	<i>RL204-1</i>
Price	\$38.00	\$8.25	\$35.50	\$7.75	\$30.00	\$6.75
Quantity	5	1	5	1	5	1
Drawing Link	PDF		PDF		PDF	
Dimensions	60 x 82 mm 2.36 x 3.23 in		19 x 6mm 0.75 x 2.36 in		20mm x 32mm 0.80 in x 1.26 in	
Degree of Protection ¹	IEC IP67					
Mounting	Two 0.4 mm holes		Two 0.4 mm holes		Two 0.3 mm holes	
Materials	Acrylic/polycarbonate					

¹ Not recommended for applications involving moist air environments or water immersion.

Reflectors

Reflectors for Photoelectric Laser Sensors

Reflectors for OPT Series Photoelectric Sensors				
Part Number	Price	Description	Drawing Link	Weight lb [g]
OPT2030	\$14.00	Reflector, square, 100 x 100mm. For use with photoelectric laser sensors.	PDF	0.20 [90.71]
OPT2167	\$13.50	Wenglor reflector, rectangular, 61 x 51.5mm. For use with OPT2137 & OPT2138.	PDF	0.03 [13.60]

Note: [OPT2015](#) requires purchase of [OPT2030](#) reflector. <50m sensing distance requires 1 reflector. 50–100 m sensing distance requires 4 reflectors.



[OPT2167](#)



[OPT2030](#)