



M12 Metal Photoelectric Sensors



LTR-M12MA-PMK-603
LTR-M12MA-PMS-101

M12 (12mm) metal – DC

- Diffuse, retroreflective, through-beam styles
- Axial cable or M12 quick-disconnect models; purchase cable separately
- Complete overload protection
- IP67 rated
- 2-year warranty
- IO-Link v1.0 on PNP models



M12 Metal Photoelectric Sensors									
Part Number	Price	Sensing Range	Switching Frequency	Light Type	Logic	Output Function	Connection Type	Wiring	Drawing Link
Diffuse reflective									
LTR-M12MA-PMK-603	\$40.50	5-800mm [0.196 - 31.49 in]	1.5 kHz	Visible red	PNP	Complementary Light-on / Dark-on	4-wire pigtail	2	PDF
LTR-M12MA-PMK-101	\$40.50	5-800mm [0.196 - 31.49 in]	1.5 kHz	Visible red	NPN		4-wire pigtail	1	PDF
LTR-M12MA-PMS-603	\$40.50	5-800mm [0.196 - 31.49 in]	1.5 kHz	Visible red	PNP		4-pin M12 quick-disconnect	2	PDF
LTR-M12MA-PMS-101	\$40.50	5-800mm [0.196 - 31.49 in]	1.5 kHz	Visible red	NPN		4-pin M12 quick-disconnect	1	PDF
*Retroreflective sensor									
LRR-M12MA-NMK-603	\$45.50	0.15-4m [0.005 -13.12 ft]	1.5 kHz	Visible red	PNP	Complementary Light-on / Dark-on	4-wire pigtail	2	PDF
LRR-M12MA-NMK-101	\$45.50	0.15-4m [0.005 -13.12 ft]	1.5 kHz	Visible red	NPN		4-wire pigtail	1	PDF
LRR-M12MA-NMS-603	\$45.50	0.15-4m [0.005 -13.12 ft]	1.5 kHz	Visible red	PNP		4-pin M12 quick-disconnect	2	PDF
LRR-M12MA-NMS-101	\$45.50	0.15-4m [0.005 -13.12 ft]	1.5 kHz	Visible red	NPN		4-pin M12 quick-disconnect	1	PDF
*Purchase reflector separately									
Through-beam emitters									
LLR-M12MA-NMK-400	\$27.50	0-10m [0 - 32.80 ft]	1 kHz	Visible red	N/A	N/A	4-wire pigtail	3	PDF
LLR-M12MA-NMS-400	\$27.50	0-10m [0 - 32.80 ft]	1 kHz	Visible red	N/A	N/A	4-pin M12 quick-disconnect	3	PDF
Through-beam receivers									
LLR-M12MA-NMK-603	\$38.00	0-10m [0 - 32.80 ft]	1 kHz	N/A	PNP	Complementary Light-on / Dark-on	4-wire pigtail	2	PDF
LLR-M12MA-NMK-101	\$38.00	0-10m [0 - 32.80 ft]	1 kHz	N/A	NPN		4-wire pigtail	1	PDF
LLR-M12MA-NMS-603	\$38.00	0-10m [0 - 32.80 ft]	1 kHz	N/A	PNP		4-pin M12 quick-disconnect	2	PDF
LLR-M12MA-NMS-101	\$38.00	0-10m [0 - 32.80 ft]	1 kHz	N/A	NPN		4-pin M12 quick-disconnect	1	PDF

Warning: These products are not safety sensors and are not suitable for use in personal safety applications.

Wiring Diagrams

Diagram 1
4-Wire NPN Output

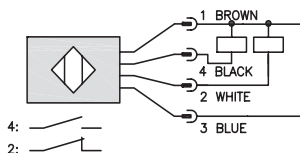


Diagram 2
4-Wire PNP Output

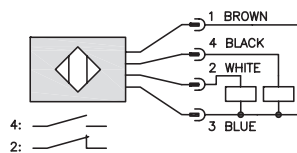
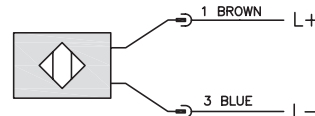
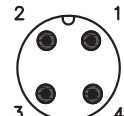


Diagram 3
Emitter



M12 connector





M12 Metal Photoelectric Sensors Specifications



M12 Metal Photoelectric Sensors Specifications			
Sensor type	Diffuse reflective (LTR)	Retroreflective (LRR)	Through-Beam (LLR)
Sensing Distance ¹	5-800mm [0.196 - 31.49 in]	0.15-4m [0.005 - 13.12 ft]	0-10m [0 - 32.80 ft]
Operating Range	6 - 650 mm [0.23 - 25.59 in]	20 - 3,200 mm [0.78 - 125.98 in]	0 - 8000 mm [0 - 314.96]
Light Spot Diameter (Distance)	15mm - [0.3 m] 25mm - [0.6 m]	20mm [0.5 m] 80mm [2m]	6mm [2m] 15mm [5m]
Emission	LED, red 645nm	LED, red 645nm	LED, red 630nm
Sensitivity	90 - 800 mm, 3/4 turn pot	500 - 4,000 mm I/O-Link only	2,000 - 10,000 mm, IO-Link only
Output Types	NPN or PNP		
Operating Voltage	10-30VDC		
No Load Supply Current	≤ 15mA	≤ 15mA	≤ 10mA
Operating (Load) Current	≤ 200mA		
Response Time ¹	≤ 300ms (normal) / ≤ 1ms / ≤ 100μs	≤ 300ms (normal) / ≤ 1ms / ≤ 100μs	≤ 500s (normal) / ≤ 1ms / ≤ 250μs
Switching Frequency ¹	≤ 700Hz (normal) ≤ 450Hz / ≤ 1kHz	≤ 1.5 kHz (normal) ≤ 500Hz / ≤ 5kHz	≤ 1kHz (normal) / ≤ 500Hz / ≤ 2kHz
Ripple	10%Vpp		
Voltage Reversal Protection	Yes		
Short-circuit Protection	Yes		
Operating Temperature	-25 to 65°C [-13 to 149°F]		
Protection Degree	IP67		
LED Indicators - Switching Status	Green LED: excess gain; Yellow LED: sensing state		
Housing Material	Chrome plated brass		
Lens Material	PMMA - Poly (methyl methacrylate)		
Shock/Vibration	IEC 60947-5-2		
Tightening Torque	1 N•m [0.73 lb•ft]		
Weight	14.3 g [0.50 oz] Connector version 79g [2.79 oz] Cable version		
IO-Link	IO-Link v1.0, PNP units only		
Connectors	PVC, 2m [6.5 ft] 3-wire or 4-wire; 4-pin M12 quick-disconnect		
Agency Approvals	cULus, CE		

¹By default, "Normal" mode. "Fine" and "Fast" modes selectable via IO-Link.

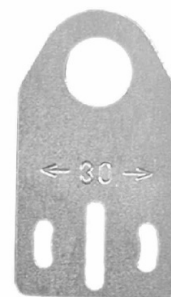
To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

Accessories for 12mm Sensors

Axial Mounting Bracket

Mounting bracket, axial, available in zinc-plated steel or 316L stainless steel. For use with 12mm sensors. Has two mounting holes (use 3mm screws) and allows the rotation of an optical axis for right-angle adapter sensors. Hexagonal nuts not included.

Accessories for 12mm Sensors				
Part Number	Price	Description	Drawing Link	Weight lb [g]
<u>ST12A</u>	\$2.00	Micro Detectors mounting bracket, axial, zinc plated steel. For use with 12mm sensors.	<u>PDF</u>	0.03 [13.6]
<u>ST12A7W</u>	\$7.25	Micro Detectors mounting bracket, axial, 316L stainless steel. For use with 12mm sensors.	<u>PDF</u>	0.03 [13.6]



[ST12A](#)

Right-angle Mounting Bracket

Mounting bracket, right-angle, zinc-plated steel or 316L stainless steel. For use with 12mm sensors. Has two mounting holes (use 3mm screws) and allows the rotation of an optical axis for axial sensors. Hexagonal screws not included.

Accessories for 12mm Sensors				
Part Number	Price	Description	Drawing Link	Weight lb [g]
<u>ST12C</u>	\$2.00	Micro Detectors mounting bracket, right-angle, zinc plated steel. For use with 12mm sensors.	<u>PDF</u>	0.03 [13.6]
<u>ST12C7W</u>	\$7.25	Micro Detectors mounting bracket, right-angle, 316L stainless steel. For use with 12mm sensors.	<u>PDF</u>	0.03 [13.6]



[ST12C](#)

Accessories for 12mm Sensors

Right-angle Mounting Brackets

Mounting bracket, right-angle, fixed insertion stop adjustment, plastic. For use with 12mm sensors. Available with or without fixed insertion stop.

Accessories for 12mm Sensors				
Part Number	Price	Description	Drawing Link	Weight lb [g]
OPT2102	\$8.00	Wenglor mounting bracket, right-angle, fixed insertion stop adjustment, plastic. For use with 12mm sensors.	PDF	0.05 [22.7]
OPT2103	\$8.00	Wenglor mounting bracket, right-angle, plastic. For use with 12mm sensors.	PDF	0.05 [22.7]



[OPT2102](#), [OPT2103](#)

Right-angle Swivel Mounting Systems

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

Accessories for 12mm Sensors						
Part Number	Price	Description	Mounting Head	Mounting Plate	Drawing Link	Weight lb [g]
OPT2114	\$11.50	Wenglor mounting bracket, right-angle swivel, 360 degree vertical and horizontal adjustment, aluminum, 12mm rod mount. For use with 12mm sensors.	Aluminum	Stainless steel	PDF	0.14 [63.5]
OPT2115	\$21.00	Wenglor mounting bracket, right-angle swivel, 360 degree vertical and horizontal adjustment, 304 stainless steel, 12mm rod mount. For use with 12mm sensors.	304 Stainless steel	304 Stainless steel	PDF	0.27 [122.5]

Note: 304 stainless steel mounting rods sold separately: [OPT2109](#) (200mm [7.87 in] length), [OPT2110](#) (300mm [11.81 in] length), and [OPT2111](#) (500mm [19.69 in] length).



[OPT2114](#), [OPT2115](#)

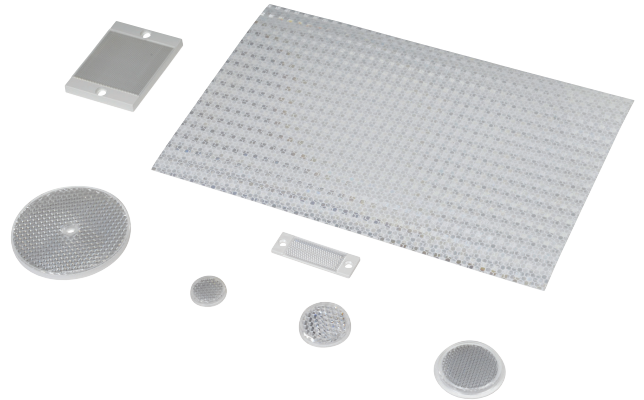
Reflectors

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.