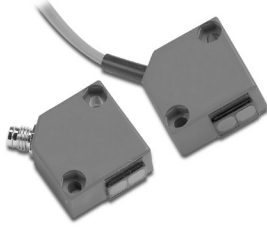# CX Series Photoelectric Sensors

Mini-rectangular plastic - DC

- 18 models available
- Long operating distances
- Adjustable sensitivity
- Scratch-resistant and easy to clean glass lens
- Axial cable or M8 quick-disconnect models
- Complete overload protection
- Mounting brackets are not needed
- IP65 rated

NEED CABLES?

CX Series Mini-Rectangular Photoelectric Sensors Selection Chart

Part Number	Price		Sensing Range	Output State	Logic	Connection	Wiring	Dimensions	Characteristic Curves
Diffuse									
CX3-AN-1A	$48.50		Up to 600 mm (23.62 in)	N.O.	NPN	2 m (6.5') axial cable	Diagram 1	Figure 1	Chart 1
CX3-AP-1A	$48.50				PNP	2 m (6.5') axial cable	Diagram 2	Figure 1	Chart 1
CX3-AN-1F	$48.50				NPN	M8 (8 mm) connector	Diagram 1	Figure 2	Chart 1
CX3-AP-1F	$48.50				PNP	M8 (8 mm) connector	Diagram 2	Figure 2	Chart 1
Diffuse with background suppression									
CX5-AN-1A	$65.00		15-150 mm (0.59 to 5.91 in)	N.O.	NPN	2 m (6.5') axial cable	Diagram 1	Figure 1	Chart 2
CX5-AP-1A	$65.00				PNP	2 m (6.5') axial cable	Diagram 2	Figure 1	Chart 2
CX5-AN-1F	$65.00				NPN	M8 (8 mm) connector	Diagram 1	Figure 2	Chart 2
CX5-AP-1F	$65.00				PNP	M8 (8 mm) connector	Diagram 2	Figure 2	Chart 2
Polarized reflective*									
CXP-AN-1A	$51.00		Up to 2 m (6.6 ft)	N.O.	NPN	2 m (6.5') axial cable	Diagram 1	Figure 1	Chart 3
CXP-AP-1A	$51.00				PNP	2 m (6.5') axial cable	Diagram 2	Figure 1	Chart 3
CXP-AN-1F	$51.00				NPN	M8 (8 mm) connector	Diagram 1	Figure 2	Chart 3
CXP-AP-1F	$51.00				PNP	M8 (8 mm) connector	Diagram 2	Figure 2	Chart 3
Through-beam**									
CXR-AN-1A	Receiver	$48.50	Up to 6 m (19.7 ft)	N.O.	NPN	2 m (6.5') axial cable	Diagram 1	Figure 1	Chart 4
CXR-AP-1A	Receiver	$48.50			PNP	2 m (6.5') axial cable	Diagram 2	Figure 1	Chart 4
CXR-AN-1F	Receiver	$48.50			NPN	M8 (8 mm) connector	Diagram 1	Figure 2	Chart 4
CXR-AP-1F	Receiver	$48.50			PNP	M8 (8 mm) connector	Diagram 2	Figure 2	Chart 4
CXE-0N-1A	Emitter	$30.50		Receiver dependent	Receiver dependent	2 m (6.5') axial cable	Diagram 3	Figure 1	Chart 4
CXE-0N-1F	Emitter	$30.50				M8 (8 mm) connector	Diagram 3	Figure 2	Chart 4

Purchase reflectors separately.

**Purchase one receiver and one emitter for a complete set.*

Switching Element Function

	Thru-beam and Reflective Models	Diffuse Reflective Models
Light on	N.C.	N.O.
Dark on	N.O.	N.C.

Wiring Diagrams

Diagram 1
NPN Output

```
1 BROWN  L+
4 BLACK
3 BLUE   L−
```

Diagram 2
PNP Output

```
1 BROWN  L+
4 BLACK
3 BLUE   L−
```

Diagram 3
Emitter

```
1 BROWN   L+
CHECK
3 BLUE    L−
```
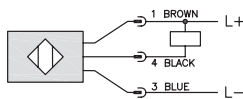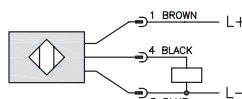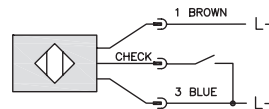
Emitter test input (<4V: OFF / >8V or open: ON) 0.5mA

Connector

M8 connector

```
    4
 1     3
```
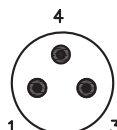
Warning: These products are not safety sensors and are not suitable for use in personal safety applications.

CX Series Photoelectric Sensors

Specifications	Diffuse Models	Diffuse Models with Background Suppression	Reflective Models	Through-beam Models[1]
Type	Diffuse reflection	Diffuse reflection with background suppression	Polarized reflection	Through-beam
Sensing Distance	600mm[2]	15 to 150mm[3]	2m	6m
Light Spot Diameter	See charts			
Emission	IR-LED (880nm)	LED red (660nm)	LED red polarized(660nm)	IR-LED (880nm)
Sensitivity	Adjustable 12-turn pot.			
Output Type	NPN or PNP; N.O. only			
Operating Voltage	10-36VDC			
No Load Supply Current	15mA	25mA	15mA	15mA (R) / 10mA (E)
Operating (Load) Current	≤200mA			
Off-state (Leakage) Current	≤10µA			
Voltage Drop	≤2.0V			
Switching Frequency	1kHz	500Hz	1kHz	1kHz
Ripple	≤20%			
Time Delay Before Availability (tv)	100ms			
Short-Circuit Protection	Yes (switch autoresets after overload is removed)			
Operating Temperature	-25° to + 55°C (-13° to 131°F)			
Protection Degree (DIN 40050)	IEC IP65			
LED Indicators - Switching Status	Yellow (output state, output energized), green (excess light indication)			
Housing Material	PBTP (Crastin)			
Lens Material	Glass			
Shock/Vibration	See terminology section			
Tightening Torque	N/A			
Weight (cable/connector)	84g (2.96 oz)/49g (1.73 oz)			232g (8.40oz)/98g (3.46oz)
Connectors	2m (6.5') axial cable; M8 (8 mm) connector			
Agency Approvals	cULus E32881			

[1]Through-beam sensors must be used in pairs consisting of one receiver and one emitter [2]With 200x200mm white matte paper,
[3]With 100x100mm white matte paper
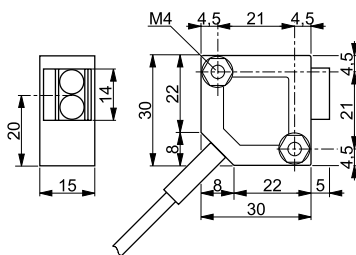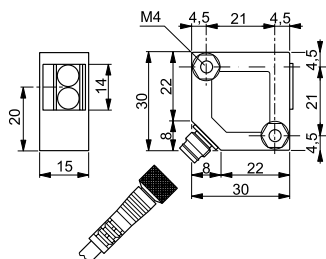
Dimensions

(mm)

Figure 1

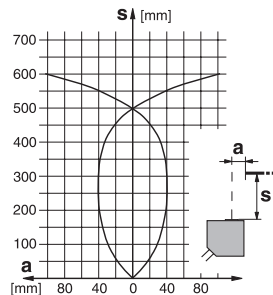**Figure 2**

Characteristic curves

Chart 1 (Diffuse)

Chart 3 (Polarized reflective)

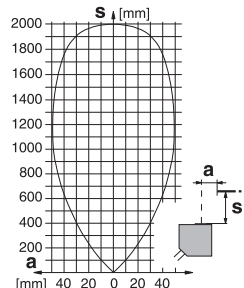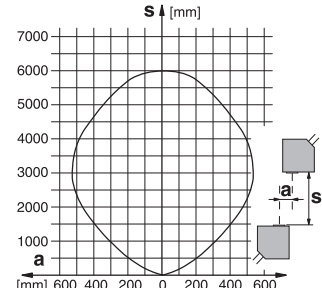## Chart 2 (Diffuse with background suppression)

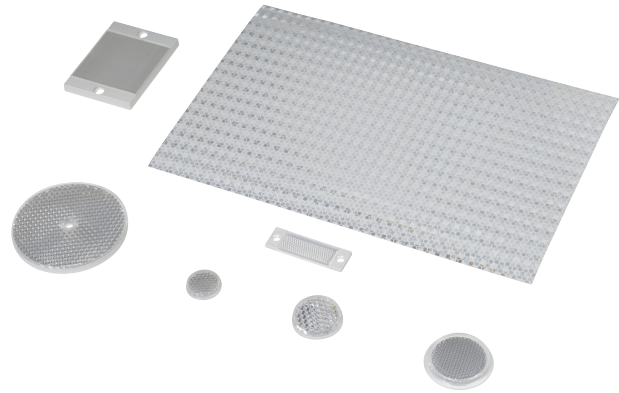
Chart 4 (Through-beam)

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 ±15°.

Specifications						
Model	Price	Quantity	Dimensions	Degree of Protection	Mounting	Materials
RL102	$35.00	10 per pack	25mm [0.98 in]	IEC IP67	Customer-supplied adhesive or other mounting method required	Reflective face: PMMA Polymethylmethacrylate (acrylic) Base material: ABS (Acrylonitrile-butadiene-styren)
RL102-1	$3.75	1 per pack				
RL103	$40.00	10 per pack	34.5 mm [1.36 in]			
RL103-1	$4.25	1 per pack				
RL104	$40.00	10 per pack	46mm [1.81 in]			
RL104-1	$4.25	1 per pack				
RL105	$35.00	10 per pack	90 x 40 mm [3.54 x 1.58 in]		Two 4.3 mm holes	
RL105-1	$3.75	1 per pack				
RL106G	$40.00	10 per pack	182 x 42 mm [7.17 x 1.65 in]		Two 6mm holes	
RL106G-1	$4.25	1 per pack				
RL110	$18.00	10 per pack	84mm [3.31 in]		One 5mm hole	
RL110-1	$2.00	1 per pack				
RL116	$18.00	10 per pack	41 x 60 mm [3.54 x 2.36 in]		Two 3mm holes	
RL116-1	$2.00	1 per pack				
RL100DA4	$32.50	1 per pack	200 x 300 mm [7.87 x 11.81 in]		Self-adhesive	Paper (Acrylic tape with micro prism)
RL100DC4	$10.00	1 per pack	50 x 300 mm [1.97 x 11.81 in]			
RL100DQ1	$7.50	1 per pack	100 x 100 mm [3.94 x 3.94 in]			
RL111G	$52.00	10 per pack	22.5 x 47 mm [0.89 x 21.85 in]		Two 3mm slots	Reflective face: PMMA Polymethylmethacrylate (acrylic) Base material: ABS (Acrylonitrile-butadiene-styren)
RL111G-1	$6.00	1 per pack				
RL112G	$40.00	10 per pack	19 x 73 mm [0.75 x 2.87 in]			
RL112G-1	$4.25	1 per pack				
RL113G	$46.00	10 per pack	51.4 x 60.3 mm [2.02 x 2.37 in]		Two 4mm slots	
RL113G-1	$5.00	1 per pack				

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						
Model	RL201	RL201-1	RL203	RL203-1	RL204	RL204-1
Price	$32.00	$7.00	$30.00	$6.50	$26.00	$5.75
Quantity (per package)	5	1	5	1	5	1
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					

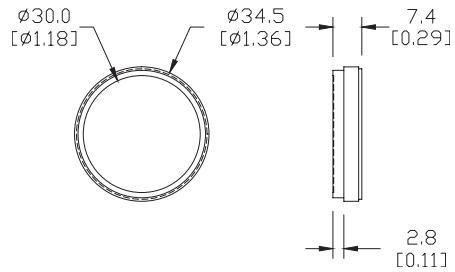[1] Not recommended for applications involving moist air environments or water immersion.
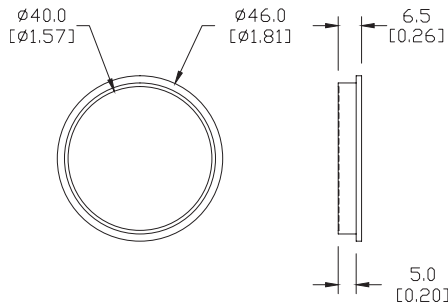
Dimensions

mm [inches]

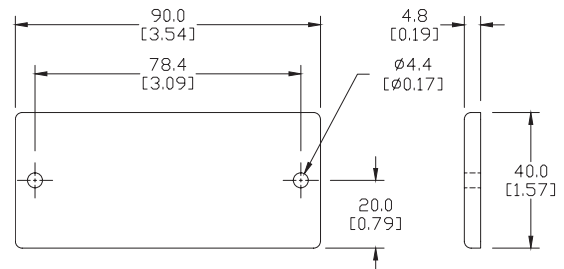**RL102/RL102-1**
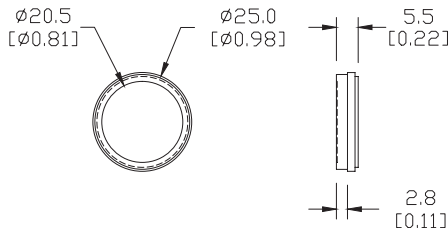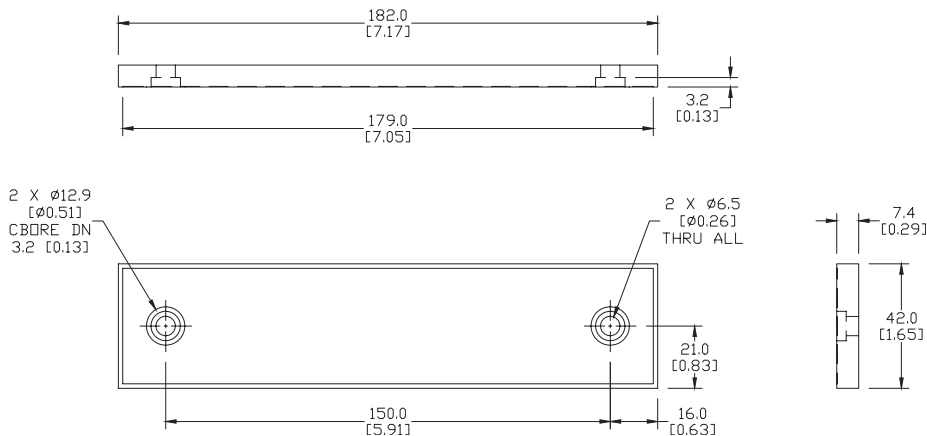

RL103/RL103-1

RL104/RL104-1

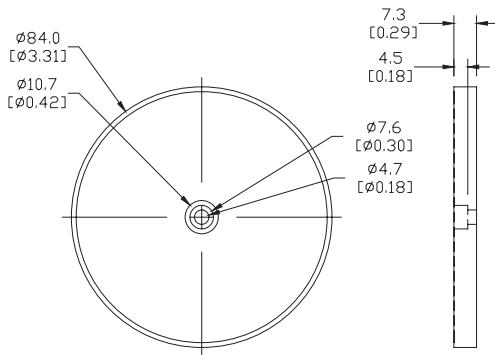**RL105/RL105-1**

RL106G/RL106G-1

See our website: www.AutomationDirect.com for complete engineering drawings
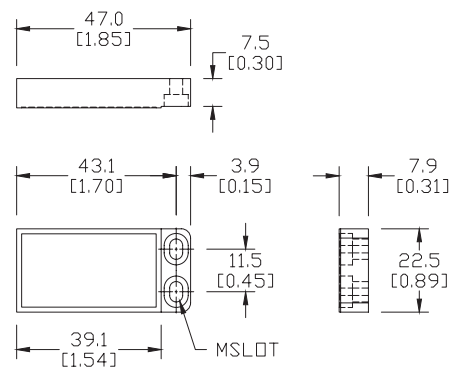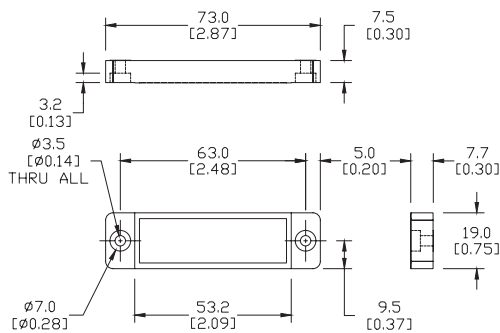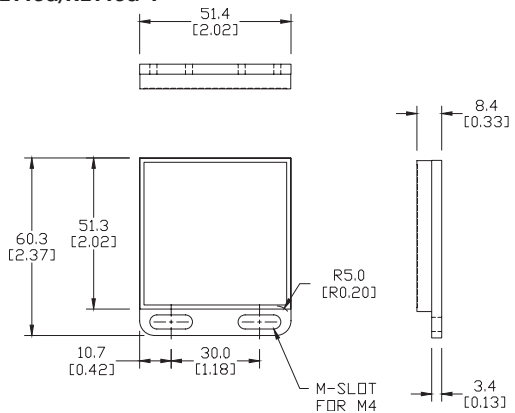
Reflectors

Dimensions
mm [inches]

RL110/RL110-1

ø84.0 [ø3.31]
ø10.7 [ø0.42]
ø7.6 [ø0.30]
ø4.7 [ø0.18]
7.3 [0.29]
4.5 [0.18]

RL111G/RL111G-1

47.0 [1.85]
7.5 [0.30]
43.1 [1.70]
3.9 [0.15]
7.9 [0.31]
11.5 [0.45]
22.5 [0.89]
39.1 [1.54]
MSLOT

RL112G/RL112G-1

73.0 [2.87]
7.5 [0.30]
3.2 [0.13]
ø3.5 [ø0.14] THRU ALL
63.0 [2.48]
5.0 [0.20]
7.7 [0.30]
19.0 [0.75]
ø7.0 [ø0.28]
53.2 [2.09]
9.5 [0.37]

RL113G/RL113G-1

51.4 [2.02]
8.4 [0.33]
60.3 [2.37]
51.3 [2.02]
R5.0 [R0.20]
10.7 [0.42]
30.0 [1.18]
M-SLOT FOR M4
3.4 [0.13]

RL116/RL116-1

60.0 [2.36]
2 X ø3.5 [ø0.14] THRU ALL
3.5 [0.14]
41.0 [1.61]
4.0 [0.16]
56.0 [2.20]
7.5 [0.30]

RL201/RL201-1

60.0 [2.36]
11.0 [0.43] SYM
7.4 [0.29]
MSLOT FOR M4
60.0 [2.36]
29.9 [1.18]
72.0 [2.83]
5.0 [0.20]
82.0 [3.23]

RL203/RL203-1

0.2 [0.01]
41.0 [1.61]
3.2 [0.13]
2 X ø4.9 [ø0.19]
9.5 [0.37]
19.0 [0.75]
50.0 [1.97]
60.0 [2.36]

RL204/RL204-1

1.0 [0.04]
20.0 [0.79]
3.0 [0.12]
2 X ø3.8 [ø0.15]
10.0 [0.39]
20.0 [0.79]
26.0 [1.02]
32.0 [1.26]

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