SLM Series Slot Sensors

Self-contained opposed-mode sensor pair

OPPOSED

Features

- An easy-to-use, self-contained, opposed-mode sensor pair in a U-shaped housing
- Rugged, sealed, die-cast metal housing is rated IEC IP67 (NEMA 6)
- Easy and economical to mount; molded-in beam guides simplify beam placement
- 8 slot widths from 10 mm to 220 mm for a wide variety of sensing applications
- Current sourcing (PNP), current sinking (NPN), or bipolar (one NPN and one PNP) output, depending on model
- Fast 500-microsecond response time
- Single-turn potentiometer Sensitivity adjustment
- Visible red beam
- Selectable Light Operate (L.O.) or Dark Operate (D.O.) with sealed switch
- Yellow painted finish standard; nickel-plated models also available †

Models

QD Models[1]	Slot Width	Supply Voltage	Output Type
SLM10P6Q	10 mm (0.39")	10 to 30V dc	PNP
SLM10N6Q			NPN
SLM20P6Q	20 mm (0.79")		PNP
SLM20N6Q			NPN
SLM30P6Q	30 mm (1.18")		PNP
SLM30N6Q			NPN
SLM50P6Q	50 mm (1.97")		PNP
SLM50N6Q			NPN
SLM80P6Q	80 mm (3.15")		PNP
SLM80N6Q			NPN
SLM120P6Q	120 mm (4.72")		PNP
SLM120N6Q			NPN
SLM180P6Q	180 mm (7.09")		PNP
SLM180N6Q			NPN
SLM220P6Q	220 mm (8.66")		PNP
SLM220N6Q			NPN

Cabled Models[2]	Slot Width	Supply Voltage	Output Type
SLM10B6	10 mm (0.39")	10 to 30V dc	Bipolar (one NPN and one PNP)
SLM20B6	20 mm (0.79")		
SLM30B6	30 mm (1.18")		
SLM50B6	50 mm (1.97")		
SLM80B6	80 mm (3.15")		
SLM120B6	120 mm (4.72")		
SLM180B6	180 mm (7.09")		
SLM220B6	220 mm (8.66")		

NOTES:

1. QD models listed have 3-pin Pico-style integral QD. A model with a QD connector requires an accessory mating cable; see page 5.
2. Cabled models listed have 2 m (6.5') 4-wire cable. For 9 m (30') cable, add suffix "**W/30**" to the model number (e.g., **SLM10B6 W/30**). For 150 mm (6") PUR pigtail cable with 4-pin threaded Euro-style QD connector, add "**QPMA**" to the model number (e.g., **SLM10B6QPMA**). A model with a QD connector requires an accessory mating cable; see page 5.

† Standard models have yellow painted surface. For models with nickel-plated surface, add the suffix "**N**" to the model number (e.g., **SLM10P6QN**).

See Safety Use Warning on Back Page

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SLM Series Slot Sensors

Overview

The SLM Series Slot Sensor (sometimes called a “fork sensor”) comprises an opposed-mode emitter and its receiver inside a single convenient housing. Opposed-mode sensing is very reliable, and the single, self-contained housing provides easy installation, with no sensor alignment required. In addition, molded-in arrows on the housing show at a glance the position of the beam, simplifying installation placement.

Applications include counting, gear tooth detection, edge detection, part sensing on conveyor rails and belts, position and orientation verification, dimension verification, tool break monitoring, and level monitoring.

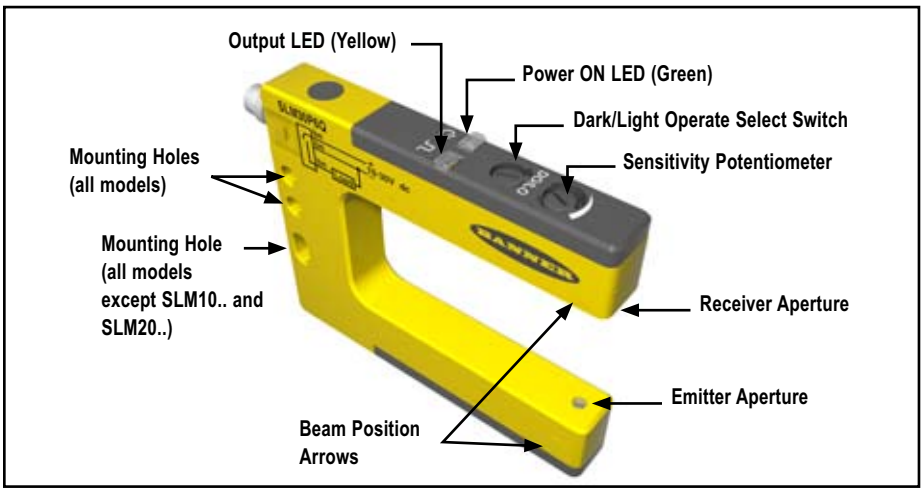

Figure 1. SLM Series features

Sensor Configuration

NOTE: For best results, objects to be detected should be placed midway between the emitter and receiver.

Sensitivity Adjustment

The sensor’s sensitivity is adjusted by turning the 270-degree-turn Sensitivity potentiometer with a small flat-blade screwdriver. Apply power to the sensor and turn the potentiometer all the way clockwise (max. gain). If the object to be sensed does not block the beam at max. gain, turn the gain down a little at a time, testing with the object, until the object can be sensed with reliability.

If adjusting the sensitivity with the potentiometer does not provide reliable object detection, investigate alternative sensing methods.

Light/Dark Operate Select

Select Dark Operate (D.O.) or Light Operate (L.O.) by turning the DO/LO selector switch to the desired setting using a small flat-blade screwdriver. If D.O. is selected, the output conducts when the receiver element does not see the emitted light (object is present). If L.O. is selected, the output conducts when the receiver element sees the emitted light (object is absent).

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Specifications

Slot Opening	10, 20, 30, 50, 80, 120, 180, or 220 mm (depending on model); beam is 5 mm (0.2") from outer edge							
Supply Voltage and Current	10 to 30V dc (10% ripple) @ less than 25 mA, exclusive of load							
Supply Protection Circuitry	Protected against reverse polarity and transient voltages							
Output Configuration	**Cabled and Euro-style QD models:** Bipolar: One current sourcing (PNP) and one current sinking (NPN) **Pico-style QD models:** Current sourcing (PNP) or current sinking (NPN), depending on model							
Output Rating	100 mA with short circuit protection **OFF-state leakage current:** < 10 µA sourcing; < 200 µA sinking **ON-state saturation voltage:** **NPN:** 1.6V @ 100 mA **PNP:** 2.0V @ 100 mA							
Output Protection Circuitry	Protected against output short-circuit and false pulse on power up. 100 ms max. delay at power up; outputs do not conduct during this time.							
	SLM10…	**SLM20…**	**SLM30…**	**SLM50…**	**SLM80…**	**SLM120…**	**SLM180…**	**SLM220…**
Minimum Object Detection* at Max. Gain	1.00 mm (0.040")	1.25 mm (0.050")	1.50 mm (0.060")	1.65 mm (0.065")	1.80 mm (0.070")	1.80 mm (0.070")	1.80 mm (0.070")	2.40 mm (0.095")
Minimum Object Detection* at 2X Excess gain	0.30 mm (0.012")	0.30 mm (0.012")	0.40 mm (0.016")	0.60 mm (0.024")	0.75 mm (0.030")	0.90 mm (0.035")	0.90 mm (0.035")	1.00 mm (0.039")
Hysteresis**	0.10 mm (0.004")	0.10 mm (0.004")	0.10 mm (0.004")	0.10 mm (0.004")	0.20 mm (0.008")	0.20 mm (0.008")	0.20 mm (0.008")	0.20 mm (0.008")
Repeatability***	0.02 mm (0.001")	0.02 mm (0.001")	0.02 mm (0.001")	0.04 mm (0.002")	0.06 mm (0.002")	0.08 mm (0.003")	0.08 mm (0.003")	0.08 mm (0.003")
Output Response Time	500 microseconds							
Repeatability	95 microseconds							
Adjustments	1-turn potentiometer Sensitivity adjustment Light Operate / Dark Operate selection switch							
Indicators	**Two LED Indicators:** Power (green) and Output (yellow) **Green ON steady:** Power ON **Green flashing:** Sensor short circuit **Yellow ON steady:** Output is activated							
Construction	**Housing:** Die-cast zinc with yellow paint; model numbers with suffix "**N**" have nickel plating **Endcaps:** ABS **Optic windows:** acrylic							
Environmental Rating	IEC IP67 (NEMA 6)							
Connections	**Cabled models:** 2 m (6.5') or 9 m (30') 4-conductor, PVC-jacketed cable **Pico-style QD models:** 3-pin, threaded integral QD connector **Euro-style QD models:** 150 mm (6") pigtail (polyurethane) cable with 4-pin, threaded connector							
Operating Conditions	**Temperature:** –20° to +60° C (–4° to +140° F) **Max. Relative Humidity:** 95% @ 55° C (non-condensing)							
Certifications	CE							

***Minimum Object Detection:** Smallest diameter rod that can be detected when passed slowly through sensing beam
NOTE: Minimum object detection is measured midway between the emitter and receiver. For best results, objects to be detected should be placed in the midway position when possible. The minimum object detection size may increase if the object is very close to the receiver side.
****Hysteresis:** Distance an object must move to toggle between output OFF and output ON state
*****Repeatability:** Variation in switching distance for a standard target at controlled sensing conditions

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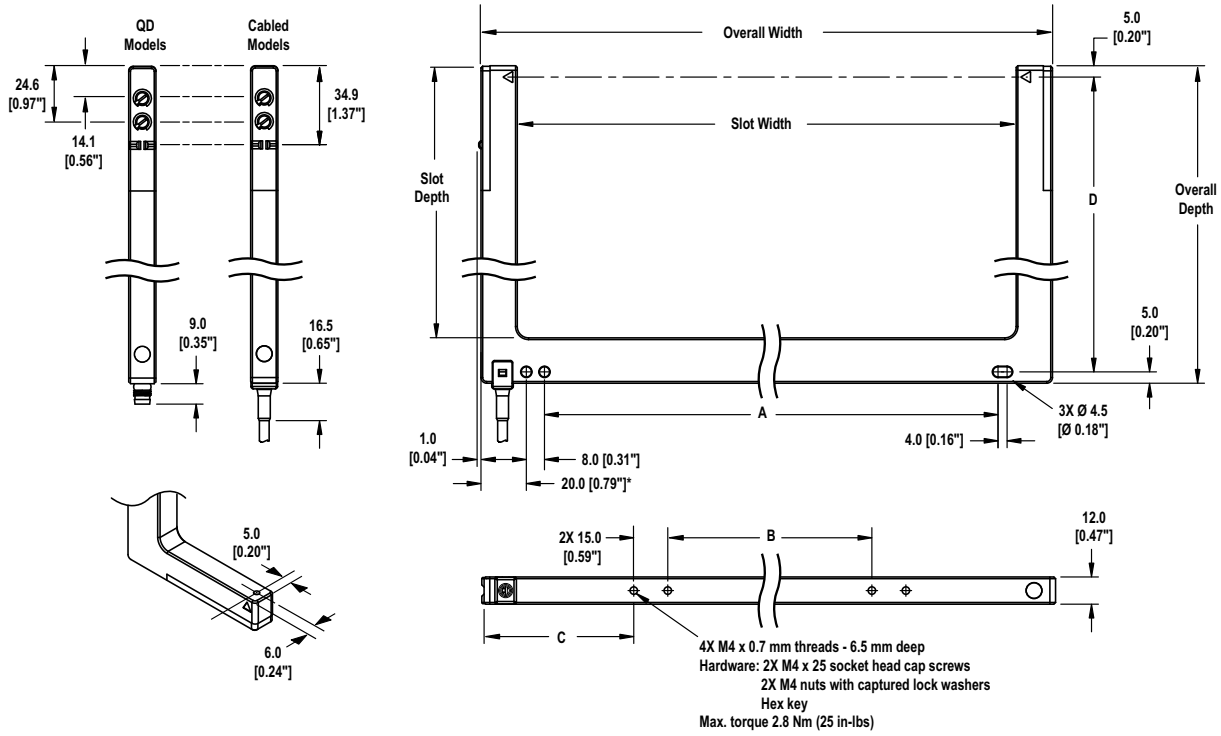
SLM Series Slot Sensors

Dimensions



*Model SLM10.. measures 18.0 [0.71"]

Models	Slot Width	Slot Depth	Overall Width	Overall Depth	A Side Mount	B Back Mount	C	D
SLM10..	10.0 mm (0.39")	60.8 mm (2.39")	42.0 mm (1.65")	80.0 mm (3.15")	n/a	n/a	n/a	70.0 mm (2.76")
SLM20..	20.0 mm (0.79")	60.8 mm (2.39")	52.0 mm (2.05")	80.0 mm (3.15")	n/a	n/a	n/a	70.0 mm (2.76")
SLM30..	30.0 mm (1.18")	60.8 mm (2.39")	62.0 mm (2.44")	80.0 mm (3.15")	10.0 mm (0.39")	n/a	n/a	70.0 mm (2.76")
SLM50..	50.0 mm (1.97")	60.8 mm (2.39")	82.0 mm (3.23")	80.0 mm (3.15")	30.0 mm (1.18")	15.0 mm (0.59")	33.5 mm (1.32")	70.0 mm (2.76")
SLM80..	80.0 mm (3.15")	60.8 mm (2.39")	112.0 mm (4.41")	80.0 mm (3.15")	60.0 mm (2.36")	15.0 mm (0.59")	48.5 mm (1.91")	70.0 mm (2.76")
SLM120..	120.0 mm (4.72")	120.7 mm (4.75")	152.0 mm (5.98")	140.0 mm (5.51")	100.0 mm (3.94")	30.0 mm (1.18")	46.0 mm (1.81")	130.0 mm (5.12")
SLM180..	180.0 mm (7.09")	120.7 mm (4.75")	212.0 mm (8.35")	140.0 mm (5.51")	160.0 mm (6.30")	70.0 mm (2.76")	56.0 mm (2.20")	130.0 mm (5.12")
SLM220..	220.0 mm (8.66")	120.7 mm (4.75")	252.0 mm (9.92")	140.0 mm (5.51")	200.0 mm (7.87")	90.0 mm (3.54")	66.0 mm (2.60")	130.0 mm (5.12")

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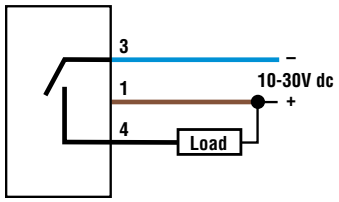
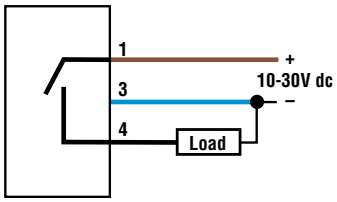
Hookups

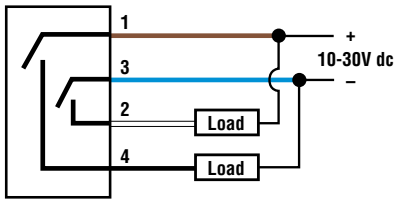
NPN Models



PNP Models



Bipolar Models

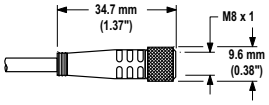
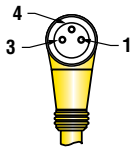
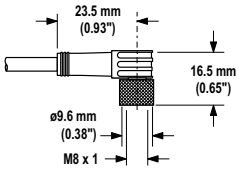
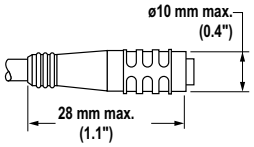
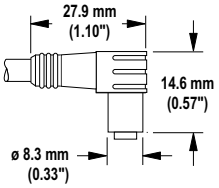
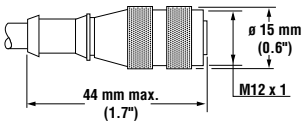
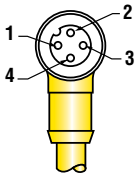
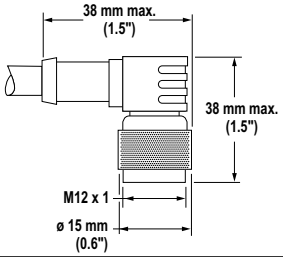


Key

1 = Brown
2 = White
3 = Blue
4 = Black

NOTE: Only QD hookups are shown; cabled hookups are functionally identical.

Quick-Disconnect (QD) Cables

Style	Model	Length	Dimensions	Pinout
3-Pin Threaded Pico-Style, Straight	**PKG3M-2** **PKG3M-9**	2 m (6.5') 9 m (30')		 **Key** 1 = Brown 3 = Blue 4 = Black
3-Pin Threaded Pico-Style, Right-Angle	**PKW3M-2** **PKW3M-9**	2 m (6.5') 9 m (30')		
3-Pin Snap-On Pico-Style, Straight	**PKG3-2**	2 m (6.5')		
3-Pin Snap-On Pico-Style, Right-Angle	**PKW3-2**	2 m (6.5')		
4-Pin Threaded Euro-Style, Straight	**MQDC-406** **MQDC-415** **MQDC-430**	2 m (6.5') 5 m (16') 9 m (30')		 **Key** 1 = Brown 2 = White 3 = Blue 4 = Black
4-Pin Threaded Euro-Style, Right-Angle	**MQDC-406RA** **MQDC-415RA** **MQDC-430RA**	2 m (6.5') 5 m (16') 9 m (30')		

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⚠ WARNING . . . Not To Be Used for Personnel Protection

Never use these products as sensing devices for personnel protection. Doing so could lead to serious injury or death.

These sensors do NOT include the self-checking redundant circuitry necessary to allow their use in personnel safety applications. A sensor failure or malfunction can cause either an energized or de-energized sensor output condition. Consult your current Banner Safety Products catalog for safety products which meet OSHA, ANSI and IEC standards for personnel protection.

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