

Micro Power Inductive Proximity Sensor M3SP1 3-Wire
6 μ A Operating Current + 2.5V DC Industry's Lowest
IP-68 Packaging Waterproof for Underwater Applications



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Quick Selection Guide

Technology:	Inductive. Responsive to metal proximity.	Output Options:	Normally Closed (NC) or Normally Open (NO)
Output Type:	NPN	Connection:	Cable leads. 3-Wire
Sensing Distance:	4 mm	Housing - Body:	Plastic
Supply Voltage:	+2.5V to +16V	Package / Case	ABS
Supply Current:	6 μ A max.	Interface:	None
Shielding	Shielded	Indicator:	None

Description:

LPS (Inductive Proximity Sensor) **M3SP1** series operates at the industry's lowest operating current (6 μ A) level and lowest power supply voltage levels (+2.5V to +16V), making it ideal for portable/battery operated applications. The low minimum operating voltage of +2.5V also makes this sensor directly compatible with most types of computers for portable robotics, motor controls, and automation. Utilizing CMOS IC sensor technology, this sensor provides excellent results, even with difficult-to-detect objects, e.g. small or thin parts, or bright metals. Normally Closed (NC) or Normally Open (NO) sensor output functions are available utilizing NMOS switching.

PATENTED



Features:

- Ultra-low power supply current consumption: 6 μ A max.
- Low power supply voltage: +2.5V to +16V
- Fast start-up time: 20 μ sec.
- Fast response time: 200 μ sec.
- Ingress protection: IP68 waterproof
- Patent No. USA 9,140,579

A joint product with Mirow Sensors Inc.
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Absolute Maximum Ratings

Power Supply Voltage V_{DD}	0 V min.; +17 V max. D.C.
Output Voltage	0 V min.; +30 V max.
Output Current	0.5 A max.
Temperature	-20°C min.; +60°C max.

Specifications: $T_a = +25^\circ\text{C}$ unless otherwise specified

Package / Case	Plastic ABS housing encapsulated with marine grade encapsulant	
Target	24 x 24 x 1 mm Aluminum. See correction factor table below for other metals. Ferrous metal: The sensing distance decreases with ferrous or high permittivity metal.	
Correction Factors ^{Note 1}	Metal	Correction Factors
	Aluminum	1.00
	Copper	0.89
	Brass	0.88
	Stainless steel	0.63
	Iron	0.40
Power supply voltage (Operating Voltage Range)	+2.5 ~ +16 V D.C.	
Power Supply Current Consumption	6 μ A max.	
Output Types ^{note 2}	NC (Normally Closed) or NO (Normally Open)	
Shielding	Shielded	
Output Voltage	27V max.	
Output Leakage Current	2 μ A max.	
Output Load Current	250 mA max.	
Output Voltage Drop	0.4 V max.	

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Sensing Distance^{note 3}	4 mm \pm 10% at +25°C
Response Frequency	5 KHz (200 μ sec.) typical
Start-up Time	20 μ sec. typical
Hysteresis	Yes
Protection Circuit	No
Ambient Humidity	To 100%
Temperature Influence	\pm 5% typical over +15°C to +50°C Referenced to sensing distance at +23°C
Supply Voltage Influence	\pm 1% max. of sensing distance in rated voltage range
Operating Temperature Range	+10°C to +50°C
Storage Temperature Range	-40°C to 50°C (with no icing)
Ingress Protection	IP68. Housing interior is encapsulated with marine grade encapsulant
Housing Properties	Material: ABS (Acrylonitrile Butadiene Styrene) Color: Black RoHS: RoHS Compliant Electrical: Arc resistance (PLC). PLC7 Flammability: Rating UL. V-0
Termination Style	Pre-wired. 2 m cable leads. 3 conductors. 26 AWG. Conductor strand: 7/34.
Indicator	No indicator

Note 1 Correction Factors -A percentage of the rated operating distance (AI) that represents the operating distance for targets constructed from materials other than Aluminum. Deviations may be due to variations in the oscillator frequency, alloy compositions, purity & target geometry.

Note 2 Normally Closed ("NC"): The output is **OFF** when the target is detected by the sensor.
Normally Open ("NO"): The output is **ON** when the target is detected by the sensor.

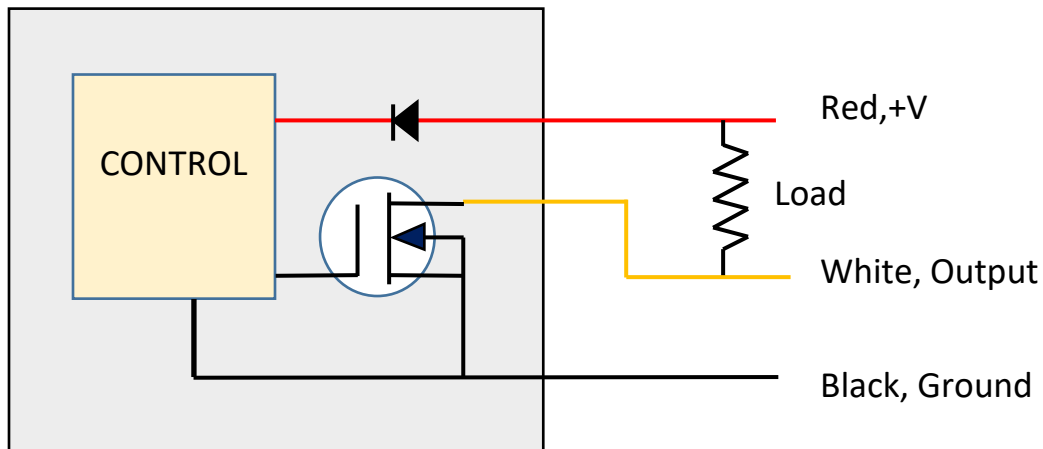
Note 3 Sensing Distance: A distance at which the target approaching the sensing face, along the reference axis, causes the output signal to change.

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Wiring Diagram:



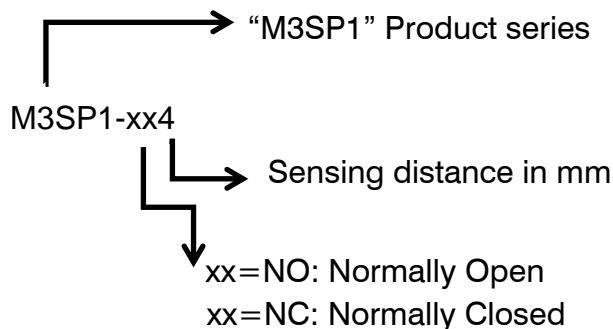
How to Order:

Orderable Code	Description
M3SP1-NO4	Normally Open
M3SP1-NC4	Normally Closed

Part Number Explanation:

Normally Open: M3SP1-NO4

Normally Closed: M3SP1-NC4

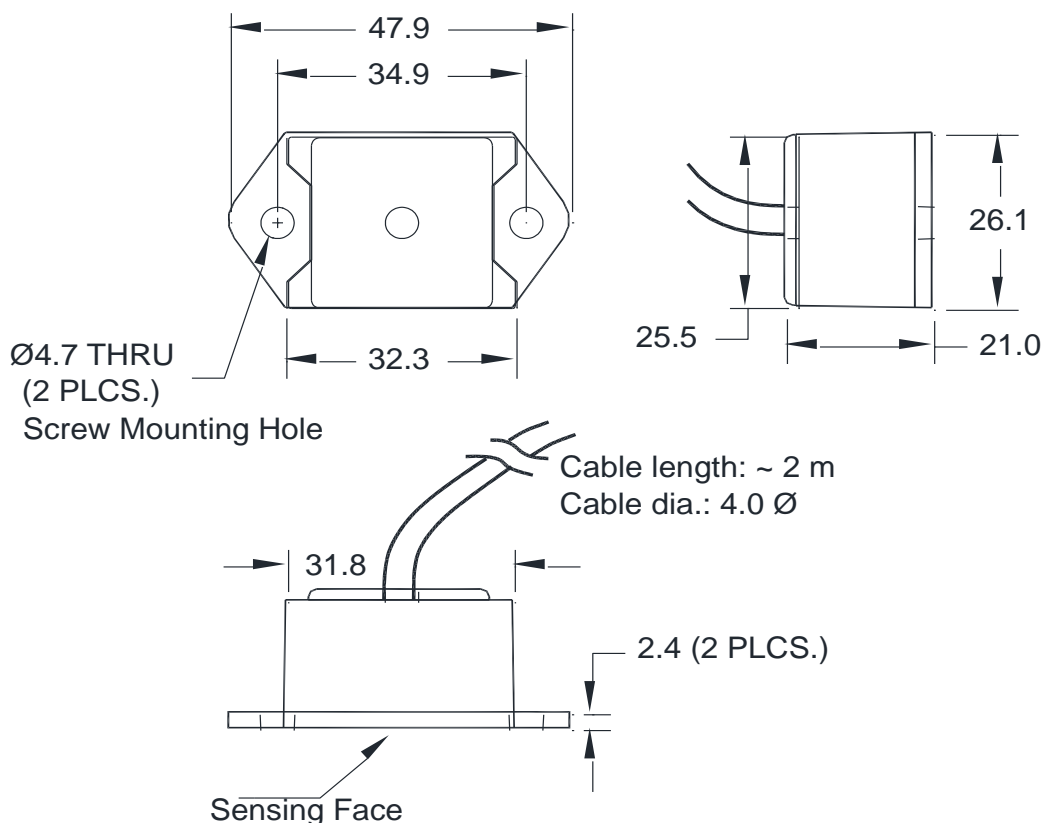


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Dimensions Unit: mm



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