Installation Instructions
Ultrasonic Analog Sensors

IMPORTANT: SAVE THESE INSTRUCTIONS FOR FUTURE USE.

Specifications

General	300 mm Models	800 mm Models
Sensing range [mm (in.)]	30…300 (1.18…11.81)	50…800 (1.96…31.49)
Adjustment range [mm (in.)]	50…300 (1.96…11.81)	70…800 (2.75…31.49)
Blind zone [mm (in.)]	0…30 (0…1.18)	0…50 (0…0.96)
Standard target [mm (in.)]	100 x 100 (3.93 x 3.93)	
Frequency	Approx. 390 kHz	Approx. 255 kHz
Response delay	Approx. 30 ms	Approx. 100 ms
Operating temperature [C (F)]	-25…70° (-13…158°)	
Storage temperature [C (F)]	-40…85° (-40…185°)	
Electrical		
Operating voltage	10…30V DC (analog voltage models are 15…30V DC)	
Output current	200 mA	
Current consumption	<20 mA	
Protection type	Short-circuit, reverse polarity, overload	
Output		
Output type	Analog: 4…20 mA/0…10V DC depending on model*	
Resolution	0.4 mm at max. sensing range	
Repeat accuracy	±0.5% of full-scale value	
Sensitivity adjustment	Remote teach/optional programming cable	
Environmental		
Enclosure type rating	IP67	
Shock	30 g, 11 ms	
Housing material	Brass, nickel-plated	
Connection	Micro-quick disconnect	
Certifications	cULus listed and CE marked for all applicable directives	

ATTENTION

If a hazardous condition can result from unintended operation of this device, access to the sensing area should be guarded.

IMPORTANT Solid-state devices can be susceptible to radio frequency (RF) interference depending on the power and the frequency of the transmitting source. If RF transmitting equipment is to be used in the vicinity of the solid-state devices, thorough testing should be performed to assure that transmitter operation is restricted to a safe operating distance from the sensor equipment and its wiring.

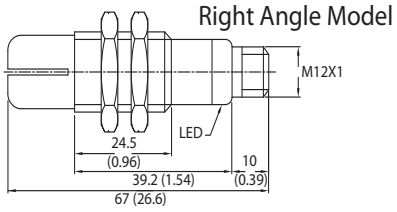
Models covered:

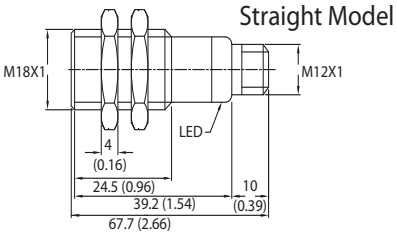
873M-D18AI300-D4 Analog current	873M-D18RAI300-D4 Right angle, analog current
873M-D18AI800-D4 Analog current	873M-D18RAI800-D4 Right angle, analog current
873M-D18AV300-D4 Analog voltage	873M-D18RAV300-D4 Right angle, analog voltage
873M-D18AV800-D4 Analog voltage	873M-D18RAV800-D4 Right angle, analog voltage

Indicator LED

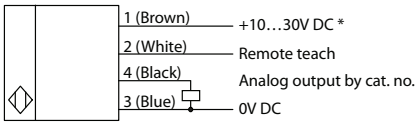
Operating Mode	Red LED	Yellow LED	Green LED
Teach Mode			
Target detected	One flash	Continuous flash	Off
No target detected	Flashes	Off	
Target marginal (invalid teach)			
Standard Mode			
Target present	Off	On	On
Target not present		Off	

Dimensions [mm (in.)]





Wiring Diagram



* Analog Voltage models are 15…30V DC

Analog Output Characteristics

- The analog output mode returns a 4…20 mA or 0…10V DC signal proportional to the measured value.
- The upper and lower adjustment range can be scaled to distance-fixed window, giving the user more flexibility.
- The sensor is taught using an easy four-step remote teach process or an optional programming cord.
- Two output functions: rising ramp and falling ramp.

Overview of Sensing and Adjustment Ranges

- When the target is beyond the far limit, or if target is absent, the output is identical to the status at the far limit.

  For example, if the span window is set to 4 mA at 7.62 mm (3 in.), and 20 mA at 203.2 mm (8 in.), the output will be 20 mA when the target is anywhere at or beyond 203.2 mm (8 in.), or if no target is present.
- In the *blind zone*, the output status is unpredictable because the sensor does not have time to settle after the pulse. It is therefore unable to accurately "hear" or interpret an echo.
- The *adjustment range* is where programming limits can be stored; the *sensing range* is where stable sensing is possible (see "Specifications").
- The following example for a 300 mm sensor demonstrates the need for both adjustment and sensing ranges:

  If the blind zone were 0…30 mm, and you set a sensing window of 50…300 mm, the output would become random/ unpredictable if the target object moved even slightly closer to the sensor than 30 mm.

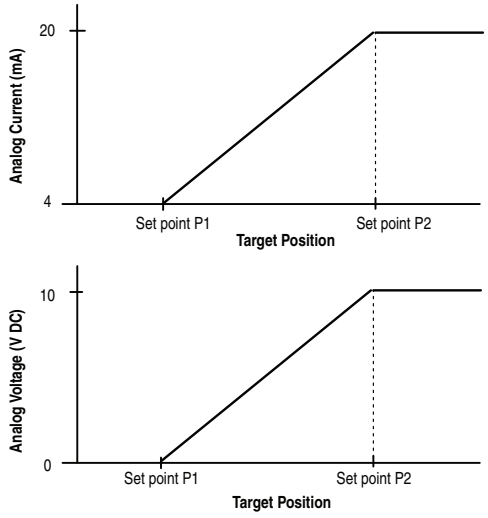
  By defining the sensing range (usable but non-adjustable area between 30 mm and 50 mm), the output is guaranteed to be stable if the target mistakenly moves closer than the 50 mm adjustable limit. Once the target moves into the blind zone (closer than 30 mm) the output status becomes random/ unpredictable.

Setting Measurement Range

Rising Ramp: current or voltage values rise as the distance from the target to the sensor increases.

Follow the steps below in the order they appear.

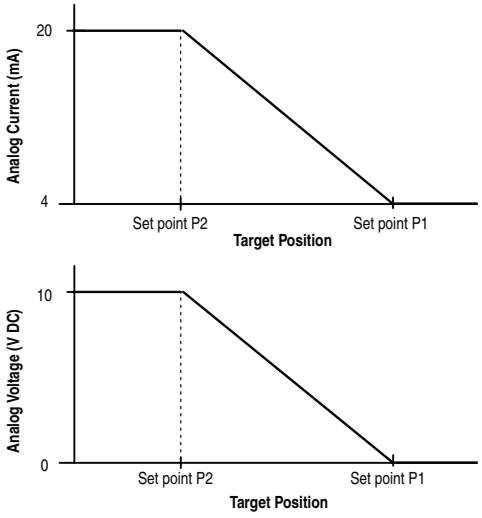
1. Place the target at the lower set point limit.
2. Using the white wire, connect to 0V DC [–] or press A1 on the optional programming cable.
3. Place the target at the upper set limit.
4. Using the white wire, connect to 10…30V DC [+] or press A2 on the optional programming cable



Falling Ramp: current or voltage values fall as the distance from the target to the sensor increases.

Follow the steps below in the order they appear.

1. Place the target at the lower set point limit.
2. Using the white wire, connect to 10…30V DC [+] or press A2 on the optional programming cable.
3. Place the target at the upper set limit.
4. Using the white wire, connect to 0V DC [–] or press A1 on the optional programming cable**.**



www.rockwellautomation.com

Power, Control and Information Solutions Headquarters

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444

Europe/Middle East/Africa: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640

Asia Pacifi : Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

10000231110 Ver 03
873M-IN001A-EN-P
June 2013