Acuity

The AR 100 laser position sensors are ultra compact devices for dimensional measurement. The unit uses laser triangulation principles to accurately measure at high speeds. The same mini enclosure houses models with ranges from 20 to 500 mm. Sensor options include blue laser diodes.

AR100 Laser Measurement Sensor

Principles of Operation

The AR100 is a triangulation sensor that measures distance by projecting a beam of laser light that creates a spot on a target surface. Reflected light from the surface is viewed from an angle by a CMOS detector array inside the AR100 sensor. The target's distance is calculated from the image pixel data using the sensor's microprocessor. The distance is transmitted through serial communications, and analog outputs. A variety of models are specified, each to allow a different measurement range and standoff.

Definitions

Range: Working distance between measurement endpoints over which the sensor will reliably measure displacement.

Base Distance: Offset distance from the face of the sensor to the beginning of the measurement edge. Accuracy is greatest at the middle of the range, and the laser spot size is the smallest at the middle of the measurement range.
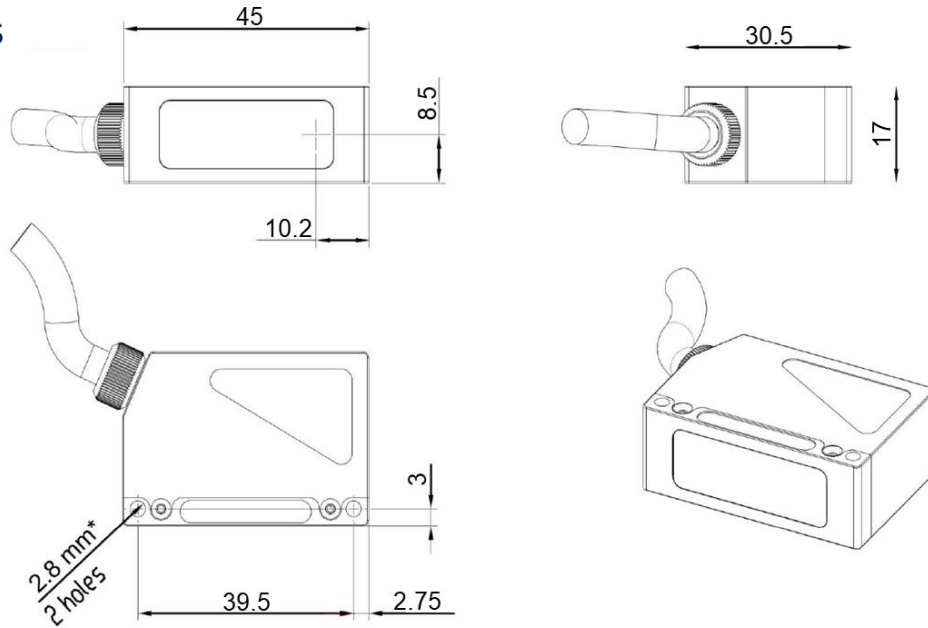
Linearity: The largest deviation from a best-fit straight line over the measurement range, created by data from the sensor with reference taken from a true distance scale. Stated as ±% of the Range.

Sample Rate: Speed that data samples are obtained from the sensor.

Model AR100		-10	-25	-50	-100	-250	-500
Base distance X, mm		20	20	30	50	65	105
Range, mm		10	25	50	100	250	500
Linearity, %		±0.05 % of the Full Scale range					±0.1 %
Resolution, %		0.01 % of the Full Scale range (for digital output)					0.02%
Temperature drift		0.02% range/°C					
Maximal sampling rate, Hz		9,400 Hz					
Light source		Red semiconductor laser, 660 nm wavelength or UV semiconductor laser 405 nm wavelength (BLUE version)					
Output power, mV		≤1					
Laser safety Class		2 (IEC60825-1)					
Output Interface	Digital	RS232 (max. 460.8 kbit/s) or RS485 (max. 460.8 kbit/s)					
	Analog	4 - 20 mA (load ≤ 500 Ohm) or 0 - 10 Volts					
Trigger input		2.4 - 24 V (CMOS, TTL)					
Logical output		Programmed functions, NPN: 100 mA max; 40 V max for output					
Power supply, V		24 (9 - 36) Volts					
Power consumption, W		1.5 - 2.0 Watts					
Environmental Resistance	Enclosure rating	IP67					
	Vibration	20g/10 - 1000Hz, 6 hours, for each of XYZ axes					
	Shock	30 g / 6 ms					
	Operation temperature, °C	-10 - +60 °C					
	Permissable Ambient light, lx	10,000					
	Relative humidity	5-95% (no condensation)					
	Storage temperature	-20 - +70, °C					
Housing material		aluminum, glass windows					
Weight (without cable)		40 grams					
Size, mm		17x45x30.5					

Dimensions

45

8.5

30.5

17

10.2

3

2.8 mm*
2 holes

39.5

2.75

AR100 Sensor Options

Connectivity kit: Includes terminal blocks, serial cable with D89 connector, AC power supply with 110 VAC or 240 VAC

High power lasers: Diode upgrades to blue for high sample rates on dark surfaces or in high ambient light.

Cables: optional, longer cables. Contact us for custom cabling needs. Analog interface: Optional 0-10 V analog signal. Replaces 4-20mA signal.

Safety Labels

LASER RADIATION AVOID EXPOSURE TO BEAM	Maximum output 0.95mW	Wavelength 660nm
AVOID EXPOSURE Laser radiation is emitted from this aperture	**CLASS 2 LASER PRODUCT** IEC/EN 60825-1 : 2007	

LASER RADIATION AVOID EXPOSURE TO BEAM	Maximum output 4.8mW	Wavelength 650nm
AVOID EXPOSURE Laser radiation is emitted from this aperture	**CLASS 3R LASER PRODUCT** IEC/EN 60825-1 : 2007	

LASER RADIATION AVOID EXPOSURE TO BEAM	Maximum output 20mW	Wavelength 660nm
AVOID EXPOSURE Laser radiation is emitted from this aperture	**CLASS 3B LASER PRODUCT** IEC/EN 60825-1 : 2007	

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