Acuity®

AR200 family of triangulation laser measurement sensors have five models to satisfy your range requirements with excellent resolution and sensitivity. The most accurate model measures distances over 6 mm with a resolution of 2 µm. The AR200-100 sensor measures 100 mm to within 30 µm.

Principles of Operation

The **AR200** sensors project a beam of visible laser light that creates a spot on a target surface. Reflected light from the surface is viewed from an angle by a CMOS line scan camera inside the AR200 sensor. The target's distance is computed from the image pixel data. The AR200 can not be overloaded and measures accurately to mirror-like surfaces where nearly the entire light beam reflects back to the detector.

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 range. Accuracy is greatest at the middle of the range, and the laser spot size is the smallest at the middle of the measurement range.

Resolution: Smallest change in distance that a sensor can detect. Stated as % of the full-scale 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 a +/- % of the range.

Sample Rate: Speed that data samples are obtained from the sensor. The maximum attainable sample rate is determined by the selected operating mode and target reflectance.

Background Light Elimination (BLE): A user-selected operating mode that improves measurement in bright surroundings by capturing an image with the laser off and subtracts it from the image taken with the laser on. Sample rates are lowered as a result.

Sensitivity: A measure of the relative ability to detect small amounts of reflected light. The better the sensitivity, the higher the attainable sample rate on surfaces such as glass, black paint and shiny plastic.

## AR200 Standard Model Specifications units in inches [metric]

AR200 Model	AR200-6	AR200-12	AR200-25	AR200-50	AR200-100
Range	0.250 [6.350 mm]	0.500 [12.70 mm]	1.00 [25.40 mm]	2.00 [50.80 mm]	4.00 [101.6 mm]
Base Distance	0.71 [18.03 mm]	0.664 [16.87 mm]	0.85 [21.59 mm]	0.67 [17.018 mm]	1.1 [27.94 mm]
Linearity +/- 0.1% of range	0.00025 [6.35 µm]	0.0005 [12.7 µm]	0.001 [25.4 µm]	0.002 [50.8 µm]	0.004 [101.6 µm]
Resolution 0.03% of range	0.00007 [1.9 µm]	0.00014 [3.8 µm]	0.0003 [7.6 µm]	0.0006 [15.2 µm]	0.0012 [30.5 µm]
Laser spot size At middle of range, end of range	35 µm, 100 µm	40 µm, 200 µm	45 µm, 130 µm	50 µm, 220 µm	55 µm, 250 µm
Laser type	650 nm, 1 mW max. visible RED, Class 2. Complies with 21 CFR 1040 with Laser Notice #50 and IEC/EN 60825-1:2001				
Sample Rates	0.2 - 1250 Hz, or sample on command (serial command or hardware trigger)				
Power	12 - 30 VDC, <150 mA				
Weight (less cable)	3 oz. [85 g]				
Operating Temperature	32 - 140°F [0 - 60°C]				
Environmental	NEMA -4, IP65. Keep optical windows clean for best performance. Aluminum case. Glass window. Compliant with RoHS directive regarding the reduction of the use of lead and other hazardous substances				
Output interfaces					
RS232	Full duplex serial, 300 - 115.2 Kbaud, ASCII or Binary formats				
4-20 m or 0-10V	Analog outputs selectable through sensor push-button				
Limit switch signals	2 NPN limit Alarm switches, sink up to 150 mA 2 PNP limit Alarm switches, source up to 150 mA				
Cable ft. [m]	6.5 ft. [2m], 16.4 ft. [5m], 32.8 ft. [10m], and 49.2 ft. [15m] lengths available, 8 conductor + shield, solder tail termination, PVC jacket				
	Red – Power +15 VDC (12-30 VDC)	White - Laser Disable (trigger)	Orange – Current Loop OUT, Voltage Output, NPN 1 sink, or PNP 1 source	Yellow – RxData	
	Black – Ground	Blue – Button disable	Brown –Current Loop return, Voltage signal return, NPN 2 sink, or PNP 2 source	Green - TxData	

Mechanical Dimensions units in inches [mm].

Laser Safety Label
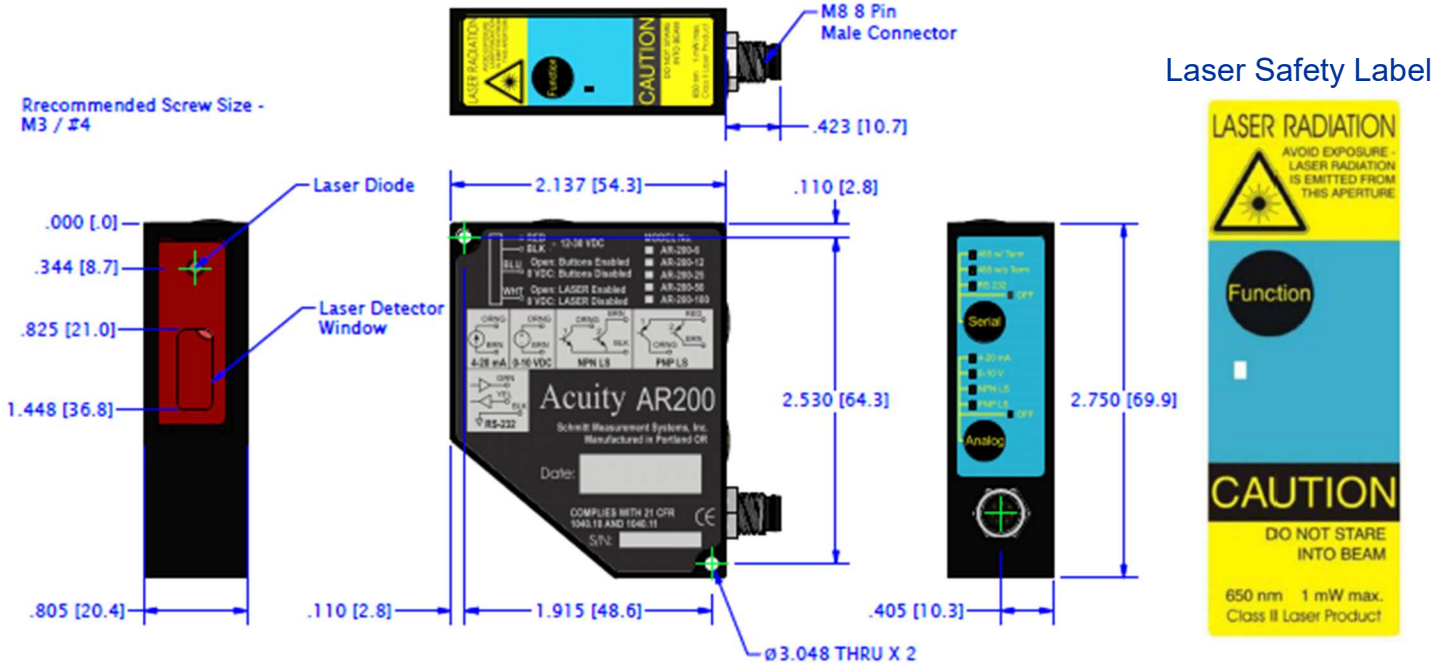
Available Cable Connections units in inches [mm].
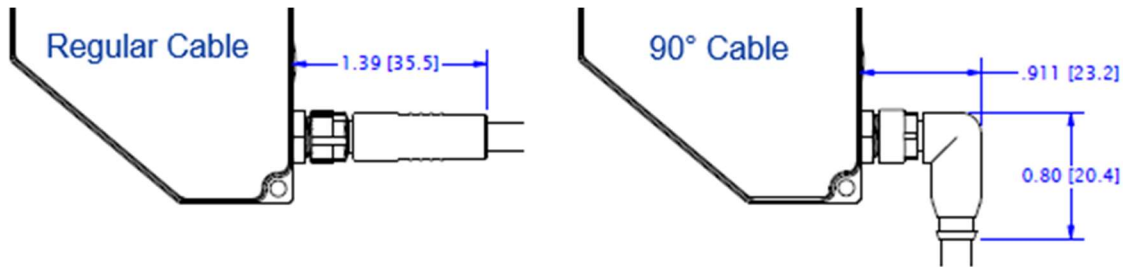
AR200 Sensor Options

Connectivity Kit: Junction block with DB9 serial cable and 110/240 VAC power supply.
Cables: 2 m cable standard. Longer lengths available. 0° (standard) and 90° (optional) cable connectors available.
Touch Panel Display: Touch controlled display that can control Acuity sensors, display their measurements, and calculate thickness and other dimensions through serial connections without the need for a separate computer.

Specifications subject to change without notice.