



AR2500 laser sensor is a high-speed rangefinder for system integration applications. The ultra-compact unit measures distances to 250 meters at 30 kHz sampling rates. Ideal for OEM installations, consider this model for vehicle height measurements or industrial scanning applications.

AR2500 Laser Sensor

Principles of Operation

The AccuRange 2500 laser sensor is a time-of-flight rangefinder that measures distance by rapidly-pulsing a collimated laser beam that creates an infrared spot on a target surface. Components of the reflected light signal are collected by a lens and focused onto a photodiode within the sensor unit. The roundtrip travel time is measured, and a resulting distance is calculated internally. That distance is transmitted through serial or analog interfaces. Maximum ranges exceed 100 feet (30 m) with the optional usage of reflectors. Otherwise, the sensor measures accurately to natural targets. With an ultracompact design, the AR2500 is used by equipment manufacturers for applications that demand very high sampling rates.



Definitions

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

Accuracy: The sum of all measurement errors when compared to a known standard.

Resolution: Smallest increment of change in distance that a sensor can detect.

Reproducibility: Similarity between duplicate measurements.

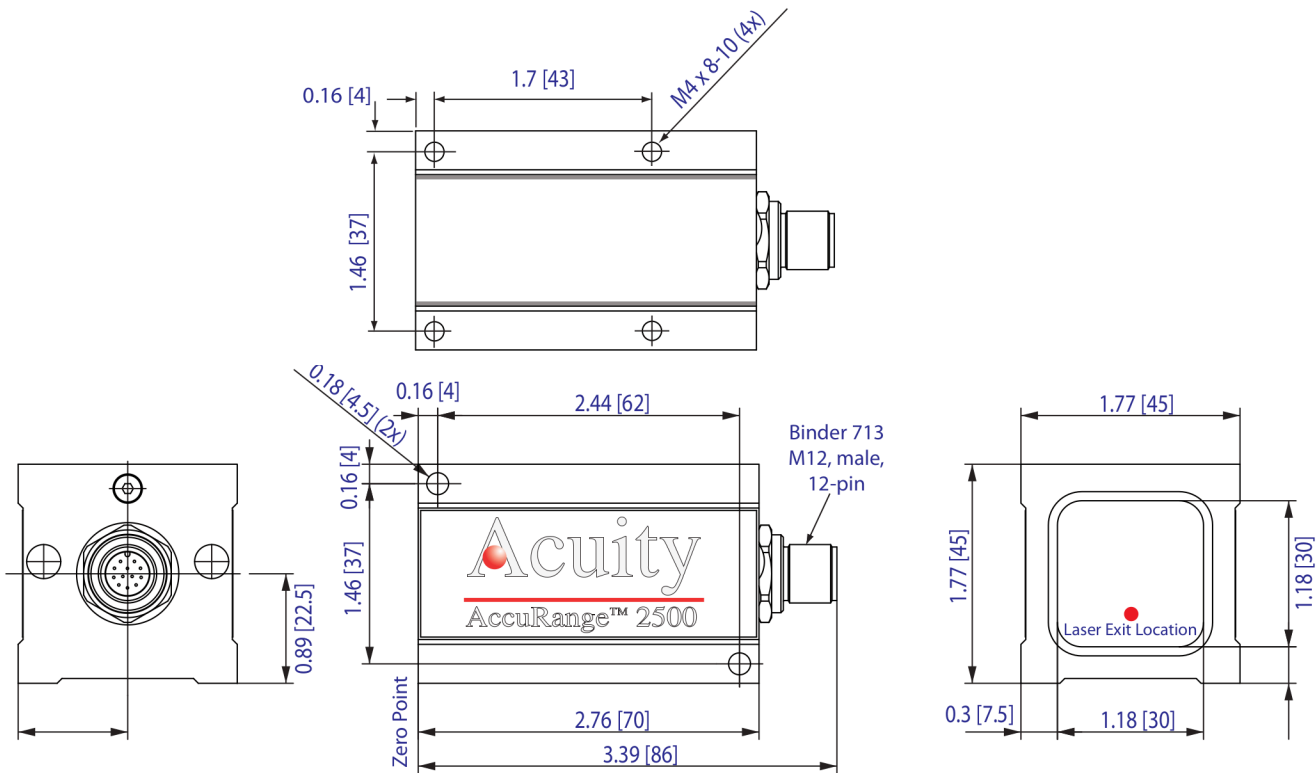
Sample Rate: Speed that data samples are obtained from the sensor.

AR2500 Standard Model Specifications units in inches unless noted metric. See manual for Module specifications.

	English Units	Metric Units
Range	8 in. min. to 100 ft. max (targets of 10% diffuse reflectance) 820 ft. max (retroreflective targets*)	0.2 to 30 m (targets of 10% diffuse reflectance) 250 m max (retroreflective targets*)
Accuracy **	+/- 0.8 in. (white target, 1000 samples averaged) +/- 2 in. (black target, no averaging)	+/- 2 cm (white target, 1000 samples averaged) +/- 5 cm (black target, no averaging)
Resolution	0.04 in.	1 mm
Laser spot	0.2 in., 3 mrad x 1 mrad divergence	5.1 mm, 3 mrad x 1mrad divergence
Weight (less cable)	0.3 lbs.	125 grams
Laser class	Class 1 eye-safe, Complies with 21 CFR 1040.10 with Laser Notice 50, IEC/EN60825-1:2007	
Laser type	905 nm, infrared	
Power	10 - 30 Volts DC, 3W max	
Sample rates	30 kHz maximum using binary data output, or sample trigger (serial command)	
Operating Temp	-4 to 122 °F (10-90% non-condensing Humidity)	-20 to 50 °C (10-90% non-condensing Humidity)
Environmental	NEMA – 4x, IP67. Keep optical windows clean for best performance. Aluminum case.	
Shock & Vibration	Shock (single): 500g / 1ms, DIN ISO-9022-3 Shock (continuous): 10g / 6ms / 1000x in all 6 directions, DIN ISO-9022-31-01-1 Vibration: 10 Hz ... 2000 Hz ... 10 Hz / 0,075mm / 1g / 2 cycles in 3 directions, DIN ISO-9022-36-02-1	
Serial outputs	RS232 full duplex, RS422 (option, replaces RS232)	
Analog outputs	4-20 mA, 2 limit switches (up to 200 mA sourcing)	
Cable	6.6 ft. (2 m) length, 12 conductor, shielded, PVC jacket, Binder series 713, M12 female connector	
	Red – 10-30 V	Pink - RX- (RS422)
	Black – Alarm Output 2 (Q2)	Grey – RX+ (RS422)
	White – TxD (RS232)	Grey / Pink - Analog out (4-20mA)
	Red / Blue - Ground (Analog signal)	Brown – Alarm Output 1 (Q1)
		Yellow – TX- (RS422)
		Green – TX+ (RS422)
		Blue – Ground (for supply voltage)
		Violet – RxD (RS232)

* Contact Acuity for these targets, ** See manual for dispersion at different frequency responses.

Mechanical Dimensions units in inches [mm]



AR2500 Sensor Options

Cables: Optional cable lengths. Contact us for custom cabling needs.

RS422: AR2500 sensor units can be ordered in either RS232 or RS422 versions

OEM Module: For OEM customers requiring large volumes of sensors, Acuity offers a bare, OEM version of the AR2500 to be installed inside a system. The customer engineers the protective housing. The OEM module has identical performance specifications as the standard AR2500, but includes only a CMOS-level serial interface RS422.



Laser Safety Labels



Repeatability Dispersion Calculations

Measurement Frequency (Hz)	# Samples Averaged	Output Frequency (Hz)	Repeatability 1 Sigma (mm)
16000	1	16000	50
16000	10	1000	16
16000	100	500	5
16000	1000	16	2

