Sonic Ranging Sensor
Model SR50A

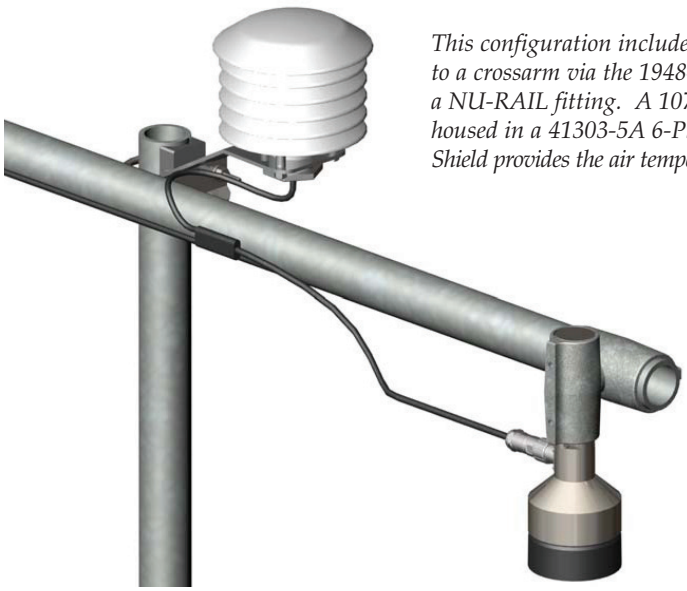
The SR50A, manufactured by Campbell Scientific Canada, is a rugged, acoustic sensor that provides a non-contact method for determining snow or water depth. The SR50A determines depth by emitting a ultrasonic pulse and then measuring the elapsed time between the emission and return of the pulse. An air temperature measurement is required to correct for variations of the speed of sound in air.

The SR50A was designed to meet the stringent requirements of measuring depths and uses a multiple echo processing algorithm to help ensure measurement reliability. It is compatible with our CR200-series, CR800, CR850, CR1000, CR3000, and CR5000 dataloggers, as well as most retired dataloggers. SDI-12, RS-232, and RS-485 output options are available for measuring the SR50A. Campbell Scientific's MD485 interface can be used to connect one or more SR50A sensors in RS-485 mode to an RS-232 device. This can be useful for sensors that require lead lengths that exceed the limits of either RS-232 or SDI-12 communications.

Mounting

To achieve an unobstructed view for the SR50A's beam, the SR50A is typically mounted to a tripod mast, tower leg, or user-supplied pole via the CM206 6 foot crossarm. The 19517 Mounting Kit can be used to attach the SR50A directly to the crossarm (see photo on page 2). Alternatively, the SR50A may be attached to the crossarm using the 19484 Mounting Stem and either the 17953 NU-RAIL Crossover Fitting or CM220 Right-angle Mount. If the surface is at an angle, the CM230 Adjustable Inclination Mount should be used instead of the NU-RAIL fitting or CM220 mount.

This exploded view shows how the 19484 connects to the SR50A.



This configuration includes an SR50A attached to a crossarm via the 19484 mounting stem and a NU-RAIL fitting. A 107 temperature probe housed in a 41303-5A 6-Plate Gill Radiation Shield provides the air temperature measurement.

Ordering Information

SR50A-L	Sonic ranging sensor with user-specified lead length; specify the lead length, in feet, after the L. Requires either the 19517 Mounting Kit or 19484 Mounting Stem to attach to the CM206 crossarm.
19517	SR50A Mounting Kit that attaches directly to the CM206 crossarm. A U-bolt is included for attachment to the crossarm (see photo below).
19484	Mounting Stem for attachment to a CM206 crossarm via the 17953 NU-RAIL fitting, CM220 mount, or CM230 mount.
17953	1" x 1" NU-RAIL Crossover Fitting (attaches the 19484 mounting stem to crossarm).
CM220	Right Angle Mounting Kit (attaches the 19484 mounting stem to crossarm).
CM230	Adjustable Inclination Mount for applications where the measurement surface is at an angle.
CM206	Six foot crossarm with mounting bracket for attachment to a tripod or tower.
MD485	RS-485 Multidrop Interface that is typically used when the application requires long cable lengths.

Specifications

Measurement Time:	<1.0 second
Output Options (selected by configuring internal jumpers):	SDI-12 (version 1.3), RS-232, RS-485
Buad Rates (RS-232, RS-485 modes):	1200 to 38400 bps
Power Requirements:	9 to 18 Vdc, typically powered by datalogger's 12 Vdc power supply
Power Consumption	
Active (typical):	250 mA
Quiescent (SDI-12 mode):	<1.0 mA
Quiescent (RS-232/RS485 modes):	<1.25 mA (baud rates ≤ 9600 bps); <2.0 mA (baud rates > 9600 bps)
Measurement Range:	1.6 to 32.8 ft (0.5 to 10 m)
Beam Acceptance:	~30°
Resolution:	0.01" (0.25 mm)
Accuracy:	±0.4" (1 cm) or 0.4% of distance to target (whichever is greatest); requires external temperature compensation.
Operating Temperature:	-45° to +50°C
Dimensions	
Length:	4.0" (10.1 cm)
Diameter:	3" (7.5 cm)
Max. Cable Length	
SDI-12:	200 ft (60 m)
RS-232:	200 ft (60 m) for baud rates less than or equal to 9600 bps
RS-485:	984 ft (300 m); cable lengths greater than 60 m require a heavier gauge wire if the power supply drops below 11 Vdc.
Weight:	2.2 lbs (1.0 kg)

The 19517's bracket mounts directly to a crossarm. Two screws are used to attach the SR50A to the 19517 bracket.

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