

Rugged acoustic distance sensors

For snow and water
depth measurements



SR50A (aluminum chassis)



SR50A-316SS (stainless-steel chassis)

Overview

The SR50A-series sonic ranging sensors^a provide a non-contact method for determining snow or water depth. They determine depth by emitting an 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.

Campbell Scientific offers three models: the SR50A, SR50A-316SS, and SR50AH. The SR50A-316SS has a marine grade stainless-steel chassis and parylene-coated transducer head that allows the sensor to be used in marine or other corrosive environments. The SR50AH includes a heater that prevents ice from coating the transducer.

Benefits and Features

- › Wide operating temperature range
- › User-selectable options for output
- › Rugged enough for harsh environments
- › Uses a multiple echo processing algorithm to help ensure measurement reliability
- › Compatible with most Campbell Scientific dataloggers

Mounting

To achieve an unobstructed view, the sensor is typically mounted to a tripod mast, tower leg, or user-supplied pole via the CM206 6-ft crossarm. The 19517 mounting kit attaches directly to the crossarm. The 19484 mounting stem attaches to the crossarm using the 17953

Nu-Rail fitting, CM220 right-angle mount, CM230 adjustable-angle mount, or CM230XL adjustable -angle mount. Use the CM230 or CM230XL when the surface is at an angle.

Output

SDI-12, RS-232, and RS-485 output options are available for measuring these sensors. Campbell Scientific's MD485 interface can be used to connect one or more SR50A-series 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.

^aThe SR50A-series sonic ranging sensors are manufactured by Campbell Scientific Canada.



Ordering Information

Sonic Ranging Sensor

For the following sonic ranging sensors, specify the cable length, in feet, after the -L, and choose a cable termination option.

SR50A-L	CSC sonic ranging sensor
SR50A-316SS-L	CSC stainless-steel sonic ranging sensor for Marine Environments
SR50AH-L	CSC sonic ranging sensor with heater

Cable Termination Options (choose one)

- PT** Cable terminates in stripped and tinned leads for direct connection to a datalogger's terminals.
- PW** Cable^b terminates in connector for attachment to a prewired enclosure.

RS-485 Interface

MD485	RS-485 Multidrop Interface for applications with long cable lengths.
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Mounting Hardware

19517	Mounting Kit that attaches directly to the crossarm. Either this mounting kit or the 19484 mounting stem (see below) is required to mount the sensor to a crossarm
19484	Mounting Stem that uses a 17953 Nu-Rail fitting, CM220 mount, CM230 mount, or CM230XL mount (see below) to attach the sensor to a crossarm. Either this stem or the 19517 mounting kit (see above) is required to mount the sensor to a crossarm.
17953	1-inxh x 1-inch Nu-Rail Crossover Fitting that attaches the 19484 mounting stem to a crossarm.
CM220	Right Angle Mounting Kit that attaches the 19484 mounting stem to a crossarm.
CM230	Adjustable Inclination Mount Kit for applications where the measurement surface is at an angle.
CM230XL	Adjustable Angle Mounting Kit with Extended Length. Provides same functionality as the CM230 but places the SR50A further from the crossarm.

Specifications

- View EU Declaration of Conformity documentation at: www.campbellsci.com/sr50a
- Measurement Time: < 1.0 s
- Output Options: SDI-12 version 1.3, RS-232, RS-485 (output options selected by configuring internal jumpers)
- Baud 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)
- Measurement Range: 0.5 to 10 m (1.6 to 32.8 ft)
- Beam Acceptance: ~30°
- Resolution: 0.25 mm (0.01 in)
- Accuracy: ±1 cm (0.4 in) or 0.4% of distance to target (whichever is greatest); requires external temperature compensation
- Operating Temperature Range: -45° to +50°C
- Length: 10.1 cm (4.0 in)
- Diameter: 7.5 cm (3 in)

Weight

- SR50A (no cable): 375 g (13.2 oz)
- SR50A-316SS (no cable): 795 g (28 oz)
- Cable (15 ft): 250 g (8.2 oz)

Maximum Cable Length

- SDI-12: 60 m (200 ft)
- RS-232: 60 m (200 ft); baud rates ≤9600 bps
- RS-485: 300 m (984 ft); cable lengths greater than 60 m require a heavier gage wire if the power supply drops below 11 Vdc

Power Consumption (no heater)

- Active (typical): 250 mA
- Quiescent SDI-12 Mode: < 1.0 mA
- Quiescent RS-232/RS-485 Modes:
 - < 1.25 mA (≤9600 bps),
 - < 2.0 mA (>9600 bps)

Heater (SR50AH only)

- Heater Resistance: 75 Ohms
- Nominal Operating Voltage: 12 V (ac or dc)^c
- Maximum Rated Wattage: 3 W
- Maximum Rated Voltage: 15 V (ac or dc)
- Maximum Operating Temperature: 25°C^d



Exploded view shows the 19484-to-SR50A connection.



^bOnly the sensor cable of the SR50AH terminates in a prewired connector. The heater-power cable terminates in stripped and tinned leads that attach to a datalogger switched 12V terminal. Therefore, the pre-wired enclosure configuration must include a conduit or compression fitting for routing the SR50AH heater-power cable.

^cUse a properly conditioned low noise power source. A noisy power source will affect operation of the sensor.

^dTurn the heater power off at temperatures above 25°C. This prevents damage to the sensor and reduces power consumption.