

CS475, CS476, CS477

Radar Water Level Sensors



The CS475, CS476, and CS477 are pulse-radar water-level sensors. They determine water level by emitting short microwave pulses and then measuring the elapsed time between the emission and return of the pulses. Common applications include water level measurements of rivers, lakes, tidal seas, and reservoirs.

The sensors differ in their measurement range and accuracy. The CS475 can measure up to 65 feet with an accuracy of ± 0.2 inches; the CS476 can measure up to 98 feet with an accuracy of ± 0.1 inches; and the CS477 can measure up to 230 feet with an accuracy of ± 0.6 inches.

These radar sensors output a digital SDI-12 signal to indicate level. This output is acceptable for recording devices with SDI-12 capability including Campbell Scientific dataloggers.

Features

- Ideal for areas where submersed sensors can be damaged due to corrosion, contamination, or flood-related debris
- Low maintenance—no moving parts significantly reduces maintenance cost and time
- Compatible with our CR200-series, CR510, CR10X, CR800-series, CR1000, CR3000, and CR5000 dataloggers
- Recalibration not needed
- Low current drain (4.7 mA sleep, 14 mA during measurement)
- Rugged NEMA 4x enclosure suitable for outdoor installations
- Wide operating temperature range (-40° to $+80^{\circ}\text{C}$)
- No FCC license required



Ordering Information

Pulse-Radar Water Level Sensors

- CS475-L** Radar Water Level Sensor with 65-ft Maximum Depth. Enter cable length, in feet, after the -L. A pigtail option is required (see below).
- CS476-L** Radar Water Level Sensor with 98-ft Maximum Depth. Enter cable length, in feet, after the -L. A pigtail option is required (see below).
- CS477-L** Radar Water Level Sensor with 230-ft Maximum Depth. Enter cable length, in feet, after the -L. A pigtail option is required (see below).

Pigtail Options (choose one)

- PT** Cable terminates in pigtails for direct connection to datalogger's terminals.
- PW** Cable terminates in a connector for attachment to a prewired enclosure.

Accessories

- 25619** Bubble level that helps align the radar sensor in a vertical position, which prevents measurement errors.
- 25616** Adjustment/Display Module used for changing settings, testing, and diagnostics. A cap is available for this display (see below).
- 25654** Cap with window for use with the 25616 display.



Specifications

Measurement Range

CS475:	2 inch to 65 ft (50 mm to 20 m)
CS476:	2 inch to 98 ft (50 mm to 30 m)
CS477:	16 inch to 230 ft (400 mm to 70 m)

Accuracy

CS475 (20 inch to 65 ft):	±0.2 inch (±5 mm)
CS476 (20 inch to 98 ft):	±0.1 inch (±3 mm)
CS477 (20 inch to 230 ft):	±0.6 inch (±15 mm)

Resolution:

0.0033 ft (1 mm)

Output Protocol:

SDI-12

Radar Unit

Frequency:

~26 GHz

Electromagnetic Compatibility:

Emission to EN 61326;
Electrical Equipment Class B

Pulse Energy:

1 mW maximum

Beam angle

CS475:	10° (3-in dia horn)
CS476, CS477:	8° (4-in dia horn)

Power Requirements

Input Voltage:

9.6 to 16 Vdc

Surge Protection:

1.5 KVA

Typical Current Drain with 12 V power supply

Sleeps:	4.7 mA
Measurement:	14 mA

Environmental

Temperature Range

Operating:	-40° to +80°C
Storage:	-40° to +80° C

Temperature Sensitivity:

average T_K : 2 mm/10 K,
max 5 mm over the entire
temperature range of
-40° to +80° C

Vibration Resistance:

Mechanical vibrations with 4 g
and 5 to 100Hz

Mechanical

Rating:

NEMA 4x

Housing:

Aluminum, coated IP66/68

Face Diameter:

0.625 inches (16 mm)

Horn Length

CS475:	5.4 inches (137 mm)
CS476, CS477:	16.9 inches (430 mm)

Horn Material:

316L stainless steel

