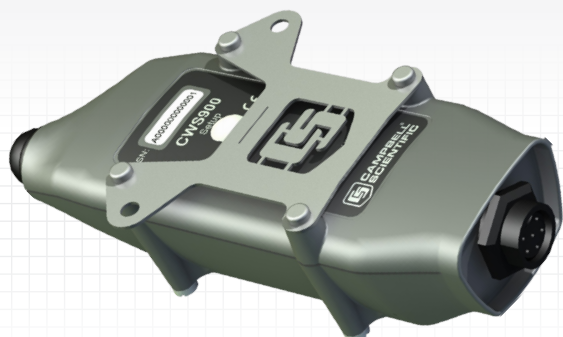




CWS900, CWS900A, CWS900E

Wireless Sensor Interfaces



Cable-Free Sensors

Adapt wide variety of sensors to wireless network

Overview

The CWS900, CWS900A, and CWS900E allow one sensor with a special connector to be used in a wireless sensor network; the special connector is available as an option for a large variety of

sensors. These interfaces have an internal spread spectrum radio^a that transmits data to a CWB100-series wireless base station or to another wireless sensor.

Benefits and Features

- › Internal frequency-hopping, spread spectrum radio provides longer range and less interference
- › Battery-powered using either alkaline batteries or a rechargeable battery and a solar cell
- › Transmissions can be routed through up to three other wireless sensors
- › A reliable, low maintenance, low power method for making measurements in applications where cabled sensors are impractical or otherwise undesirable
- › Compatible with Campbell Scientific's CR6, CR800, CR850, CR1000, and CR3000 dataloggers

Compatible Sensors^b

Sensors with the -CWS option include a connector that mates with the CWS900-series interface. Campbell Scientific offers sensors with the -CWS option that will measure:

- › Temperature
- › Relative humidity
- › Wind speed and direction
- › Rainfall
- › Solar radiation
- › Dissolved oxygen
- › Leaf wetness
- › Soil heat flux

The A150 Desiccant Case also has a -CWS option, which allows a pressure transducer or another sensor with a vented cable to be connected to a CWS900-series interface.

Technical Description

The CWS900-series interfaces measure analog voltages, low level AC, pulse counts, and can supply an excitation voltage for powering some sensors or making bridge measurements. The type of measurement that the sensor performs is configured using Wireless Sensor Planner, Network Planner, or DevConfig software.

The CWS900 interfaces with the PC for configuration via the A205 CWS Sensor to PC Interface..

A CWS900-series interface can route its transmissions through up to three other wireless sensors. A datalogger is connected to a CWB100-series base station for processing and storing the data.

^aThe internal radio in the wireless sensor is not meant to move a lot of data quickly. It takes 15 to 30 s per hop when moving data from a sensor, through a sensor used as a repeater, and ending up at the base radio. Going through three repeaters could take a data packet anywhere from 45 to 90 s to get to the base radio.

^bSpecific sensor models that are compatible with the CWS900 series are provided at: www.campbellsci.com/cws900

questions & quotes: 435.227.9120

campbellsci.com/cws900



Models

Model	Where Used	Frequency (MHz)	Compatible Base Stations	Compatible Wireless Sensors
CWS900	U.S., Canada	910 to 918	CWB100	CWS655, CWS220
CWS900A	Australia, New Zealand	920 to 928	CWB100A	CWS655A, CWS220
CWS900E	Europe	868	CWB100E	CWS655E, CWS220E

Why Wireless?

- › Require less installation time and labor than running cables through conduit or burying them in trenches
- › Can be used in buildings where local fire codes preclude the use of certain types of sensor cable
- › Ideal for applications that would require long cable lengths, which often decrease the quality of the measurement
- › Use fewer datalogger channels

Ordering Information

Wireless Reflectometers

- CWS900** Wireless Configurable Sensor Interface, 900 MHz
- CWS900A** Wireless Configurable Sensor Interface for Australia, 922 MHz
- CWS900E** Wireless Configurable Sensor Interface for Europe, 868 MHz

Power Options (choose one)

- ALK** Alkaline Battery with Lid
- RC** Battery with Solar Panels

Accessories

- A205** CWS Sensor to PC Interface. One A205 is required per wireless system. Allows sensor to be connected to PC for configuration.
- A150-L-CWS** Vented desiccated case with user-specified cable length and CWS900 connector option. Enter cable length, in feet, after the -L

Specifications

- › Compatible Datalogger Operating Systems
CR800.Std.21 and higher
CR1000.Std.21 and higher
CR3000.Std.21 and higher
- › Power: 2 AA batteries with a battery life of 1 year assuming sensor samples taken every 10 minutes. Optional solar charging available.
- › Average Current Drain: 300 μ A with 15 minute polling
- › Operating Temperature Range: -25° to +50°C
- › Operating Relative Humidity Range: 0 to 100% RH
- › Weather Resistance: IP67 rating for sensor and battery pack (battery pack must be properly installed); each sensor is leak tested
- › Dimensions: 15 x 6 x 4.5 cm (5.9 x 2.4 x 1.77 in)
- › Weight: 184 g (6.5 oz)
- › Measurement Range: -10° to + 70°C
- › Analog Channels
Single-Ended: SE1, SE2, SE3
Differential: DF1
- › Analog Input Range: -1 to +2.5 Vdc
- › Analog Measurement Accuracy
0° to + 50°C: $\pm(0.02\%$ of reading + 2 μ V)
-35° to + 70°C: $\pm(0.05\%$ of reading + 2 μ V)
- › Resolution: 0.3 μ V
- › Excitation Voltage: 2.5 V, 3.3 V, 5.0 V; 20 mA maximum
- › Excitation Voltage Accuracy: $\pm 2\%$ (-35° to +70°C)
- › Low Level AC Input: 20 mV minimum; 10 kHz maximum frequency

- › Temperature Accuracy: $\pm 0.2^\circ\text{C}$
- › Bridge Measurement Accuracy (+2.5 V excitation only)
0° to + 50°C: $\pm(0.03\%$ of reading + 3 μ V)
-35° to + 70°C: $\pm(0.07\%$ of reading + 3 μ V)^c

Switch Closure

- › Maximum Count Rate: 100 Hz
- › Minimum Open Time: 5 ms
- › Minimum Closed Time: 5 ms
- › Maximum Bounce Time: 4 ms
- › Maximum Number of Counts: records 1,000,000 counts before it rolls over

Internal 25 mW FHSS Radio

- › FHSS Channel
CWS900, CWS900A: 50
CWS900E: 16
- › Transmitter Power Output: 25 mW (+14 dBm)
- › Receiver Sensitivity: -110 dBm (0.1% frame error rate)
- › Typical Current Drain
Standby: 3 μ A
Receive: 18 mA (full run)
Transmit: 45 mA
Average Operating Current with 1 s Access Time: 15 μ A
- › Quality of Service Management: RSSI
- › Additional Features: GFSK modulation, data interleaving, forward error correction, BCH (31,21), data scrambling

^cDoes not include sensor and measurement noise, and external bridge resistor errors.