CAMPBELL SCIENTIFIC
WHEN MEASUREMENTS MATTER

CWS900

900 MHz Configurable Wireless Sensor Interface

Adapts Wide Variety of Sensors to Wireless Network

Overview

The CWS900 allows a 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. (See the Compatibility information on the web page.)

The CWS900 contains an internal 900 MHz spread-spectrum radio that transmits data to the CWB100 Wireless Base Station or to another wireless sensor. The frequency of the CWS900's internal radio is commonly used in the US and Canada.

Benefits and Features

- Allows a wide variety of sensors to be used in a wireless network
- Internal frequency-hopping, spread-spectrum radio provides longer range and less interference
- Battery powered
- A reliable, low-maintenance, low-power method for making measurements in applications where cabled sensors are impractical or otherwise undesirable
- Transmissions can be routed through up to three other wireless sensors

Detailed Description

The CWS900 has a sealed connector for attaching one rain gage, wind sensor, temperature/RH probe, or another low power sensor. It measures 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.

The CWS900 can route its transmissions through up to three other wireless sensors. A data logger is connected to the CWB100 base station for processing and storing the CWS900's data.

The CWS900 is battery powered using either alkaline batteries or a rechargeable battery and a solar cell.

Why Wireless?

There are situations when it is desirable to make measurements in locations where the use of cabled sensors is problematic. Protecting cables by running them through conduit or burying them in trenches is time consuming, labor intensive, and sometimes not possible. Local fire codes may preclude the use of certain types of sensor cabling inside of

buildings. In some applications measurements need to be made at distances where long cables decrease the quality of the measurement or are too expensive. There are also times when it is important to increase the number of measurements being made but the data logger does not have enough available channels left for attaching additional sensor cables.

Note: The internal radio is not designed to move a lot of data quickly. It takes 15 to 30 seconds 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 seconds to get to the base radio.

Specifications

Weather Resistance	IP67 rating for sensor and battery pack (Battery pack must be properly installed. Each sensor is leak tested.)
Operating Temperature Range	-25° to +50°C
Operating Relative Humidity Range	0 to 100%
Power Source	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 µA (with 15-minute polling and depending on attached sensor)
Analog Channels	› SE1, SE2, SE3 (single-ended) › DF (differential)
Analog Input Range	-1 to +2.5 Vdc
Resolution	0.3 µV
Excitation Voltage	2.5 V, 3.3 V, 5.0 V (20 mA maximum)
Excitation Voltage Accuracy	±2% (-35° to +70°C)
Low-Level AC Input	20 mV minimum (10 kHz maximum frequency)
Temperature Accuracy	±0.2°C
Analog Measurement Accuracy	› ±(0.05% of reading + 2 µV) (-35° to +70°C) › ±(0.02% of reading + 2 µV) (0° to 50°C)
Bridge Measurement Accuracy (+2.5 V excitation only)	› ±(0.07% of reading + 3 µV) (-35° to +70°C) Not including sensor and measurement noise, and external bridge resistor errors. › ±(0.03% of reading + 3 µV) (0° to 50°C)
Dimensions	15 x 6 x 4.5 cm (5.9 x 2.4 x 1.77 in.)
Weight	184 g (6.5 oz)

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

Frequency	902 to 918 MHz
Where Used	US and Canada
FHSS Channel	50
Transmitter Power Output	25 mW (+14 dBm)
Receiver Sensitivity	-110 dBm (0.1% frame error rate)
Standby Typical Current Drain	3 µA
Receive Typical Current Drain	18 mA (full run)
Transmit Typical Current Drain	45 mA
Average Operating Current	15 µA (with 1-second access time)
Quality of Service Management	RSSI
Additional Features	GFSK modulation, data interleaving, forward error correction, data scrambling, RSSI reporting

For comprehensive details, visit: www.campbellsci.com/cws900