



CWS220

900 MHz Wireless Infrared Radiometer



Cable-Free Sensor

Wireless network means flexibility, cost savings, time savings

Overview

The CWS220 is a wireless version of our SI-111 infrared radiometer. It measures the surface temperature of an object without physical contact. This radiometer has an internal 900

MHz spread-spectrum radio that transmits data to a CWB100 Wireless Base Station or to another wireless sensor.

The frequency of the CWS220's internal radio is commonly used in the US and Canada.

Benefits and Features

- › Provides road surface, plant canopy, soil surface, snow surface, and water surface temperature measurements
- › 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
- › Measures surface temperature continuously in the field
- › Ideal for providing spatial averages
- › Compatible with CR800, CR850, CR1000, and CR3000 dataloggers

Detailed Description

The CWS220 includes a thermopile, which measures surface temperature, and a thermistor, which measures sensor body temperature. The two temperature sensors are housed in a rugged body that contains a germanium window. It is battery powered using either alkaline batteries or a rechargeable battery and a solar cell.

The CWS220 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 its data. The CWS220 interfaces with a PC for configuration via the A205 CWS Sensor to PC Interface.

The calibration coefficients used for determining the target temperature by means of the Stefan-Boltzman equation are stored in the CWS220 at the time of calibration.



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 μ A (with 15-minute polling)
Response Time	< 1 s (to changes in target temperature)
Target Temperature Output Signal	60 μ V per °C difference from sensor body
Body Temperature Output Signal	0 to 2500 mV
Wavelength Range	8 to 14 μ m (Corresponds to atmospheric window.)
Field of View (FOV)	22° half angle
Absolute Accuracy	› \pm 0.5°C (-40° to +70°C) › \pm 0.2°C (-10° to +65°C)
Uniformity	› \pm 0.3°C (-40° to +70°C) › \pm 0.1°C (-10° to +65°C)

Optics	Germanium lens
Repeatability	› \pm 0.05°C (-10° to +65°C) › \pm 0.1°C (-40° to +70°C)
Dimensions	15 x 6 x 4.5 cm (5.9 x 2.4 x 1.77 in.)
Weight	270 g (9.6 oz)

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 μ A
Receive Typical Current Drain	18 mA (full run)
Transmit Typical Current Drain	45 mA
Average Operating Current	15 μ A (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/cws220 



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