Campbell SCIENTIFIC

WH232

WeatherHawk Weather Station with RS-232

Overview

The WH232 is a weather station preconfigured to measure wind speed, wind direction, air temperature, relative humidity, barometric pressure, solar radiation, and rainfall. All optional user software selections enable the display of the sensor information. The WH232 is directly connected to a host device (PC or server) through an RS-232 serial data I/O located on the bottom of the weather station.

Detailed Description

Wind speed is measured by a three-cup rotating anemometer. The rotating component of the sensor spins in response to the wind and turns a magnet within a coil to generate a sine wave output proportional to velocity. This technique is well proven and reliable under normal conditions, but the rotating component can lock up in freezing or icy conditions.

Wind direction is measured by a sensor consisting of a vane connected to a wire-wound resistor. As the vane turns on its pivot point, the resistance increases or decreases with respect to wind direction. This is translated by the weather station into a measurement in degrees with respect to a datum, typically magnetic North, which is physically established when the weather station is installed.

Air temperature and relative humidity (RH) sensors are combined in an integrated, user-replaceable unit that requires no calibration. The RH sensor is a thin polymer, resistive sensor that degrades with exposure due to age and airborne contaminates. It should be user replaced every 18 to 24 months to maintain accuracy, and at a shorter interval if the location is subject to high levels of air pollution or is subject to airborne chemical spraying. The air temperature sensor is a fine-wire thermistor, with a rapid response; it is typically not subject to environmental degradation.

Barometric pressure is measured with a capacitive silicon temperature-corrected strain gauge device that is typically not degraded by environmental exposure and does not require calibration after manufacture.

Solar radiation is measured by a scientific-grade silicon pyranometer with a cut filter limiting the spectral exposure to the 300 to 1100 nm wavelength. This device typically degrades at a rate of 2% of the full scale value each year and should be recalibrated, or replaced every three to five years, depending on the application.

Rainfall is measured with a tipping bucket rain gauge. During a rain event, drops are captured in a funnel of a known size and directed through an orifice to form a drip stream. This drip stream flows into a volumetric measurement device (a tipping bucket or spoon), which fills with a calibrated amount and then tips. The tipping motion dumps the water and activates a switch that produces an electrical pulse. The water then drains from the bottom of the rain gauge, and the mechanism returns

to its "catch" location to fill again. The pulses are counted by the weather station and multiplied by the known volume of the tipping bucket to produce a rainfall amount, and when compared to time, a rainfall rate.

Specifications

Communications	Serial data (wired)
Temperature Range	-40º to +50ºC (-40° to +122°F)
Memory Capacity	128 kB of nonvolatile Flash RAM (~32,000 data points)
Power Requirements	16 to 22 Vdc
Radio Type	Spread spectrum
Frequency	922 MHz
Antenna Type	Omnidirectional, ¼ wave, whip (fully enclosed in weatherproof housing)
Gain	0 dBd
Antenna Range	0.8 km (0.5 mi) line of sight

For comprehensive details, visit: www.campbellsci.com/wh232

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