



Advanced Technology

Identifies size, type, and velocity of precipitation

Overview

The PWS100 is a laser-based sensor that measures precipitation and visibility by accurately determining the size and velocity of water droplets in the air. It can be used in weather stations in road and airport applications. The PWS100 uses advanced measurement techniques and algorithms to calculate individual precipitation particle type.

For aviation applications, users can be assured that the PWS100 complies with CAA and ICAO guidance and meets or exceeds all recommendations and specifications. (This includes

CAP437, CAP670, and CAP746.) ICAO compliant frangible masts are available for aviation use.

To enhance the PWS100 algorithms, Campbell Scientific recommends adding a [CS215-PWS Temperature and Relative Humidity Probe](#) (listed on the [Ordering Information page](#) under Common Accessories), which will cause the data from the CS215-PWS to be fed directly into the PWS100 precipitation type and visibility algorithms.

Note: Campbell Scientific does not recommend using the PWS100 for marine applications.

Benefits and Features

- ▶ Unique calibration kit available to calibrate particle size and speed measurement to give confidence in reliable measurement of present weather parameters
- ▶ Identifies many precipitation types, including drizzle, rain, snow, hail, and graupel
- ▶ Patented four beam, two receiver system directly measures hydrometeor size and velocity
- ▶ Reports MOR Visibility in range 0 to 20,000 m with programmable alarm

Detailed Description

The PWS100 Present Weather Sensor is a laser-based sensor capable of determining precipitation and visibility parameters for automatic weather stations including road and airport stations. Due to its advanced measurement technique and

fuzzy logic algorithms, the PWS100 can determine individual precipitation particle types from accurate size and velocity measurements and the structure of the received signal.

Auxiliary measurements of temperature and relative humidity (RH) provide improved particle classification.

The PWS100 consists of a Digital Signal Processor (DSP) housing unit connected to a sensor arm that contains one laser

head and two sensor heads. Each sensor head is 20° off axis to the laser unit axis—one in the horizontal plane and the other in the vertical plane. The PWS100 ships with a stainless-steel quick-release clip-on V-bolt mounting bracket that attaches the DSP housing to a mast or pole.

Specifications

Measuring Area	40 cm ² per light sheet
IP Rating	IP 66 (NEMA 4X)
Housing Material	Iridite NCP conversion coated aluminium (RoHS compliant) and hard anodized aluminum
Communication	RS-232, RS-422, or RS-485
Baud Rate	Selectable from 300 bps to 115.2 kbps
Control Unit	Custom DSP Board
EMC Compliance	Tested and conforms to BS EN61326:1998
Dimensions	115 x 70 x 40 cm (45.28 x 27.56 x 15.75 in.)
Weight	8 kg (17.6 lb)

Power Requirements

DSP Power	9 to 24 Vdc (or 9 to 16 Vdc with CS215-PWS Temperature and RH sensor)
Current Consumption	200 mA to 1 A
Hood Heater	24 Vac or dc, 7 A

Optical

Laser Source	Near-infrared diode, eye safe Class 1M unit output
Peak Wavelength	830 nm
Modulation Frequency	96 kHz
Receivers	Photodiode with band pass filters
Spectral Response	Maximum spectral sensitivity at 850 nm, 0.62 A/W (0.6 A/W at 830 nm)

Lens Check Light Source Near-infrared LED

Measurement

Particle Size	0.1 to 30 mm (0.0039 to 1.18 in.)
Size Accuracy	±5% (for particles greater than 0.3 mm [0.0118 in.]
Particle Velocity	0.16 to 30 m/s
Velocity Accuracy	±5% (for particles > 0.3 mm [0.012 in.]
Types of Precipitation Detected	Drizzle, rain, snow grains, snowflakes, hail, ice pellets, graupel, mixed (combination of types above)
Rain Rate Intensity Range	0 to 400 mm/h
Rainfall Resolution	0.0001 mm
Rain Total Accuracy	Typically ±10% Accuracy figures are for laboratory conditions with reference particles and standards; accuracy will be degraded for windy conditions, frozen precipitation, and very high rainfall rates.
Visibility Range	0 to 20,000 m (0 to 65,616.8 ft)
Visibility Accuracy	±10% to 10,000 m (±10% to 32,808.4 ft)
Visibility Measurement Interval	User-selectable from 10 s to 2 h
External Sensors	SDI-12 compatible sensors supported (such as the CS215-PWS Temperature and RH Probe)

For comprehensive details, visit: www.campbellsci.com.au/pws100



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