



USB SMART SILICON-CELL PYRANOMETERS | SP-420

Features

Stable Measurements

Long-term non-stability determined from multiple replicate pyranometers in accelerated aging tests and field conditions is less than 2 % per year.

Unique Design

An accurate, cosine-corrected patented design sheds water and dirt for a self-cleaning performance. Sensors are housed in a rugged anodized aluminum body and electronics are fully-potted.

No Datalogger Required

Sensor can be connected to a desktop, laptop, or tablet computer via a USB 2.0 type A plug. The ApogeeConnect software gives the user control of data logging settings, provides real time output display and graph measurements, and allows the data set to be saved as a csv file for further analysis. Sensor has ability to hold up to 10,000 measurements.

Typical Measurement Applications

- Solar panel arrays
- Agricultural, ecological, and hydrological weather networks

Mounting

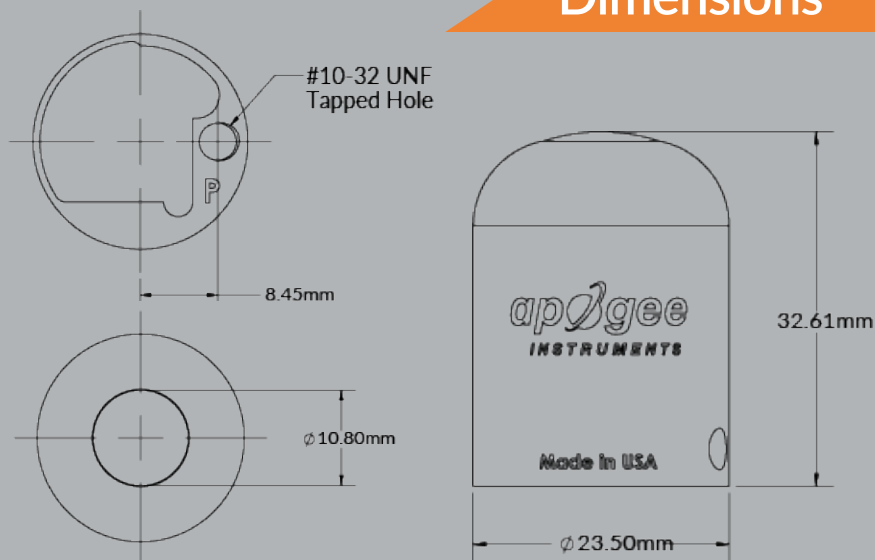
The AM-110 mounting bracket facilitates mounting the AL-100 leveling plate to a mast or pipe. The bubble level in the plate makes leveling simple and accurate.

Accurate and stable global shortwave radiation measurement

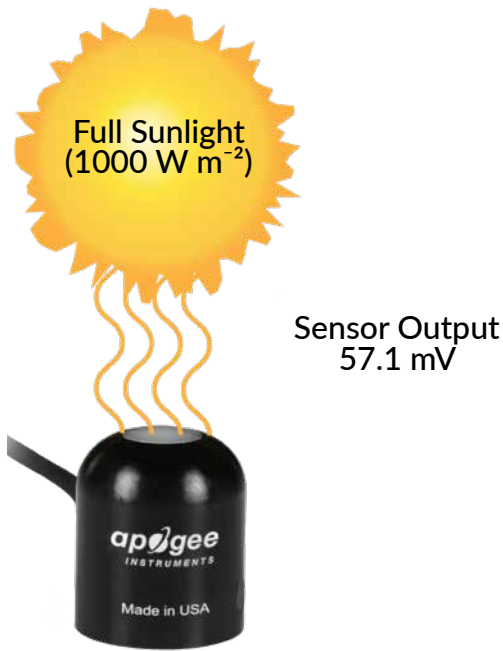
Calibration Traceability

Apogee SP sensors are calibrated through side-by-side comparison to the mean of (4) Apogee SP-110 transfer standard sensors under high intensity discharge metal halide lamps. The transfer standard sensors are calibrated through side-by-side comparison to the mean of at least (2) ISO-classified reference pyranometers under sunlight in Logan, UT. Each of (4) ISO-classified reference sensors are recalibrated on an alternating year schedule at the National Renewable Energy Laboratory (NREL) in Golden, Colorado. NREL reference standards are calibrated to the World Radiometric Reference (WRR) in Davos, Switzerland.

Dimensions



Shortwave Radiation Measurement



Example of total shortwave radiation measurement with an Apogee SP-510 pyranometer. Full sunlight yields total shortwave radiation on a horizontal plane at the Earth's surface of approximately 1000 W m⁻². This yields an output signal of 57.1 mV (varies from sensor to sensor). The signal is converted to shortwave radiation by multiplying by the calibration factor of 17.5 W m⁻² per mv (approximately, varies from sensor to sensor)

Product Specifications

SP-420	
Power Supply	Uses a 5 V USB power source with a 2.1 mA current draw when logging
Calibration Factor (reciprocal of output)	Custom for each sensor and stored in firmware
Calibration Uncertainty	± 5 %
Measurement Repeatability	Less than 1 %
Long-term Drift	Less than 2 % per year
Non-linearity	Less than 1 % up to 1750 W m ⁻²
Response Time	Software updates every second
Field of View	180°
Spectral Range	360 to 1120 nm
Directional (Cosine) Response	± 5 % at 75° zenith angle
Temperature Response	0.04 ± 0.04 % per C
Operating Environment	-40 to 70 C; 0 to 100% relative humidity; can be submerged in water up to depths of 30 m
Dimensions	33 mm height, 24 mm diameter
Mass	90 g
USB Cable	4.6 m (15 ft)
Warranty	4 years against defects in materials and workmanship