Texas Electronics

"Relied on Worldwide in the Most Extreme Conditions"

Solar Radiation Sensor

SP-LITE Solar Radiation Sensor

Description

The Texas Electronics, Inc. SP-Lite Solar Radiation Sensor utilizes a Kipp & Zonen Silicon pyranometer mounted in a white powder-coat finished aluminum bracket that provides a stable upward-facing installation. It measures the solar energy that is received from the entire hemisphere (180 degrees field of view). The output is expressed in Watts per square meter. The pyranometer is designed for continuous outdoor use. Its calibration is valid for natural sunlight only, but not artificial light. In its most frequent application, the pyranometer is used for measuring the solar radiation emitting on the horizontal surface. The sensor consists of a photodiode, housing, mounting bracket with cable junction box attached, and cable. A resistance shunts the photodiode, generating a voltage output. The photodiode and the material on top of it determine most electrical specifications. It is encapsulated in the housing in such a way that it has a field of view of 180 degrees and that its angular characteristics fulfill the "Cosine Response". The nominal output resistance of the pyranometer is 50 Watts. This implies that the input impedance of the readout equipment should be at least 5000 Ohms in order to make an error of less than 0.1%. Cable can be extended without problems to a length of 328 ft. (100 meters), provided that cable resistance is less than 0.1% of the input impedance of the readout equipment. The electrical sensitivity of the photodiode changes with the temperature. A nominal value for this is 0.2% change per degree Celsius. Calibration is performed at 20°C (68°F).

Features & Benefits

- SP-Lite is an all-weather instrument
- Designed for continuous outdoor use
- Complies with "Cosine Response"
- Full 180-degree field of view for complete hemispheric measurement
- Contained in lightweight and rugged white powder coat finished aluminum mounting bracket

Installation & Maintenance

Installation:

The site for an upward-facing pyranometer should be free from any significant obstructions above the plane of the sensing element and should be readily accessible. Ideally, the instrument should be located so that (1) a shadow will not be cast on it at any time (e.g. by radio masts, etc.); (2) it is not close to light-colored walls or other objects likely to reflect sunlight onto it; and (3) it is not exposed to artificial radiation sources. A flat roof provides the best location, or a rigid stand with a horizontal upper surface some distance from building structures or other obstructions. The stand should be sufficiently rigid that the horizontal position of the receiving surface does not change, especially during high winds. Precautions should be taken to avoid subjecting the instrument to severe shocks or vibration.

Calibration / Cleaning Frequency:

Recalibration is recommended every two years, preferably by letting a higher standard run parallel during two sunny days and comparing daily totals.

The sensor should be kept clean, using water or alcohol.

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Specifications

Electrical:

Impendence (nominal):	50 Ohms
Response time:	<1 sec.
Sensitivity (nominal):	100 uV/W/m²
Expected signal range under atmospheric conditions:	0 to 0.2V
Stability:	< +/- 2% per year
Non-linerity:	<1% up to 1000 W/m²
Temperature dependence of sensitivity:	+/- 0.15% / °C
Spectral range:	0.4 to 1.1 nm
Detector type:	SILICON photo diode
Directional:	Cosine corrected between 80° angle of Incidence, error:within +/- 10% Cosine errors averaged over opposite azimuth error (at 60° Angle of incidence):within +/- 10%

Mechanical:

Material of housing:	Anodized aluminum contained in white Powder-coat finished aluminum mounting bracket
Dimensions:	Height from surface to top of level
Width:	Pyranometer - 6.25" (15.87 cm)
Environmental:	Working temperature range - -22 to +158°F (-30° to +70°C)
Cable:	60', 24 Gauge 2 conductor
Warranty:	3 years

Ordering Information

Model#	Description
SP-Lite	Solar Radiation Sensor
SP-Lite	Solar Radiation Sensor, 4-20 mA

Optional Parts/Accessories