Texas Electronics

"Relied on Worldwide in the Most Extreme Conditions"

SP-LITE
SP-LITE-A
Solar Radiation Sensor
User's Manual

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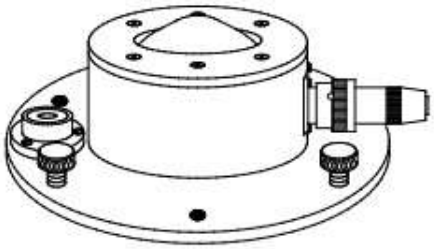


DESCRIPTION

Model SP-LITE Solar Radiation Sensor

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).

Specifications	**SP-LITE**	**SP-LITE-A**
Electrical:		
Impedance (nominal):	50 ohms	50 ohms
Response time:	<1 sec.	<1 sec.
Sensitivity (nominal):	100 uV/W/m²	4-20 mA = 0-1200 W/m²
Expected signal range under		
atmospheric conditions:	0 to 0.2V	0 to 0.2V
Stability:	<+/- 2% per year	<+- 2% per year
Non-linearity:	<1% up to 1000 W/m²	<1% up to 1000 W/m²
Temperature dependence of		
sensitivity:	+/-0.15% / °C	+/-0.15% / °C
Spectral Range:	0.4 to 1.1 nm	0.4 to 1.1 nm
Detector Type:	SILICON photo diode	SILICON photo diode
Directional:	Cosine corrected between 80° angle	Cosine corrected between 80° angle
	of incidence, error: within +/- 10%	of incidence, error: within +/- 10%
	Cosine errors averaged over opposite	Cosine errors averaged over opposite
	azimuth error (at 60° angle of incidence):	azimuth error (at 60° angle of incidence):
	within +/- 10%	within +/- 10%
Tilt response:	no error	no error

Mechanical:		
Material of housing:	Anodized aluminum contained in	Anodized aluminum contained in
	white powder-coat finished aluminum	white powder-coat finished aluminum
	mounting bracket	mounting bracket
Dimensions:	Height from surface to top of level	Height from surface to top of level
	Pyranometer - 6.25” (15.87 cm)	Pyranometer - 6.25” (15.87 cm)
Width:	2.75” (6.98 cm)	2.75” (6.98 cm)
Length:	8.25” (20.95 cm)	8.25” (20.95 cm)
Weight:	3 lbs. (1.36 kg) w/60’ cable	3 lbs. (1.36 kg) w/60’ cable
Environmental:	Working temperature range -	Working temperature range -
	-22° to +158°F (-30° to +70²C)	-22° to +158°F (-30° to +70°C)
Cable:	60’, 24 Gauge 2 conductor	60’, 24 Gauge 2 conductor
Warranty:	3 years	3 years

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.

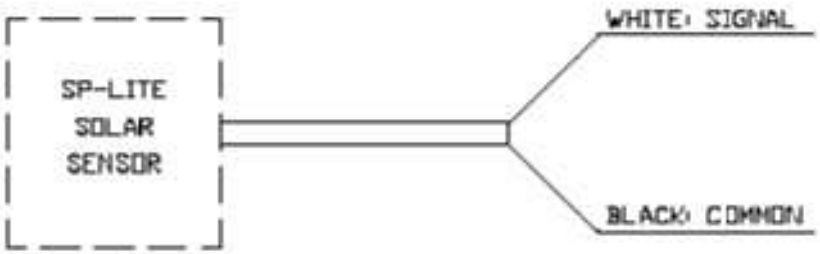
The sensor should be kept clean, using water or alcohol.

ORDERING INFORMATION

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

Optional Parts / Accessories

WIRING DIAGRAM



TYPICAL RANGE
0-1400 W/m²

OUTPUT
100 µV W/m²

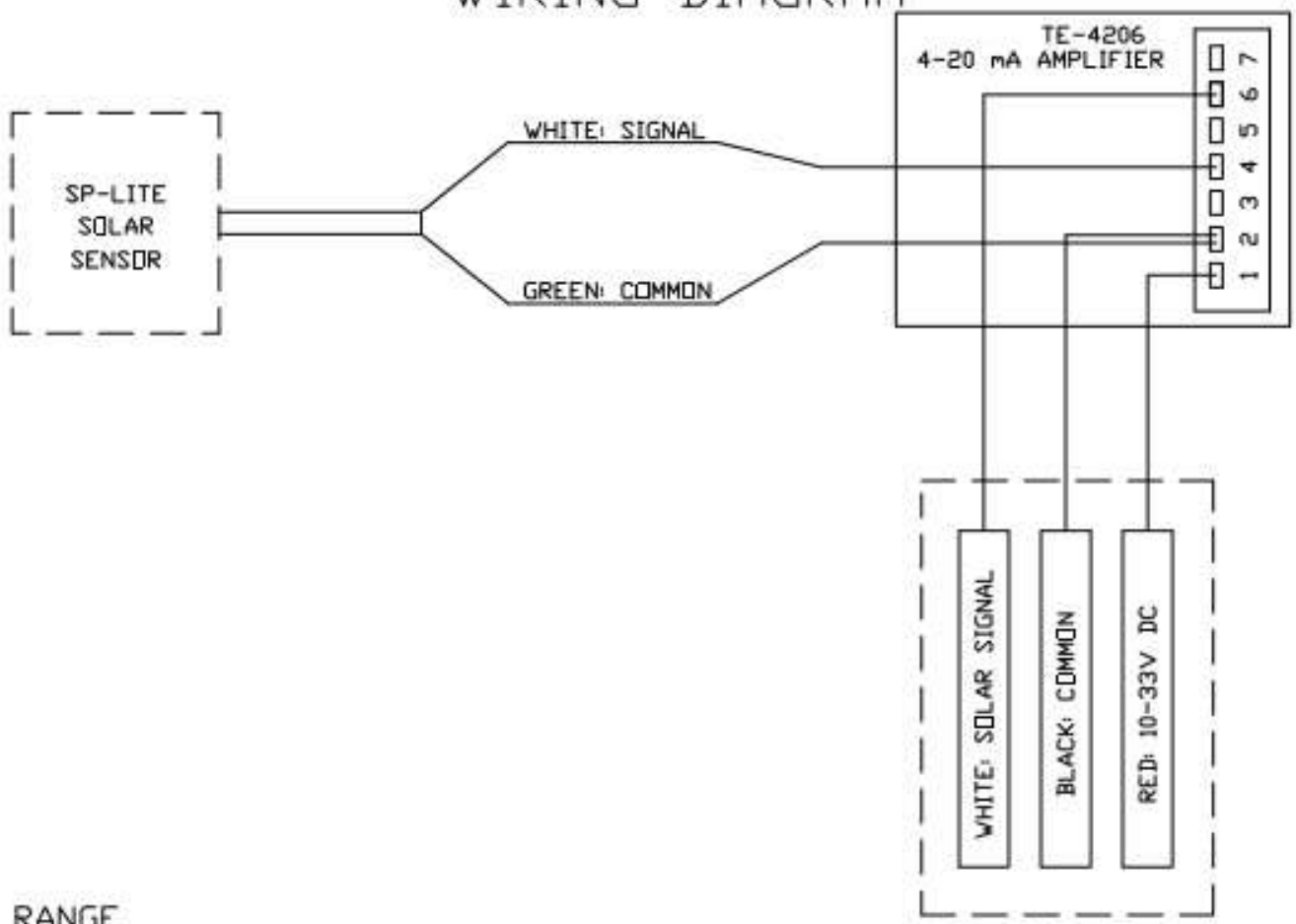
Texas Electronics, Inc.
The Gold Standard in Weather Instrumentation Since 1957

TITLE: SP-LITE SOLAR RADIATION SENSOR
WIRING DIAGRAM

SIZE	FSCM NO.	DWG NO.	REV
A		3009	A

SCALE		SHEET
		1-1

WIRING DIAGRAM



TYPICAL RANGE
0-1400 W/M^2

OUTPUT
4 to 20 mA

Texas Electronics, Inc.
The Gold Standard in Weather Instrumentation Since 1957

TITLE: SP-LITEA SOLAR RADIATION SENSOR			
SIZE: A	FSCM NO.	DWG NO.: 3008	REV: A
SCALE		SHEET 1-1	

Warranty

Texas Electronics, Inc. (hereafter TEI) warrants the equipment manufactured by it to be free from defects in material and workmanship. Upon return, transportation charges prepaid to TEI, within three (3) years of original shipment of sensors and one (1) year of original shipment of electronics, recorders and indicators, TEI will repair or replace, at its option, any equipment which it determines to contain defective material or workmanship, and will return said equipment to purchaser, F.O.B., TEI. Texas Electronics shall not be obligated however to repair or replace equipment which has been repaired by others, abused, improperly installed, altered or otherwise misused or damaged in any way. TEI will not be responsible for any dismantling, re-assembly, or reinstallation charges.

This warranty is in lieu of all other warranties, expressed or implied. TEI shall not be liable for any special, indirect, incidental or consequential damages claimed in connection with any rescission of this agreement by purchaser.