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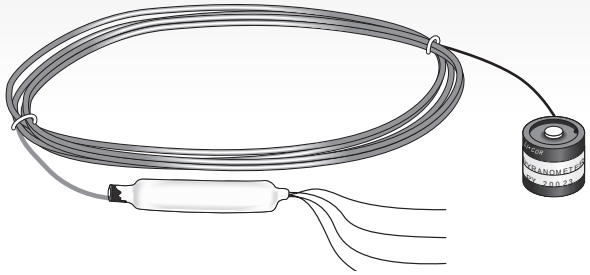
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CAMPBELL SCIENTIFIC
WHEN MEASUREMENTS MATTER

LI190SB and LI200X

Solar Radiation Sensors



Accurate, Versatile

Compatible with most Campbell Scientific dataloggers

Overview

The LI190SB[1] and LI200X[1] measure solar radiation with a silicon photovoltaic detector mounted in a cosine-corrected head. A shunt resistor in the sensor's cable converts the signal from microamps to millivolts, allowing the LI190SB and LI200X to be measured directly by a Campbell Scientific datalogger[2].

Benefits and Features

LI190SB

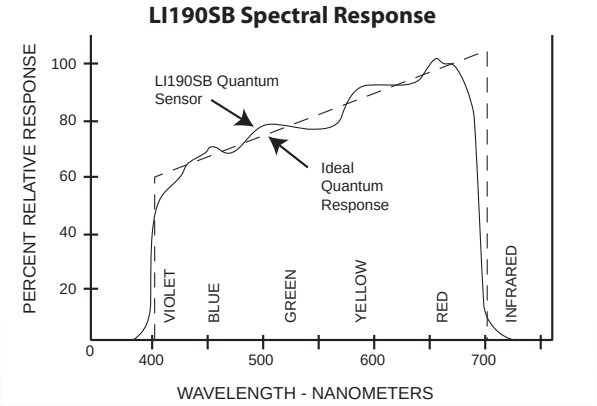
- Ideal for growth chambers and greenhouses
- Measures Photosynthetic Photon Flux Density (PPFD) in both natural and artificial light
- Compatible with the CWS900-series interfaces, allowing it to be used in a wireless sensor network

LI200X

- Calibrated for the daylight spectrum (400 to 1100 nm)
- Completion circuit in its cable standardizes calibration, allowing sensors to be interchanged without altering multiplier and offset values

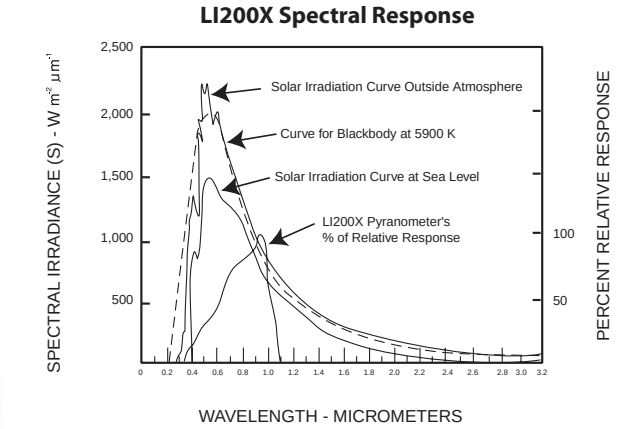
LI190SB Quantum Sensor

LI190SB accurately measures Photosynthetic Photon Flux Density (PPFD) in both natural and artificial light. PPFD is the number of photons in the 400 to 700 nm waveband incident per unit time on a unit surface. Because PPFD describes photosynthetic activity, the LI190SB is ideal for growth chambers and greenhouses.



LI200X Silicon Pyranometer

The LI200X is calibrated against an Eppley Precision Spectral Pyranometer (PSP) to accurately measure sun plus sky radiation. It is used extensively in solar, agricultural, meteorological, and hydrological applications. The LI200X should not be used under vegetation or artificial lights because it is calibrated for the daylight spectrum (400 to 1100 nm).



[1]The LI190SB and LI200X are manufactured by Li-Cor.
[2]The Li190SB and LI200X are not compatible with the CR200(X)-series dataloggers.

Mounting

To ensure accurate measurements, the sensor should be leveled using a LI2003S leveling fixture which incorporates a bubble level and three adjusting screws. The LI2003S leveling fixture mounts to a crossarm using the CM225 mount. The LI190SB and LI200X should be mounted away from all obstructions and reflective surfaces that might adversely effect the measurement.

Ordering Information

Solar Radiation Sensors

Recommended cable length is 11 feet.

LI200X-L LI-COR Silicon Pyranometer with fixed calibration. Enter cable length, in feet, after the -L. Must choose a cable termination option (see below).

LI190SB-L LI-COR Quantum Sensor with user-specified cable length; enter cable length, in feet, after the -L. Must choose a cable termination option (see below).

Cable Termination Options (choose one)

-PT Cable terminates in stripped and tinned leads for direct connection to a datalogger's terminals.

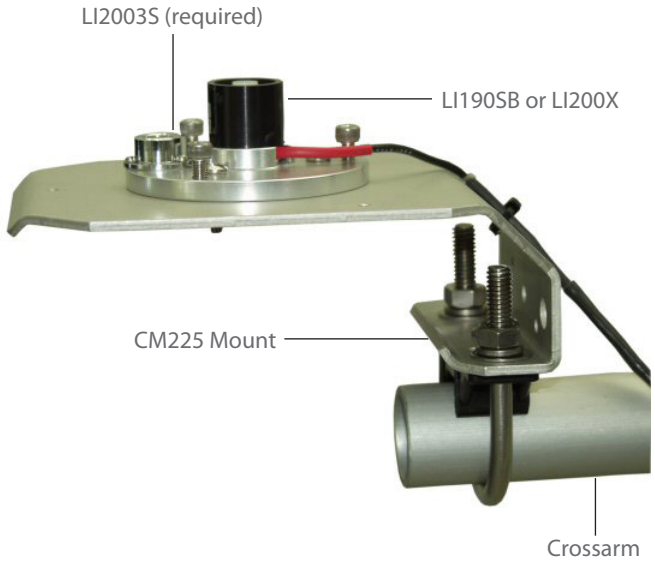
-PW Cable terminates in a connector for attachment to a prewired enclosure.

-CWS Cable terminates in a connector for attachment to a CWS900 interface. Connection to a CWS900 interface allows the LI190SB to be used in a wireless sensor network (see note).

Accessories

LI2003S Base and leveling fixture used to level the sensor.

CM225 Solar Sensor Mounting Stand that's used to attach the LI2003S and sensor to a crossarm.



The CM225 attaches to a crossarm by placing the U-bolt in the holes on the bottom of the bracket.

Specifications

- Stability: <±2% change over a 1 year period
- Response Time: 10 µs
- Temperature Dependence: 0.15% per °C maximum
- Cosine Correction: Cosine corrected up to 80° angle of incidence
- Operating Temperature Range: -40° to +65°C; the overmolding that protects the completion circuit in the cable of the LI200X may crack if the temperature drops below -40°C
- Relative Humidity Range: 0 to 100%
- Detector: High stability silicon photovoltaic detector (blue enhanced)
- Sensor Housing: Weatherproof anodized aluminum case with acrylic diffuser and stainless steel hardware
- Diameter: 2.38 cm (0.94 in)
- Height: 2.54 cm (1.00 in)
- Weight: 28 g (1 oz)

LI190SB

- Calibration: ±5% traceable to the U.S. National Institute of Standards Technology (NIST)
- Sensitivity: Typically 5 µA per 1000 µmoles s^{-1} m^{-2}
- Linearity: Maximum deviation of 1% up to 10,000 µmoles s^{-1} m^{-2}
- Shunt Resistor: ±15% over thermal conductivity range from 0.1 to 1.7 W m^{-2} K^{-1}
- Light Spectrum Waveband: 400 to 700 nm

LI200X

- Accuracy: Absolute error in natural daylight is ±5% maximum; ±3% typical
- Sensitivity: 0.2 kW m^{-2} mV^{-1}
- Linearity: Maximum deviation of 1% up to 3000 W m^{-2}
- Shunt Resistor: Adjustable, 40.2 to 90.2 Ω, factory set to the above sensitivity
- Light Spectrum Waveband: 400 to 1100 nm

NOTE: The CWS cable termination option is offered for the LI190SB, but not the LI200X. However, the -CWS option is offered for the LI200S pyranometer, which is the same sensor as the LI200X, except the LI200S does not have the completion circuit in its cable. A unique calibration entry is required for each LI200S probe.

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