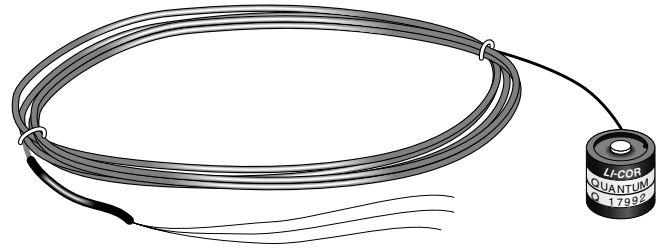


# LI190SB and LI200X

LI-COR's Solar Radiation Sensors



The LI190SB and LI200X 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. Please note that the LI190SB and LI200X are not compatible with our CR200(X)-series dataloggers.



The LI190SB Quantum Sensor is shown above. The LI200X has a similar appearance.

## 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

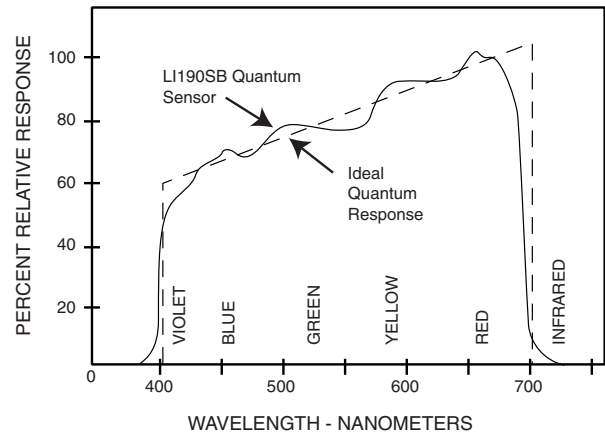
The LI200X is calibrated against an Eppley Precision Spectral Pyranometer (PSP) to accurately measure sun plus sky radiation. It is used extensively in solar, agricultural, meteorological, and hydrological applications. The LI200X should not be used under vegetation or artificial lights because it is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

The LI200X includes a completion circuit in its cable. This completion circuit standardizes the sensor's calibration, allowing sensors to be interchanged without altering multiplier and offset values.

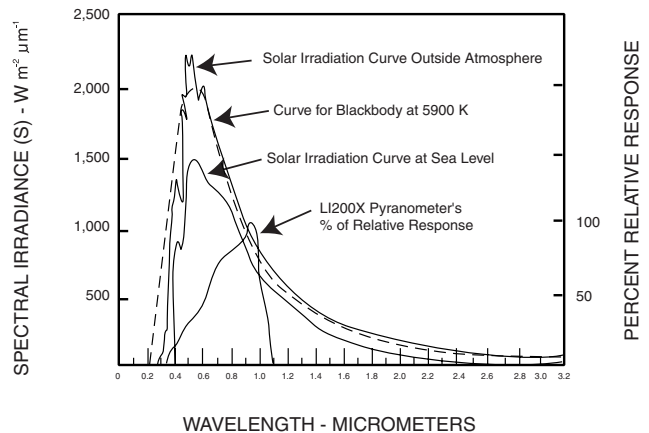
## Sensor Mounts

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 tripod or tower using the CM225 mount. For most applications, Campbell Scientific recommends attaching the CM225 to a CM202, CM204, or CM206 crossarm. The CM225 can also be attached to a tripod or tower mast.

### LI190SB Spectral Response



### LI200X Spectral Response



## 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).

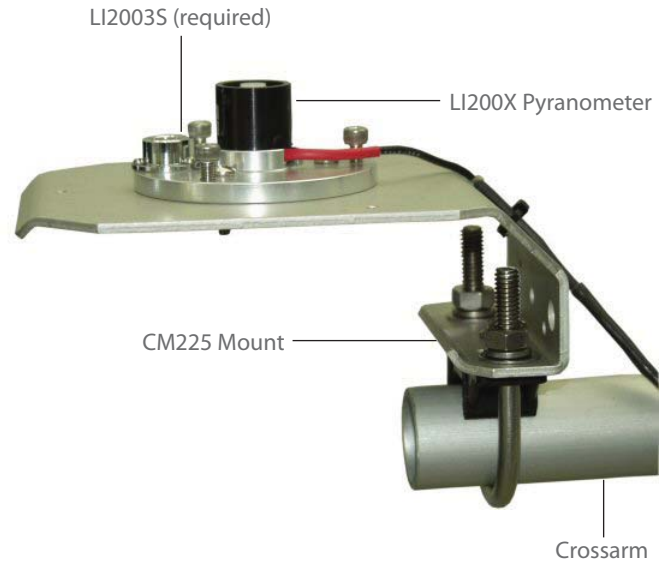
**LI190SB-L** LI-COR Quantum Sensor with user-specified cable length; enter cable length, in feet, after the -L. Must choose a cable termination option (see below).

### 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 tripod, tower, or vertical pipe.



To attach the CM225 to a CM202, CM204, or CM206 crossarm, place the U-bolt in the holes on the bottom of the bracket (shown). If the CM225 is attached to a mast, place the U-bolt in the holes in the side of the bracket.

## Specifications

<b>Stability:</b>	<±2% change over a 1 year period
<b>Response Time:</b>	10 $\mu$ s
<b>Temperature Dependence:</b>	0.15% per °C maximum
<b>Cosine Correction:</b>	Cosine corrected up to 80° angle of incidence
<b>Operating Temperature:</b>	-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
<b>Relative Humidity:</b>	0 to 100%
<b>Detector:</b>	High stability silicon photovoltaic detector (blue enhanced)
<b>Sensor Housing:</b>	Weatherproof anodized aluminum case with acrylic diffuser and stainless steel hardware
<b>Dimensions</b>	
<b>Diameter:</b>	0.94 in. (2.38 cm)
<b>Height:</b>	1.00 in. (2.54 cm)
<b>Weight:</b>	1 oz (28 g)

### LI190SB Quantum Sensor

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

### LI200X Silicon Pyranometer

<b>Accuracy:</b>	Absolute error in natural daylight is ±5% maximum; ±3% typical
<b>Sensitivity:</b>	0.2 kW $m^{-2} mV^{-1}$
<b>Linearity:</b>	Maximum deviation of 1% up to 3000 W $m^{-2}$
<b>Shunt Resistor:</b>	Adjustable, 40.2 to 90.2 ohm, factory set to the above sensitivity
<b>Light Spectrum Waveband:</b>	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. The LI200S 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.

