

# INSTRUCTION MANUAL



## LI200RX Pyranometer

6/16



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# Safety

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**DANGER — MANY HAZARDS ARE ASSOCIATED WITH INSTALLING, USING, MAINTAINING, AND WORKING ON OR AROUND TRIPODS, TOWERS, AND ANY ATTACHMENTS TO TRIPODS AND TOWERS SUCH AS SENSORS, CROSSARMS, ENCLOSURES, ANTENNAS, ETC. FAILURE TO PROPERLY AND COMPLETELY ASSEMBLE, INSTALL, OPERATE, USE, AND MAINTAIN TRIPODS, TOWERS, AND ATTACHMENTS, AND FAILURE TO HEED WARNINGS, INCREASES THE RISK OF DEATH, ACCIDENT, SERIOUS INJURY, PROPERTY DAMAGE, AND PRODUCT FAILURE. TAKE ALL REASONABLE PRECAUTIONS TO AVOID THESE HAZARDS. CHECK WITH YOUR ORGANIZATION'S SAFETY COORDINATOR (OR POLICY) FOR PROCEDURES AND REQUIRED PROTECTIVE EQUIPMENT PRIOR TO PERFORMING ANY WORK.**

Use tripods, towers, and attachments to tripods and towers only for purposes for which they are designed. Do not exceed design limits. Be familiar and comply with all instructions provided in product manuals. Manuals are available at [www.campbellsci.com](http://www.campbellsci.com) or by telephoning (435) 227-9000 (USA). You are responsible for conformance with governing codes and regulations, including safety regulations, and the integrity and location of structures or land to which towers, tripods, and any attachments are attached. Installation sites should be evaluated and approved by a qualified engineer. If questions or concerns arise regarding installation, use, or maintenance of tripods, towers, attachments, or electrical connections, consult with a licensed and qualified engineer or electrician.

## General

- Prior to performing site or installation work, obtain required approvals and permits. Comply with all governing structure-height regulations, such as those of the FAA in the USA.
- Use only qualified personnel for installation, use, and maintenance of tripods and towers, and any attachments to tripods and towers. The use of licensed and qualified contractors is highly recommended.
- Read all applicable instructions carefully and understand procedures thoroughly before beginning work.
- Wear a **hardhat** and **eye protection**, and take **other appropriate safety precautions** while working on or around tripods and towers.
- **Do not climb** tripods or towers at any time, and prohibit climbing by other persons. Take reasonable precautions to secure tripod and tower sites from trespassers.
- Use only manufacturer recommended parts, materials, and tools.

## Utility and Electrical

- **You can be killed** or sustain serious bodily injury if the tripod, tower, or attachments you are installing, constructing, using, or maintaining, or a tool, stake, or anchor, come in **contact with overhead or underground utility lines**.
- Maintain a distance of at least one-and-one-half times structure height, 20 feet, or the distance required by applicable law, **whichever is greater**, between overhead utility lines and the structure (tripod, tower, attachments, or tools).
- Prior to performing site or installation work, inform all utility companies and have all underground utilities marked.
- Comply with all electrical codes. Electrical equipment and related grounding devices should be installed by a licensed and qualified electrician.

## Elevated Work and Weather

- Exercise extreme caution when performing elevated work.
- Use appropriate equipment and safety practices.
- During installation and maintenance, keep tower and tripod sites clear of un-trained or non-essential personnel. Take precautions to prevent elevated tools and objects from dropping.
- Do not perform any work in inclement weather, including wind, rain, snow, lightning, etc.

## Maintenance

- Periodically (at least yearly) check for wear and damage, including corrosion, stress cracks, frayed cables, loose cable clamps, cable tightness, etc. and take necessary corrective actions.
- Periodically (at least yearly) check electrical ground connections.

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# LI200RX Pyranometer

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## 1. Introduction

The LI200RX pyranometer monitors sun plus sky radiation. It connects directly to our dataloggers and is used extensively in solar, agricultural, and meteorological applications. This pyranometer includes a completion circuit in its cable that standardizes calibration, allowing complete sensors and cabling to be interchanged without altering multiplier and offset values.

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**NOTE**

This manual provides information only for CRBasic dataloggers. It is also compatible with most of our retired Edlog dataloggers. For Edlog datalogger support, see an older LI200X manual at [www.campbellsci.com/old-manuals](http://www.campbellsci.com/old-manuals) or contact a Campbell Scientific application engineer for assistance.

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## 2. Precautions

- READ AND UNDERSTAND the *Safety* section at the front of this manual.
- Care should be taken when opening the shipping package to not damage or cut the cable jacket. If damage to the cable is suspected, consult with a Campbell Scientific application engineer.
- Although the LI200RX is rugged, it should be handled as a precision scientific instrument.
- Keep the sensor clean. The vertical edge of the diffuser must be kept clean to maintain appropriate cosine correction.
- Clean the sensor only with water, mild detergent, or vinegar. Alcohol, organic solvents, abrasives, or strong detergents harm the acrylic materials, which will adversely affect the cosine response of the sensor.
- The black outer jacket of the cable is Santoprene® rubber. This compound was chosen for its resistance to temperature extremes, moisture, and UV degradation. However, this jacket will support combustion in air. It is rated as slow burning when tested according to U.L. 94 H.B. and will pass FMVSS302. Local fire codes may preclude its use inside buildings.
- The completion circuit in cable means that the sensor head and base are not interchangeable with other LI200RX pyranometers.
- Send the whole sensor (not just the head) to Campbell Scientific for recalibration or repair.

### 3. Initial Inspection

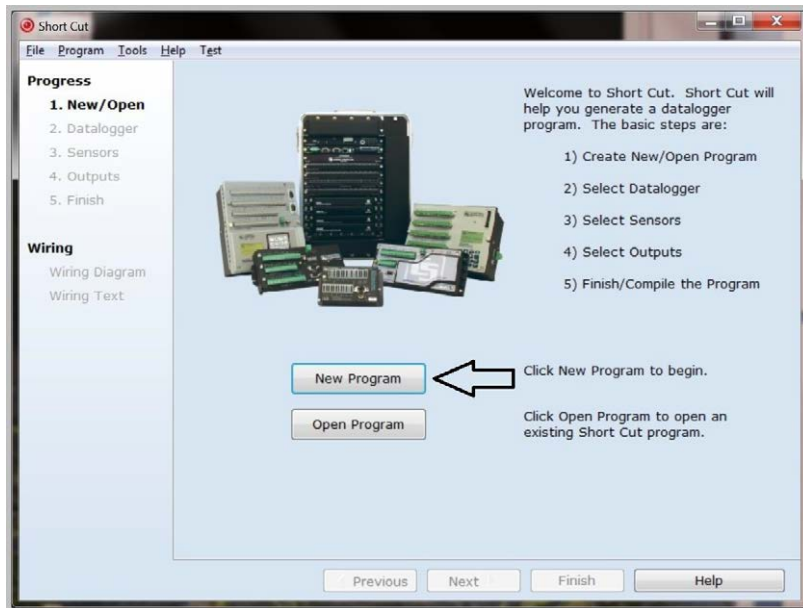
- Upon receipt of the LI200RX, inspect the packaging and contents for damage. File damage claims with the shipping company.
- The model number and cable length are printed on a label at the connection end of the cable. Check this information against the shipping documents to ensure the correct product and cable length are received.

### 4. QuickStart

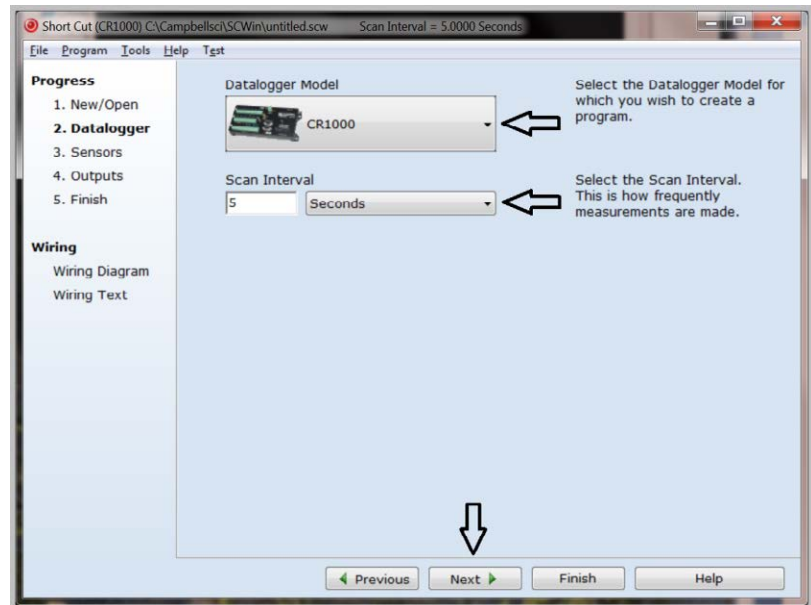
*Short Cut* is an easy way to program your datalogger to measure the LI200RX and assign datalogger wiring terminals. *Short Cut* is available as a download on [www.campbellsci.com](http://www.campbellsci.com) and the *ResourceDVD*. It is included in installations of *LoggerNet*, *PC200W*, *PC400*, or *RTDAQ*.


The following procedure shows using *Short Cut* to program the LI200RX.

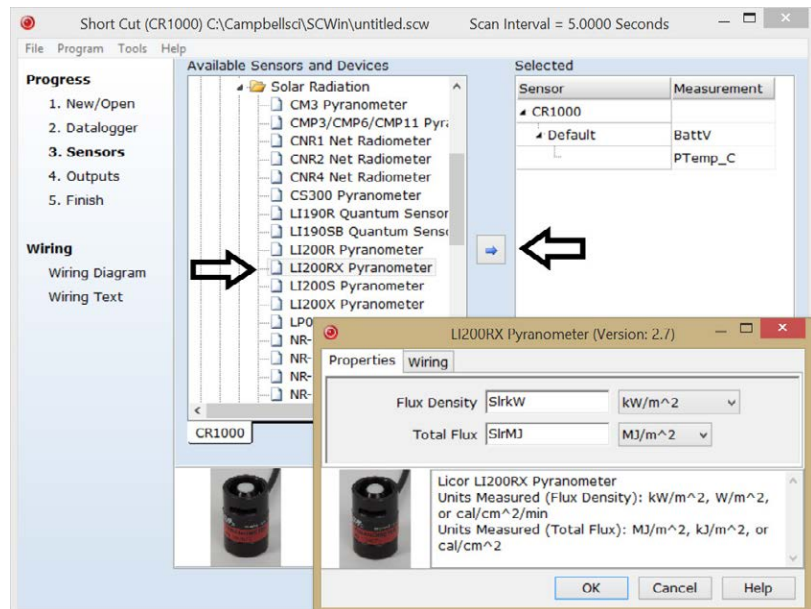
1. Open *Short Cut*. Click **New Program**.



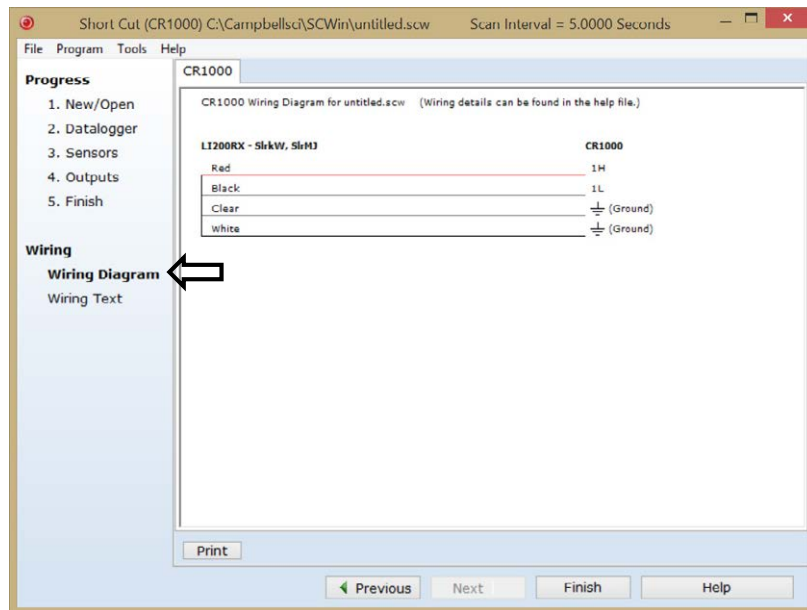
2. Select **Datalogger Model** and **Scan Interval** (default of 5 seconds is OK for most applications). Click **Next**.



3. Under the **Available Sensors and Devices** list, select the **Sensors | Solar Radiation** folder. Select **LI200RX Pyranometer**. Click  to move the selection to the **Selected** device window. The flux density defaults to kW/m<sup>2</sup> and the total flux defaults to MJ/m<sup>2</sup>. This can be changed by clicking the **Flux Density** or **Total Flux** box and selecting one of the other options.



- After selecting the sensor, click **Wiring Diagram** to see how the sensor is to be wired to the datalogger. The wiring diagram can be printed now or after more sensors are added.



- Select any other sensors you have, then finish the remaining *Short Cut* steps to complete the program. The remaining steps are outlined in *Short Cut Help*, which is accessed by clicking on **Help | Contents | Programming Steps**.
- If *LoggerNet*, *PC400*, *RTDAQ*, or *PC200W* is running on your PC, and the PC to datalogger connection is active, you can click **Finish** in *Short Cut* and you will be prompted to send the program just created to the datalogger.
- If the sensor is connected to the datalogger, as shown in the wiring diagram in step 4, check the output of the sensor in the datalogger support software data display to make sure it is making reasonable measurements.

## 5. Overview

The LI200RX measures incoming solar radiation with a silicon photovoltaic detector mounted in cosine-corrected head. The detector outputs current; a shunt resistor in the sensor cable converts the signal from current to voltage, allowing the LI200RX to be measured directly by Campbell Scientific dataloggers.

The LI200RX is calibrated against an Eppley Precision Spectral Pyranometer to accurately measure sun plus sky radiation. Do not use the LI200RX under vegetation or artificial lights because it is calibrated for the daylight spectrum (400 to 1100 nm). FIGURE 5-1 shows the pyranometer’s spectral response.

During the night, the LI200RX may read slightly negative incoming solar radiation. This negative signal is caused by RF noise. Negative values may be set to zero in the datalogger program.

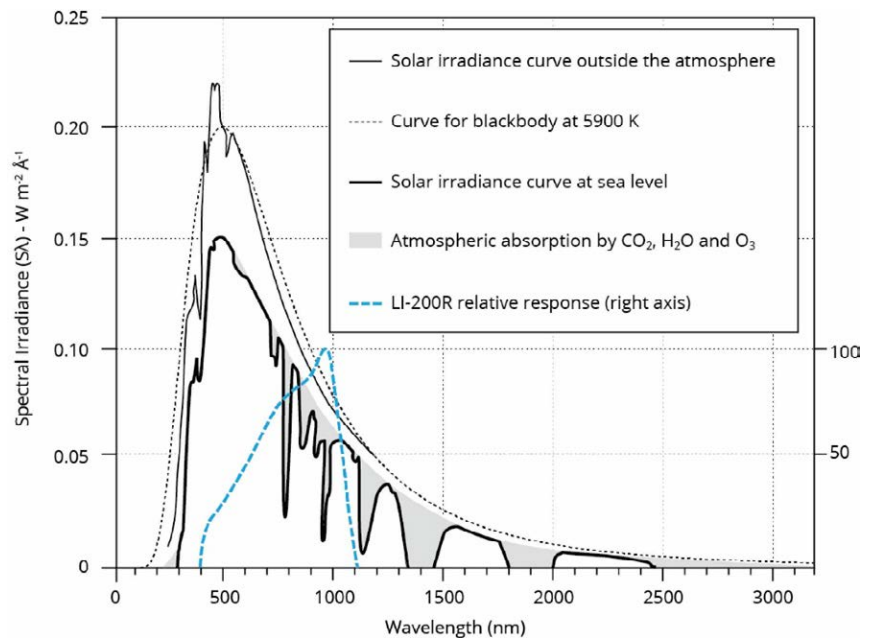


FIGURE 5-1. Pyranometer spectral response

The -L portion of the model number indicates that the LI200RX has a user-specified cable length. Its cables can terminate in:

- Pigtails that connect directly to a Campbell Scientific datalogger (cable termination option -PT).
- Connector that attaches to a prewired enclosure (cable termination option -PW).

For more theoretical information on the silicon photovoltaic detector see Kerr, J. P., G. W. Thurtell, and C. B. Tanner: 1967, "An integrating pyranometer for climatological observer stations and mesoscale networks", *J. Appl. Meteor.*, **6**, 688-694.

## 6. Specifications

### Features:

- Calibrated for the daylight spectrum (400 to 1100 nm)
- Completion circuit in its cable standardizes calibration, allowing complete sensors and cabling to be interchanged without altering multiplier and offset values
- Compatible with Campbell Scientific CRBasic dataloggers: CR300 series, CR6 series, CR800 series, CR1000, CR3000, CR5000, and CR9000(X)

**Stability:** < ±2% change over a 1 year period

**Response Time:** < 1 μs

**Cosine Correction:** Cosine corrected up to 82° angle of incidence

<b>Operating Temperature:</b>	–40 to 65 °C; the overmolding that protects the completion circuit in the cable of the LI200RX may crack if the temperature drops below –40 °C
<b>Temperature Dependence:</b>	±0.15% per °C maximum
<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>Diameter:</b>	2.36 cm (0.93 in)
<b>Height:</b>	3.63 cm (1.43 in)
<b>Weight:</b>	84 g (2.96 oz)
<b>Accuracy:</b>	Absolute error in natural daylight is ±5% maximum; ±3% typical
<b>Sensitivity:</b>	0.2 kW m <sup>-2</sup> mV <sup>-1</sup>
<b>Linearity:</b>	Maximum deviation of 1% up to 3000 W m <sup>-2</sup>
<b>Shunt Resistor:</b>	Adjustable, 40.2 to 90.2 Ω, factory set to give the above sensitivity
<b>Light Spectrum Waveband:</b>	400 to 1100 nm

## 7. Installation

If you are programming your datalogger with *Short Cut*, skip Section 7.3, *Wiring* (p. 10), and Section 7.4, *Programming* (p. 11). *Short Cut* does this work for you. See Section 4, *QuickStart* (p. 2), for a *Short Cut* tutorial.

### 7.1 Siting

The LI200RX should be mounted such that no shadows or reflections are cast on it by the tripod/tower or other sensors. The sensor should be mounted with the cable pointing towards the nearest magnetic pole. For example, in the Northern Hemisphere, point the cable toward the North Pole.

Mounting height is not critical for the accuracy of the measurement. However, pyranometers mounted at heights of 3 m or less are easier to level and clean.

## 7.2 Mounting to an Instrument Mount

### 7.2.1 Required Tools

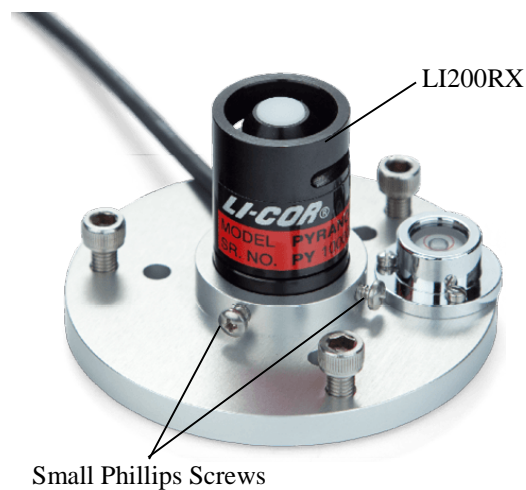
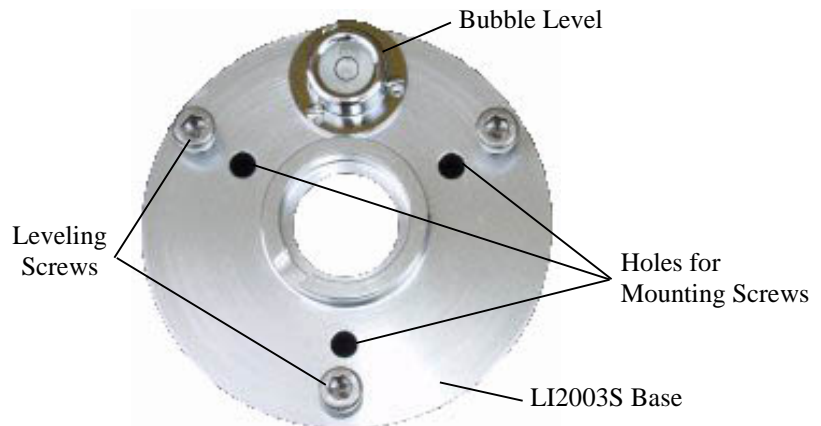
Tools required for installation on a tripod or tower:

- Small and medium Phillips screwdrivers
- 1/2-inch open-end wrench for CM225 or 015ARM
- Tape measure
- UV-resistant cable ties
- Side-cut pliers
- Compass
- Step ladder

### 7.2.2 Mounting Procedure

#### 7.2.2.1 LI2003S Mounting

The LI200RX must be mounted to the LI2003S to attach the sensor to the CM225 Solar Sensor Mounting Stand or the 015ARM Mounting Arm. To do this, place the LI200RX in the center of the LI2003S base/leveling fixture and secure the LI200RX to the LI2003S by tightening the small Phillips screws.

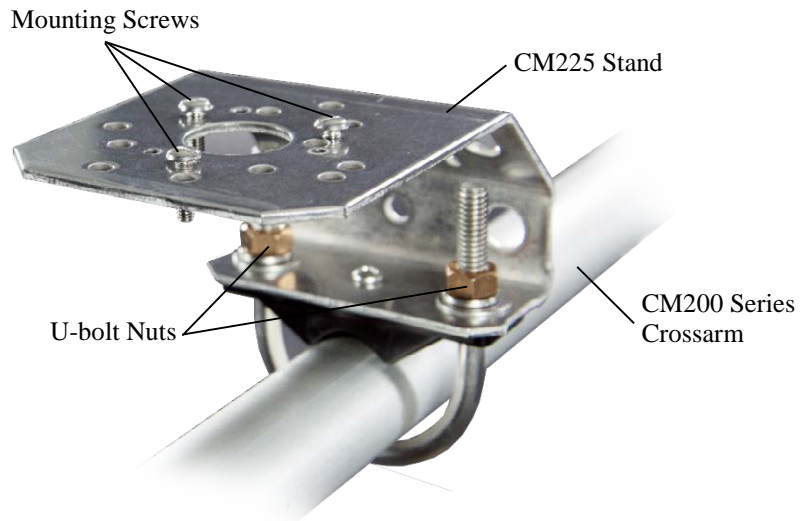


### 7.2.2.2 CM225 Solar Sensor Mounting Stand

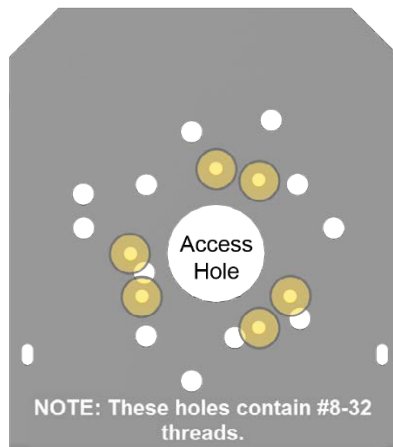
**CAUTION**

The CM225 should never be mounted directly to a vertical pipe. Instead the CM225 should be mounted to a crossarm. This avoids reflections from the vertical pipe onto the sensor.

1. Mount the crossarm to the tripod or the tower.
2. Place the CM225's U-bolt in the bottom holes and secure the CM225 to the crossarm by tightening the U-bolt nuts.



3. Loosely mount the LI2003S and LI200RX on the CM225. Do not fully tighten the three mounting screws.



Threaded mounting holes used with the LI200RX are indicated in yellow.

4. Turn the leveling screws as required to bring the bubble of the bubble level within the ring.
5. Tighten the mounting screws to secure the assembly in its final position. Check that the pyranometer is still correctly leveled and adjust as necessary.



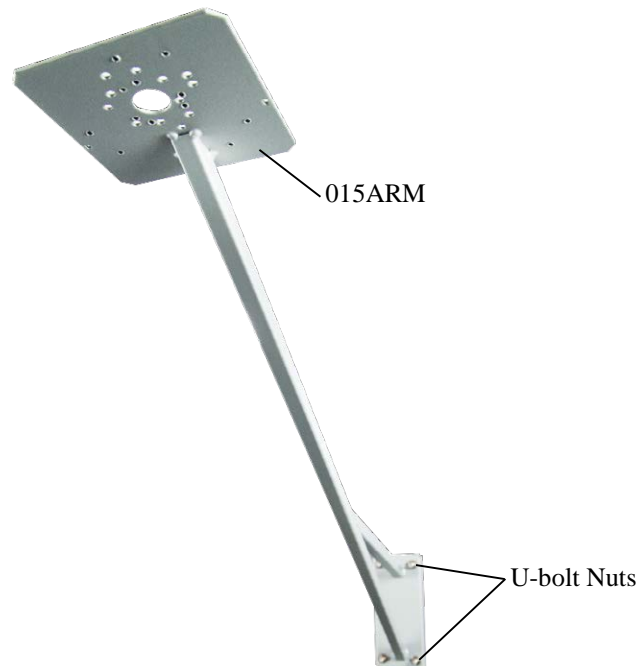
6. Route the sensor cable along the underside of the crossarm to the tripod/tower, and to the instrument enclosure.
7. Secure the cable to the crossarm and mast using cable ties.



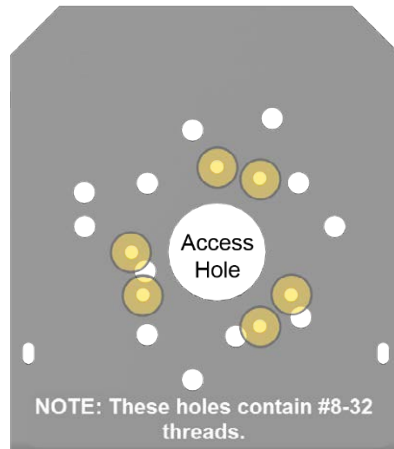
8. Remove the red cap after installing the sensor. Save this cap for shipping or storing the sensor.

### 7.2.2.3 015ARM

1. Secure the 015ARM to the mast by tightening the U-bolt nuts.



- Loosely mount the LI2003S and LI200RX on the 015ARM. Do not fully tighten the three mounting screws.



Threaded mounting holes used with the LI200RX are indicated in yellow.

- Turn the leveling screws as required to bring the bubble of the bubble level within the ring.
- Tighten the mounting screws to secure the assembly in its final position. Check that the pyranometer is still correctly leveled and adjust as necessary.
- Route the sensor cable along the underside of the 015ARM's arm to the tripod/tower, and to the instrument enclosure.
- Secure the cable to the mounting arm and mast using cable ties.
- Remove the red cap after installing the sensor. Save this cap for shipping or storing the sensor.

### 7.3 Wiring

A schematic diagram of the LI200RX is shown in FIGURE 7-1.

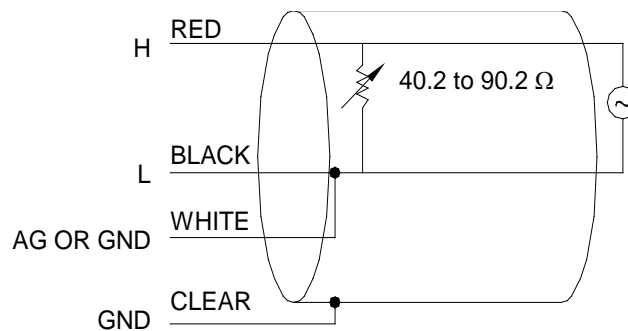


FIGURE 7-1. LI200RX schematic

Connections to Campbell Scientific dataloggers are given in TABLE 7-1. When *Short Cut* is used to create the datalogger program, the sensor should be wired to the channels shown in the wiring diagram created by *Short Cut*.

TABLE 7-1. Datalogger Connections for Differential Measurements		
Wire Color	Wire Function	Datalogger Connection Terminal
Red	Signal	U configured for differential high input <sup>1</sup> , <b>DIFF H</b> (differential high, analog-voltage input)
Black	Signal Reference	U configured for differential input low <sup>1</sup> , <b>DIFF L</b> (differential low, analog-voltage input)
White	Analog Ground	AG or $\perp$ (analog ground)
Clear	Shield	AG or $\perp$ (analog ground)
<sup>1</sup> U channels are automatically configured by the measurement instruction.		

## 7.4 Programming

*Short Cut* is the best source for up-to-date datalogger programming code. Programming code is needed when:

- Creating a program for a new datalogger installation
- Adding sensors to an existing datalogger program

If your data acquisition requirements are simple, you can probably create and maintain a datalogger program exclusively with *Short Cut*. If your data acquisition needs are more complex, the files that *Short Cut* creates are a great source for programming code to start a new program or add to an existing custom program.

### NOTE

*Short Cut* cannot edit programs after they are imported and edited in *CRBasic Editor*.

A *Short Cut* tutorial is available in Section 4, *QuickStart* (p. 2). If you wish to import *Short Cut* code into *CRBasic Editor* to create or add to a customized program, follow the procedure in Appendix A, *Importing Short Cut Code Into CRBasic Editor* (p. A-1). Programming basics for CRBasic dataloggers are provided in the following sections. Complete program examples for CRBasic dataloggers can be found in Appendix B, *Example Programs* (p. B-1). Programming basics and programming examples for Edlog dataloggers are provided at [www.campbellsci.com/old-manuals](http://www.campbellsci.com/old-manuals).

Output from the LI200RX is  $0.2 \text{ kW m}^{-2} \text{ mV}^{-1}$ , which is measured by the datalogger using the **VoltDiff()** CRBasic instruction. CRBasic is included in *PC400* and *LoggerNet* datalogger support software. The **VoltDiff()** instruction has the following structure:

```
VoltDiff(Dest, Reps, Range, DiffChan, RevDiff, SettlingTime,
Integ/FNotch, Mult, Offset)
```

Nearby ac power lines, electric pumps, or motors can be a source of electrical noise. If the sensor or datalogger is located in an electrically noisy environment, the measurement should be made with the 60 or 50 Hz rejection integration option as shown in CRBasic Example B-1, *CR1000 Program* (p. B-1).

Solar radiation can be reported as an average flux density ( $\text{W m}^{-2}$ ) or daily total flux density ( $\text{MJ m}^{-2}$ ). The appropriate multipliers are listed in TABLE 7-2. Programming examples are given for both average and daily total solar radiation. Negative values should be set to zero before being processed.

<b>TABLE 7-2. Multipliers Required for Average Flux and Total Flux Density in SI and English Units</b>		
<b>Units</b>	<b>Multiplier</b>	<b>Process</b>
$\text{W m}^{-2}$	200	Average
$\text{MJ m}^{-2}$	$t \cdot 0.0002$	Total
$\text{kJ m}^{-2}$	$t \cdot 0.2$	Total
$\text{cal cm}^{-2} \text{ min}^{-1}$	$0.2 \cdot (1.434)$	Average
$\text{cal cm}^{-2}$	$t \cdot 0.2 \cdot (0.0239)$	Total
t = datalogger execution interval in seconds		

### 7.4.1 Total Solar Radiation

If the solar radiation is totalized in units of  $\text{kJ m}^{-2}$ , there is a possibility of overranging the output limits. For CRBasic dataloggers, you can avoid this by using the IEEE4 or long data format.

## 8. Troubleshooting, Maintenance, and Calibration

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**NOTE** All factory repairs and recalibrations require a returned material authorization (RMA) and completion of the “Declaration of Hazardous Material and Decontamination” form. Refer to the [Assistance](#) page at the beginning of this document for more information.

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### 8.1 Troubleshooting

Symptom: -9999 or radiation values around 0

1. Check that the sensor is wired to the differential channel specified by the measurement instruction.
2. Verify that the range code is correct for the datalogger type.
3. Disconnect the sensor leads from the datalogger and use a DVM to check the voltage between the red (+) and the black (-) wires. The voltage should be 0 to 5 mV for 0 to  $1000 \text{ Wm}^{-2}$  radiation. No voltage indicates a problem with the photodiode, the cable, or the variable shunt resistor.

---

**CAUTION** Send in the entire sensor (not just the head) for repair.

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Symptom: Incorrect solar radiation

1. Make sure the top surface of the sensor head is clean, and that the sensor is properly leveled.
2. Verify that the range code, multiplier, and offset parameters are correct for the desired engineering units and datalogger type.

## 8.2 Maintenance

On a monthly basis, the level of the pyranometer should be checked. Keep the sensor clean and treat it as a scientific instrument to maintain the accuracy of the calibration. The vertical edge of the diffuser must be kept clean to maintain appropriate cosine correction.

Clean the sensor only with water and/or a mild detergent such as dishwashing soap. Vinegar can also be used to remove hard water deposits from the diffuser element if necessary.

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### CAUTION

Do not use alcohol, organic solvents, abrasives, or strong detergents to clean the diffuser element. Exposure to alcohol or organic solvents harm the acrylic materials of the sensor, which will adversely affect the cosine response of the sensor.

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## 8.3 Calibration

Recalibrate the LI200RX every two years.

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### CAUTION

Send in the entire sensor (not just the head) for recalibration.

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LI200RX pyranometers output a current that is proportional to the incoming solar radiation. Each LI200RX has a unique calibration factor. A variable shunt resistor in the cable converts the current to the voltage measured by the datalogger. Campbell Scientific sets the shunt resistor so that the pyranometer outputs  $5 \text{ mV kW}^{-1} \text{ m}^2$ .

The resistor value is found using Ohms law. The resistance is found by dividing the desired output voltage by the calibrated current output. For example, a pyranometer with a calibration of  $92 \text{ } \mu\text{A kW}^{-1} \text{ m}^2$ , will have the resistor set to:

$$54.35 \text{ } \Omega = 5 \text{ mV kW}^{-1} \text{ m}^2 / 0.092 \text{ mA kW}^{-1} \text{ m}^2$$

## 9. Acknowledgements

Campbell Scientific, Inc. gratefully acknowledges the contribution of LI-COR® to concepts, text, and images used in this manual.



# Appendix A. Importing Short Cut Code Into CRBasic Editor

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This tutorial shows:

- How to import a *Short Cut* program into a program editor for additional refinement
- How to import a wiring diagram from *Short Cut* into the comments of a custom program

*Short Cut* creates files, which can be imported into *CRBasic Editor*. Assuming defaults were used when *Short Cut* was installed, these files reside in the C:\campbellsci\SCWin folder:

- .DEF (wiring and memory usage information)
- .CR300 (CR300-series datalogger code)
- .CR6 (CR6-series datalogger code)
- .CR8 (CR800-series datalogger code)
- .CR1 (CR1000 datalogger code)
- .CR3 (CR3000 datalogger code)
- .CR5 (CR5000 datalogger code)
- .CR9 (CR9000 datalogger code)

Use the following procedure to import *Short Cut* code and wiring diagram into *CRBasic Editor*.

1. Create the *Short Cut* program following the procedure in Section 4, *QuickStart* (p. 2). Finish the program and exit *Short Cut*. Make note of the file name used when saving the *Short Cut* program.
2. Open *CRBasic Editor*.
3. Click **File** | **Open**. Assuming the default paths were used when *Short Cut* was installed, navigate to C:\CampbellSci\SCWin folder. The file of interest has the .CR300, .CR6, .CR8, .CR1, .CR3, .CR5, or .CR9 extension. Select the file and click **Open**.
4. Immediately save the file in a folder different from C:\Campbellsci\SCWin, or save the file with a different file name.

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## NOTE

Once the file is edited with *CRBasic Editor*, *Short Cut* can no longer be used to edit the datalogger program. Change the name of the program file or move it, or *Short Cut* may overwrite it next time it is used.

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5. The program can now be edited, saved, and sent to the datalogger.
6. Import wiring information to the program by opening the associated .DEF file. Copy and paste the section beginning with heading “-Wiring for CRXXX-” into the *CRBasic* program, usually at the head of the file. After pasting, edit the information such that an apostrophe (') begins each line. This character instructs the datalogger compiler to ignore the line when compiling.





# Appendix B. Example Programs

The following programs measure the LI200RX every 10 seconds, and converts the mV output to  $Wm^{-2}$  and  $MJ m^{-2}$ . The programs output an hourly average flux ( $Wm^{-2}$ ) and a daily total flux density ( $MJm^{-2}$ ). Negative values are set to zero before being processed. Wiring for the examples is given in TABLE B-1.

Color	Description	CR1000	CR6
Red	Signal	1H	U1
Black	Signal Reference	1L	U2
White	Analog Ground	⊥	⊥
Clear	Shield	⊥	⊥

## B.1 Example CR1000 Program

```

CRBasic Example B-1. CR1000 Program

'CR1000

'Declare Variables and Units
Public S1rW
Public S1rMJ

Units S1rW=W/m2
Units S1rMJ=MJ/m2

'Define Data Tables
DataTable(Table1,True,-1)
  DataInterval(0,60,Min,10)
  Average(1,S1rW,FP2,False)
EndTable

DataTable(Table2,True,-1)
  DataInterval(0,1440,Min,10)
  Totalize(1,S1rMJ,IEEE4,False)
EndTable

'Main Program
BeginProg
  Scan(10,Sec,1,0)

  'measure the LI200RX
  VoltDiff(S1rW,1,mV7_5,1,True,0,_60Hz,1,0) 'use 20mV range for
  'CR5000 and CR3000

  'set negative values to zero
  If S1rW<0 Then S1rW=0

  'convert mV to MJ/m2 for 10 second execution interval
  S1rMJ=S1rW*0.002

  'convert mV to W/m2
  S1rW=S1rW*200.0

```

```

'Call Data Tables and Store Data
CallTable(Table1)
CallTable(Table2)
NextScan
EndProg

```

## B.2 Example CR6 Program

### CRBasic Example B-2. CR6 Program

```

'CR6 Series

'Declare Variables and Units
Public BattV
Public PTemp_C
Public S1rW
Public S1rMJ

Units BattV=Volts
Units PTemp_C=Deg C
Units S1rW=W/m^2
Units S1rMJ=MJ/m^2

'Define Data Tables
DataTable(Table1,True,-1)
  DataInterval(0,60,Min,10)
  Average(1,S1rW,FP2,False)
EndTable

DataTable(Table2,True,-1)
  DataInterval(0,1440,Min,10)
  Minimum(1,BattV,FP2,False,False)
  Totalize(1,S1rMJ,IEEE4,False)
EndTable

'Main Program
BeginProg
  'Main Scan
  Scan(10,Sec,1,0)
  'Default Datalogger Battery Voltage measurement 'BattV'
  Battery(BattV)

  'Default Wiring Panel Temperature measurement 'PTemp_C'
  PanelTemp(PTemp_C,60)

  'LI200RX Pyranometer measurements 'S1rMJ' and 'S1rW'
  'Measurement returns S1rW in millivolts.
  VoltDiff(S1rW,1,mV200,U1,True,0,60,1,0)

  'Set negative value to zero.
  If S1rW<0 Then S1rW=0

  'Convert millivolts to Megajoules/m^2.
  S1rMJ=S1rW*0.002

  'Convert millivolts to Watts/m^2
  S1rW=S1rW*200

  'Call Data Tables and Store Data
  CallTable Table1
  CallTable Table2
NextScan
EndProg

```



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