Amplifying the Output Signal from LI-COR Radiation Sensors

LI-COR Technical Solutions

Amplification of the output from a LI-COR light sensor may be necessary due to the requirements of a user's data logging device. The first thing to research is the resolution of the data logger. LI-COR sensors output a very small current signal (in the microAmps range). A data logger needs to have the capability to measure down into the picoAmps range. However, many data loggers do not have this capability, especially for measuring current. As an alternative, the sensor's signal can be converted to a millivolt output, in the range of 0-25 millivolts, when used with a resistor. In this case, it is important that the data logger has the ability to measure down to the microvolts resolution.

Check the specifications of the datalogger to determine if an amplified signal is required.

1. Can it measure current or can it only measure voltage?
2. Can the range of the datalogger's channels be changed? For example, we suggest programming the input range from 0 to 25 millivolts.
3. Confirm that the voltage channels will also measure down to 0.001 millivolts (or down to the microvolts level).

If the data logger does not have these capabilities, we recommend using the LI-COR 2420 amplifier. The 2420 Light Sensor Amplifier converts the µA current from a light sensor into a voltage that can be measured by most data loggers and system controllers. The 2420 Amplifier provides 15 user-selectable gain settings to accommodate a variety of applications and has two configurations to support light sensors with both BNC and bare lead connections.

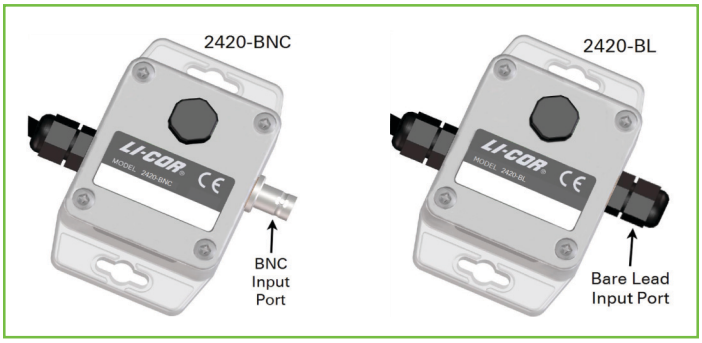

Figure 1. *The 2420 Amplifier supports light sensors with both BNC and bare lead connections.*

If the data logger requires a current loop output, the EME Systems UCLC is a special purpose amplifier that converts the micro-amp level current output of LI-COR light sensors to an industry standard current-loop level. The UCLC can be configured at EME Systems or by the end user for any one of three standard LI-COR sensors and any one of two popular current loop levels. The UCLC provides a simple interface between LI-COR sensors and current loop signal processing equipment including data loggers, meters, industrial control equipment, HVAC, and greenhouse control systems. Alternate settings are available by special order. The calibration sheet provided with each LI-COR sensor, in conjunction with the UCLC gain setting, can be used to compute the light level incident on the sensor with a high degree of accuracy.

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