Need to create a system to record data from a sensor that measures light (specifically photosynthetically active radiation - PAR) - a LI-COR “Quantum” sensor. The sensor has a current signal that will be used to drive a transconductance amplifier with a gain such that the signal will be between 0 and 5 volts.

System features:

Battery powered – might want to use the mini Arduino pro since it draws less current than the Uno.

Needs the following modules:

* Sensor
* Amplifier
* Microprocessor
* SD card for recording light measurement.
* Real time clock for recording time and date.

Simple program flow (w/o interrupts)

Configure:

Assign pins for reading clock, reading light sensor input, and writing data to the SD card.

Assign variables for measurement interval (nominally 12 seconds) and averaging window (nominally 12 minutes).

When calculating successive values, a new value comes into the sum and an old value drops out, meaning a full summation each time is unnecessary for this simple case,

\textit{SMA}_\mathrm{today} = \textit{SMA}_\mathrm{yesterday} - {p_{M-n} \over n} + {p_{M} \over n}

Configure other variable like counters.

Loop:

Check millis since last event.

If time for the next event:

Capture Analog signal

Convert from raw signal to radiation unit-of-measure

Incorporate into moving average.

Reset analogMeasurementCounter

If time to record data

Capture date/time from RTC

Record date/time and radiationLevel to SD card

Reset dataLogCounter