



Manual for Measurements with Campbell Scientific Dataloggers

Parts needed:

Power:

Small 12V battery	Terminals, wires, and power adapter for CR1000 datalogger

Datalogger and Sensors:

	
CR1000 Datalogger. Handle with care!	Licor 200SZ Pyranometer with 100 Ohm Resistor
USB 2 Serial Cable	More sensors as needed

Mounts, tools (Voltmeter, flat head screwdriver, wires, adjustable wrench, as needed)

Prepare and test program:

Thoroughly testing a datalogger program in the lab is crucial to a successful deployment. Using the LoggerNet - CRBasic software, we can edit the datalogger program and instructions for each sensor. Some of the instructions for basic sensors can be determined using the Short Cut Tool on the LoggerNet program menu, for others we have to manually write or search for the instructions online (see table).

Sensors	T107_C	CS215	Li200X	IRR-P	DavisWind	NR-lite	Soilheatflux
Shortcuts	Yes	Yes	Yes	No	No	Yes	yes

To test the program use the compile option in the CRBasic window, which will indicate some (but not all) errors. The program is now ready to be transferred to the datalogger for data collection.

Wiring:

Connect each sensor to the datalogger (CR1000) using the wiring instruction found in the wiring section at the end of the datalogger program. It is very important to confirm the correct datalogger ports, when wiring the sensors. Tighten each screw to avoid accidental disconnecting which would result in a loss of data.

Sensor specific mounting requirements:

- Air temperature and humidity sensors must be placed in radiation shield and should be at z= 2m

- Solar radiation sensors should be level and unobstructed by building, tripod, or sensor, shadows etc. This can usually be avoided by pointing them to the south side of the tripod. Sensor-specific calibration constant must be entered in datalogger program.
- Wind sensor should be mounted as high as possible
- Infrared radiometer for surface temperature (IRR-P) must be pointing to the roof (or the area of interest). Sensor-specific calibration constant must be entered in datalogger program.
- Rain gauge should be level on the ground or on a post away from the tower.

Confirming Proper Operation:

In order to confirm the proper operation of the program and all the sensors, connect the computer to the datalogger using a serial cable, click on 'connect' button from the menu. Check the connection first then load the program to the datalogger. Check the instantaneous readings for all the sensors by clicking on the 'Numeric' in the data displays window. For trouble shooting check the wiring and the ports you choose in your datalogger program for each sensor.

Possible reasons for failed connection Computer – Datalogger:

- **Datalogger does not have power:** check voltage across the wires going into the datalogger power connector. If $U < 11.8$ V exchange and charge battery. Confirm polarity of wires.
- **Incorrect COM port:** Go to Loggernet – Setup window. Go to 'ComPort' and click on the pull-down menu in Hardware – Com Port Connection. Set another COM port in the pull down menu and try to reconnect in the Loggernet – Connect window. If all these COM ports file check the COM port assigned to the USB 2 Serial cable in Windows – Settings – Control Panel – Administrative Tools – Computer Management – Device Manager – Ports
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