

CR1000 Data Loggers

From labwiki

Here is a quick outline for using the CR1000 Data Loggers.

Setting up the CR1000

STEP-BY-STEP:

1. Collect as many thermocouple wires as you'll need, along with the CR1000 and a PS100 power supply.
2. The PS100 battery should be charged using the PN9591 voltage regulator, with the two wire firmly screwed in to the two "Charge" bays on the PS100.
3. Connect the CR1000 to the PS100 using either the battery out or the 12V/G connections. The 12V/G connections only transmit power when the PS100 is plugged in.
4. Connect the CR1000 to the computer using a computer interface cable and open the PC200W Datalogger Support Software.
5. If the CR1000 is receiving power, and the computer plug is correctly attached, pressing the Connect button in the PC200W software should connect the device.

NOTE: If the PS100 is charged, connected the CR1000 power wires to the battery lines of the PS100 will immediately begin draining power from the PS100 battery. The switch on the PS100 controls the sending of power the 12V/G lines, not the battery out. If you leave the CR1000 connected to the PS100 battery lines in between experiments, the PS100 will be drained.

6. The red circular button at the top of the software (Create Program via Short Cut) can be used to design a data logging regime.
7. Press New Program in the Short Cut application window to begin designing a new setup.
8. Follow through the instructions and settings using the "Next" button in the bottom right corner until you get to "3. Sensors".
9. Under the "Temperature" folder, look for "105T (copper-constantan) Thermocouple", these are the thermocouples currently (April 2014) in the lab.
10. Use the "arrow" button between the two windows to add 105T Thermocouples to the sensor setup, up to 8 thermocouples can be connected for each CR1000 module.
11. Click next when you have added the correct number of 105T Thermocouples.
12. Now setup tables which the data from your program will be recorded in to. By default the software sets up two empty tables (you can see the table tabs on the bottom of the right window).
13. Add any of the Thermocouples you'd like to record to the table window, and set how frequently you'd like to store the data. Clicking "Average" will record the Average temperature to the table with whatever frequency you set. Once the tables are setup, click "wiring diagram" on the lefthand side to view a schematic for how to connect the thermocouples to the CR1000 module. The colours refer to the colour of plastic surrounding the fine metal wires. Once you've connected all of your wires, click Finish. Save your program.
14. You will be prompted with a popup asking if you'd like to send the program to the datalogger. Click "Yes" and the program will be sent to the datalogger and compiled after filling out some options.
15. If the "Run Now" box was checked when the program was sent to the CR1000, the datalogger is now recording. Confirm that data is being read by all thermocouples by viewing the "Monitor Data" tab in the main PC200W window. You may need to add tables to monitor to the spreadsheet layout. Thermocouples that are properly connected will display temperatures, those which are not will display NaN.

16. Set up the CR1000 datalogger for your experiment, and confirm once again that all thermocouples are recording using the handheld CR1000KD device. This device will turn on automatically when connected to the CR1000. Click "Graph/5" to view dynamic tables.

NOTES: It seems like the CR1000KD handheld device will turn on EVEN IF the CR1000 is connected to an uncharged PS100 unit. Confirm that tables are being updated to make sure that the PS100 is providing power.

The blue lead line can be used together with the finer thermocouples by simply wrapping each end of the fine thermocouple around the corresponding wire of the lead line.

It is a good idea to periodically check your thermocouple connections using the CR1000KD device, especially if you are using the thick blue lead line to elongate the thermocouple length.

Downloading Data

STEP-BY-STEP:

1. Connect the CR1000 to the computer and make sure the CR1000 is connected to a PS100 power supply.
2. Navigate to the "Collect Data" tab in the PC200W main window.
3. Click "Collect Data", and note which tables you are downloading/where they are being saved (as *.dat files).
4. There is an R script on the QNAP written for importing these files into R (QNAP://Tasker/R/CR1000_Import.R). Check the script for any pre-processing of the *.dat file you may need to do.

NOTES: The header that the PC200W software gives these *.dat files is complicated... Use R or even just a text editor to make the names informative before leaving to make sure that you can remember.

Alternatively, you can intelligently name the table columns during creation of the program (if you know where each thermocouple will be setup/what each will be monitoring - though this is often impossible or very hard to predict).

For the preliminary microclimate data experiments, positions of each thermocouple were recorded after the experiment was setup. As soon as data was downloaded, the header for each *.dat file was edited to be informative.

Currently the only computer with the PC200W software installed is the computer in the "alcove", with the scanner and 3D scanner.

Other Resources

Campbell Scientific has a fairly useful support website, where additional documentation is available [1] (<http://www.campbellsci.ca/cr1000-support>).

The manual shipped with the Loggers is in the box they came in, in the cabinet directly to the left of the dissecting microscope in the main room of the lab.

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