

# Calibration and Lab Tests

## Lab Guide

### Task

Verify that the data logger and sensors are operating normally.

### What You Need

- Data logger assembly and cables
- Calibration thermometer
- Warm water (~50° C), Un-insulated cup, Ice

### In the Lab

1. Record Sensor Bias – This test verifies that all four channels are recording the same approximate temperature by collecting data for a few minutes with all four sensors grouped together measuring air temperature. The bias or difference between each sensor should be less than 1° C.

- a. Plug each sensor into the appropriate socket and place all four sensor tips together and away from any sources of heat (like a sunny spot).

- b. Connect the logger to the serial cable.

- c. Confirm that your computer's clock is showing the current local time.

- d. Double click on the Boxcar® icon to run this software.

- e. Select “Launch” (Ctrl L) under the “Logger” button on the main menu bar.

- f. Change the file “Description” from “TEST” to “Day1bias”.

- g. Change the “Interval” to “6 sec”

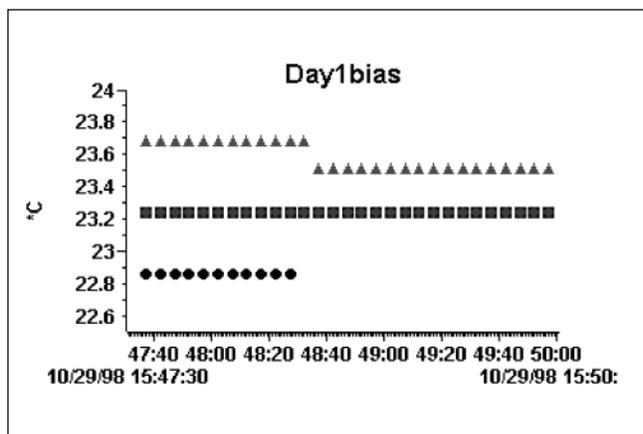
- h. Select the “Start” button, message should indicate the “program” is being loaded.

- i. Wait 3 minutes. The data logger should be working!

- j. Select “Readout” (Ctrl R) under the “Logger” button on the main menu bar.

- k. Screen should indicate the data is being “Downloaded”, then prompt you for a filename. The default should be Day1bias.dtf

- l. Use View, Display Options to look at each temperature channel separately.



- m. Record the average value from each channel in your GLOBE Science Log , they should be within 1° C of each other.
- n. Make sure that you understand the time axis scale and that it is showing the correct time and date and how to save the data to an Excel file.

2. Full Range Calibration

- a. Place the four temperature sensors in a half-full, non-insulated cup of warm water (~50° C).
- b. Connect the logger to the serial cable.
- c. Confirm that your computer’s clock is showing the current local time.
- d. Select “Launch” under the “Logger” button on the main menu bar.
- e. Set the file “Description” to “CAyymmdd”, where yymmdd is today’s year, month and day.
- f. Set the “Interval” to “5 min” and launch the logger with a delayed start at the next regular 5 minute time mark (example: its now 10:17:00. So set the delayed start for 10:20:00).
- g. Record the calibration thermometer temperature every 5 min in conjunction with the loggers sampling time.
- h. After the temperature change slows to 1° C/5 min, add ice cubes and continue until the water approaches freezing.

