Physical Oceanographic Mooring Time Series Protocol
Meteorological Station
Moorea Coral Reef LTER

By K.Seydel, 12 January 2010

CS100 Barometric Pressure Sensor

Recalibration: Contact Campbell Scientific, Inc. for an RMA # before returning sensor for recalibration. You may also return the unit directly to Setra for recalibration.

Caution: CS100 is sensitive to static when the backplate is removed. To avoid damage, take adequate anti-static measures when handling.

Maintenance: Since the sensor is semi-sealed, minimum maintenance is required:

1. Visually inspect the cable connection to ensure it is clean and dry.
2. Visually inspect the casing for damage.
3. Ensure that the pneumatic connection and pipe are secure and undamaged.

The external case can be cleaned with a damp, lint-free cloth and a mild detergent solution.

To protect from condensation, desiccant should be changed at regular intervals.

LI200X Pyranometer

Recalibration: Every 2 years. Obtain an RMA # before returning to Campbell Scientific.

Maintenance: Level of pyranometer should be checked monthly. Dust and debris on sensor head and drain hole should be removed carefully.

CSI Model TB4 Rain Gage

Recalibration: Every year as follows:

1. Remove housing assembly.
2. Check bubble level to verify rain gage is level.
3. Pour water through inner funnel to wet the two bucket surfaces. Using a graduated cylinder, slowly pour 314 cc (19.16 in^3) of water, over 15 minutes, into collection funnel. Volume=0.39 inches of rainfall.
4. After water has passed through, the tipping bucket should have tipped 39 times.
5. If not, return for recalibration.

*Factory recalibration not required unless damaged or adjustment screws loose.

Maintenance: During each site visit, remove any debris. Verify the tipping bucket moves freely, and that the datalogger records 0.01 inches for each bucket tip.

Model HMP45C Temperature and Relative Humidity Probe

Recalibration: Every year. Obtain RMA # and return to Campbell Scientific

Maintenance: Minimal. Check monthly that the radiation shield is free from debris. The Black shield at end of sensor should also be checked for contaminates.

Proximity to ocean: A buildup of salt on the filter or chip will delay or destroy response to atmospheric humidity because NaCl has affinity for water.

05103 R.M. Young Wind Monitors

Recalibration: Not required, but periodic calibration checks are desirable. (See next page for details).

Maintenance: Anemometer bearings and potentiometer should be inspected at least every 2 years.

Accurate wind direction calibration requires a Model 18112 Vane Angle Bench Stand. Begin by connecting the instrument to a signal conditioning circuit which has some method of indicating wind direction value. This may be a display which shows wind direction values in angular degrees or simply a voltmeter monitoring the output. Orient the base so the junction box faces due south. Visually align the vane with the crossmarkings and observe the indicator output. If the vane position and indicator do not agree within 5°, adjust the potentiometer coupling inside the main housing. Details for making this adjustment appear in the MAINTENANCE, POTENTIOMETER REPLACEMENT, outline, step 7.

It is important to note that, while the sensor mechanically rotates through 360°, the full scale wind direction signal from the signal conditioning occurs at 355°. The signal conditioning electronics must be adjusted accordingly. For example, in a circuit where 0 to 1.000 VDC represents 0° to 360°, the output must be adjusted for 0.986 VDC when the instrument is at 355°. (355°/360° X 1.000 volts = 0.986 volts)

Wind speed calibration is determined by propeller pitch and the output characteristics of the transducer. Calibration formulas showing wind speed vs. propeller rpm and output frequency are included below. Standard accuracy is ± 0.3 m/s (0.6mph). For greater accuracy, the sensor must be individually calibrated in comparison with a wind speed standard. Contact the factory or your supplier to schedule a NIST (National Institute of Standards & Technology) traceable wind tunnel calibration in our facility.

To calibrate wind system electronics using a signal from the instrument, temporarily remove the propeller and connect an Anemometer Drive to the propeller shaft. Apply the appropriate calibration formula to the calibrating motor rpm and adjust the electronics for the proper value. For example, with the propeller shaft turning at 3600 rpm adjust an indicator to display 17.6 meters per second [3600 rpm X 0.00490 (m/s)/rpm =17.6 m/s]

<u>Calibration Formulas:</u>
WIND SPEED vs PROPELLER RPM
m/s = 0.00490 x rpm
knots = 0.00952 x rpm
mph = 0.01096 x rpm
km/h = 0.01764 x rpm

WIND SPEED vs OUTPUT FREQUENCY
m/s = 0.0980 x Hz
knots = 0.1904 x Hz
mph = 0.2192 x Hz
km/h = 0.3528 x Hz