

SOP 1: CTD Maintenance, Storage and Calibration

Version 1

Revision History Log:

Prev. Version #	Revision Date	Author	Changes Made	New Version #
[none]	Oct. 2010	S. Danielson, W. Johnson, L. Sharman, G. Eckert, B. Moynahan	Initial version	1

1.0 CTD Maintenance, Supplies and General Handling Procedures

1.1 General CTD Handling, Care, and Use Instructions

The Sea-Bird SBE-19 and SBE-19plus operators' manuals (available on the SEAN and Sea-Bird websites) document all recommended practices for cleaning the CTD, accessing the battery compartment, care and installation of o-rings, instrument operation, instrument setup and CTD-computer communications. The Project Leader will read and become comfortable with all aspects of the manual.

Within a cruise and between casts (assuming no more than a day between casts), the plumbed line connecting the pump and sensors should be flushed with 0.1% Triton X-100 solution, followed by distilled water, as described in SBE Application Notes 34, 2D, and 64 (http://www.seabird.com/application_notes). (Note: Triton X-100 is a non-ionic biogenic detergent; be careful not to get the solution in your eyes or on your skin.) Normally the conductivity cell is kept wetted by keeping the syringe/Tygon tubing assembly attached to the temperature/conductivity intake duct fitting between casts. In very cold conditions, however, special care must be taken to protect the instrument from freezing, and one precaution is to disconnect the tubing assembly after flushing to allow drainage (then reconnect "dry"). This is particularly important during the winter (December–January) cruise when one or more nights may be spent in the field. The instrument should be stored in a heated space aboard the survey vessel overnight (in which case the tubing assembly can remain connected). For longer-term storage between cruises, see section 2 below.

1.2 Supplies

On an ongoing basis, all field gear should be assessed and repaired or replaced as needed. Necessary equipment and supplies include but are not limited to the CTD lowering line, spare CTD and GPS batteries, the computer-to-CTD interface cable, spare o-rings, electrical silicone grease, distilled water, Triton X-100 solution, and bleach solution. A supply of KimWipes or other similar non abrasive lint-free wiping towel is necessary for proper o-ring handling.

2.0 Long-term Storage

2.1 Instrument Cleaning

Cleaning the CTD after each cruise is important to maintain sensor viability and reduce the potential for the negative effects of biofouling, contamination by oil, and buildup of salt crystals on the sensors, especially the relatively sensitive and delicate conductivity cell and oxygen sensor. Again, refer to SBE Application Notes 34, 2D, and 64 (http://www.seabird.com/application_notes) for detailed long-term cleaning/storage instructions. Rinse the entire instrument thoroughly with fresh water.

Disconnect the tubing connecting the DO sensor so that it is not exposed to the conductivity cell cleaning procedure. Flush the conductivity cell with a 0.1% solution of Triton X-100. Wash the solution back and forth with the syringe. Allow the cell to soak in the solution for 60 minutes. Drain the cell and tubing. Thoroughly rinse the unit with clean water for 5 minutes; any residual salt crystals can damage the cell. Sea-Bird cautions not to use a brush or Q-tip to clean the flow tube on the conductivity cell, as this can alter the calibration or damage the sensor.

After treating the conductivity cell as above, implement the following procedure to prepare the (now disconnected) DO sensor for long-term storage between cruises. Using the syringe, flush the sensor for 1 minute with a 1% (vs. 0.1%) Triton X-100 solution preferably warmed to 30°C (86°F). Drain and flush with warm (not hot) fresh water for 5 minutes. Soak the sensor for 1 minute in a 500–1000 ppm solution of bleach; after the soak drain and flush with warm (not hot) fresh water for 5 minutes. Assuming there is no danger of freezing, connect the sensor inlet and outlet with a short loop of Tygon tubing. Place a small piece of clean sponge — slightly dampened with fresh, clean water — in the center of the tubing (not near the sensor membrane).

2.2 Storage

After the conductivity cell is thoroughly dry from its last cleaning, store by re-attaching the syringe assembly to seal the dry cell. For long-term storage, keep the DO sensor isolated with its closed tubing loop. *Remember, however, to remove the loop and reconnect the DO sensor to the in-line tubing train on the CTD just before redeploying the instrument on the first cast of the next cruise!*

3.0 Factory Calibrations

Immediately after each October cruise, send the entire CTD instrument to Sea-Bird Electronics for calibration of all sensors. Sea-Bird will ensure the third-party ancillary sensors are also calibrated at the originator's factory and returned in a timely fashion. Be sure to get an RMA number from Sea-Bird before shipping the CTD to them. Include a completed Sea-Bird Service Request Form in the shipping crate. Ship the CTD via FedEx, and make sure the RMA number is written on the address label somewhere. Email the serial number of the instrument to Sea-Bird in advance. Sea-Bird shipping information is as follows.

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1808 136th Place NE	Fax: (425) 643-9554	Dave Armstrong, Andy
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Sea-Bird's website also has return information at: www.seabird.com