Using the SBE 911plus CTD with General Oceanics Rosette™

The Sea-Bird SBE 911*plus* CTD system is electrically and mechanically compatible with standard, unmodified Rosette water samplers made by General Oceanics (G-O). The SBE 911*plus* can be ordered with the optional modem and Rosette interfaces. These items allow the SBE 911*plus* to control the operation of the Rosette directly and without interrupting the data from the CTD. Use of the SBE 911*plus* this way eliminates the need for the G-O deck box.

Mechanical Interface

Vertical mounting of the CTD to the Rosette pylon is shown in Figure 1. The CTD underwater unit (SBE 9) is removed from its stainless-steel guard cage and a special clamp (Sea-Bird #24083, General Oceanics# C1015-SB-2) is fixed just under the CTD's top end cap flange. Four heavy threaded rods pass through this clamp and secure the CTD assembly to the Rosette's lower bottle plate. An extension stand must be used to provide sufficient height to protect the CTD sensors when the Rosette is on deck. Consult General Oceanics for the extension stand appropriate for your Rosette. Note that the CTD will be in the wake of the Rosette during the upcast; the Rosette will modify the temperature of the water as it passes through, and the CTD will respond accordingly. Optimum data quality cannot be obtained under these conditions, and only the downcast data should be used. If the TC Duct is used, the plumbing connections are the same as without the Rosette.

Horizontal mounting of the CTD may be feasible where the Rosette frame is of sufficient diameter (Figure 2). A somewhat smaller diameter will suffice if the CTD is removed from its cage and mounted with suitable clamps. Notice that the pump position is altered and the return tubing is not used. In the horizontal configuration there is no vertical component to the water in the system. This makes the system inherently insensitive to a ship's motion-induced vertical accelerations. By positioning the TC Duct intake close to the Rosette frame's periphery and out of the wake of the pylon/bottle assembly, it may be possible to obtain good upcast data in addition to downcast data.

Electrical Interface

The SBE 9*plus* is connected to the G-O Rosette using a three-pin jumper cable (P/N 17196, reverse polarity cable). When using this cable, the switch in the Rosette pylon should be set for reverse polarity. It is possible to use a Rosette set for normal polarity by connecting a different cable (P/N 17533, normal polarity cable) between the G-O pylon and the CTD Rosette connector.
Note that with the SBE 9*plus* there is no Y-cable between the sea cable termination, the CTD, and the Rosette, as is used with older SBE 9 systems and EG&G CTDs. The sea cable is connected directly to the CTD at connector JT1. A jumper cable is then used between CTD connector JT4 and the connector on the Rosette pylon. (See SBE drawing no. 50076 or 50077 and figure 3)

CTD/Rosette Operation

The bottles on the Rosette can be fired three ways.

1. During the display of real time data using the Seasave software, function keys [CTRL] F3 can be used to enable and fire bottles if the computer serial port is connected to the modem port on the SBE 11*plus*.
2. The buttons on the front panel of the Deck Unit can be used in a similar manner, whether or not the computer has its serial port connected to the modem port.
3. Connect a second computer to the modem communications port on the SBE 11*plus* and use the program TMODEM to control the Rosette operation.

WARNING

If the Rosette pylon has been enabled, turning off the deck unit power will cause the pylon to fire. This situation can cause bottles to trip in unexpected locations. Tripping a bottle on deck may be hazardous.

If the bottle has been enabled, sending a fire signal will immediately close the enabled bottle on the Rosette. If the bottle has not been enabled, sending a fire command will initiate a 15-second arming sequence followed by the firing of the bottle.

When the SBE 9*plus* underwater unit detects a bottle confirmation from the G-O Rosette:
1. it sends a confirm message to the computer connected to the modem port, and
2. it sets a bit high in the modulo word for 1.5 sec. The confirm bit is a permanent mark in the CTD data stream for later ID and processing of the Rosette bottle data and is used by Seasave to keep track of the number of bottles fired.

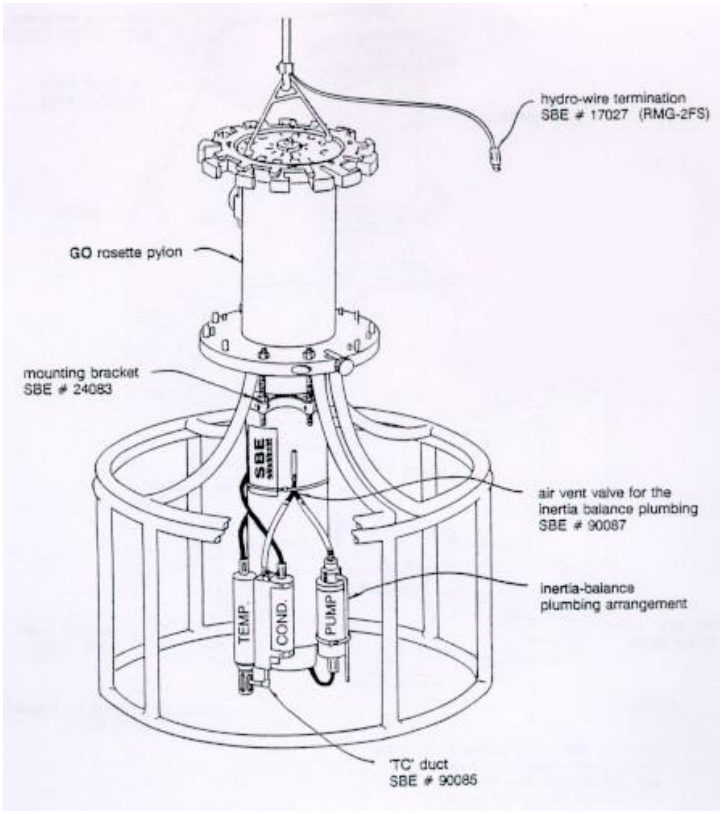

Figure 1

Vertical mounting of the SBE 9 CTD to the General Oceanics Rosette pylon

The CTD is removed from the SBE guard cage and the CTD top end bolted to the bottom of the pylon with a special mounting bracket (SBE #24083). In this figure, inertia-balanced plumbing has been installed; the pump is mounted with the pump head up and connected to the conductivity cell through an air vent valve (SBE #90087). The filter and orifice assembly, normally between the conductivity cell and pump, has been removed. In addition, the TC Duct has been installed on the sensing end of the temperature and conductivity sensors.

Inertia-balanced plumbing removes pump speed fluctuations induced by accelerations of the CTD package. The duct improves salinity by channeling the same water past both sensors, and precisely controlling the dynamic response and time lag between measurements of both sensors.

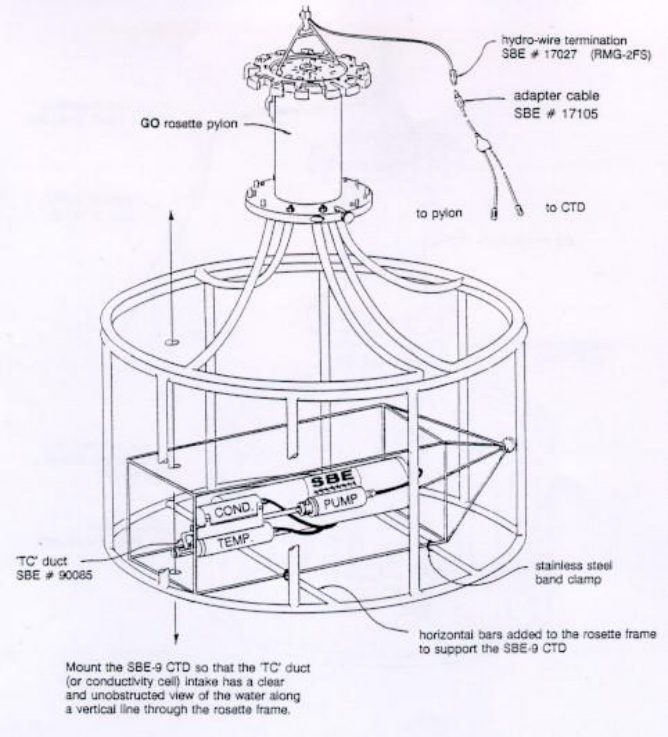

Figure 2

Horizontal mounting of the SBE 9 CTD in a General Oceanics Rosette frame

The CTD is left in the SBE guard cage and the guard cage is clamped to horizontal bars at the bottom of the Rosette frame. The pump is mounted in a straight line behind the conductivity cell with the base of the pump exhaust port oriented straight up (so that all trapped air in the pump chamber can escape). In this figure, a TC Duct has been installed on the sensing end of the temperature and conductivity sensors; consequently, the filter and orifice assembly between the conductivity cell and pump have been removed.

One advantage of the horizontal mounting is the ability to collect CTD data on both the down and up profiles. To obtain the best data, mount the CTD so that the TC Duct (or conductivity cell) intake is as close to the edge of the frame as possible, while maintaining an unobstructed view on a vertical line through the intake (so that the frame or Rosette bottles do not disturb the water that the CTD samples).

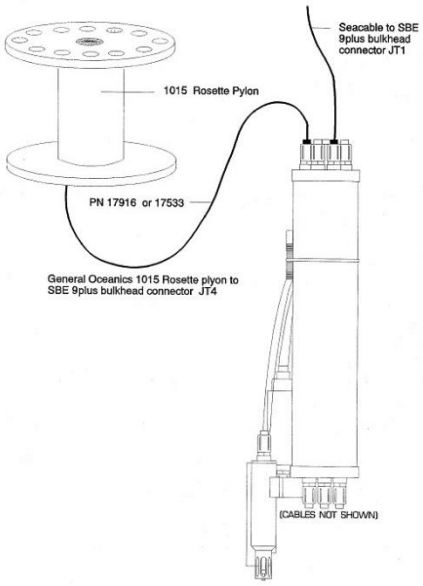

Figure 3