## APPLICATION NOTE NO. 48                                   June 2006

### Entering Calibration Coefficients for the Seapoint Turbidity Meter

The Seapoint Turbidity Meter measures turbidity by detecting scattered light from suspended particles in the water using dual 880 nm light sources and dual silicon photodiode detectors with visible light blocking filters. The design of the optical sensors confines the sensing volume to within 5 centimeters of the sensor windows.

Sensitivity of the Seapoint Turbidity Meter is determined by two control lines that allow the user to change the range and resolution as required for a particular application. Jumper cables may be purchased from Sea-Bird to allow the sensor range to be changed by inserting the jumper cable in line with the original purchased cable.

| Gain | Sensitivity (mV/FTU) | Range (FTU) |
|------|---------------------|-------------|
| 100X | 200 | 25 |
| 20X | 40 | 125 |
| 5X | 10 | 500 |
| 1X | 2 | <750 |

Select OBS/Nephelometers – OBS, Seapoint Turbidity as a voltage sensor when setting up the configuration (.con) file in Sea-Bird software. The software prompts for the gain and scale factor, and calculates:

$$\text{OUTPUT (FTU)} = \frac{500 * \text{Scale Factor} * \text{Voltage}}{\text{Gain}}$$

*where*
- Gain is as described above.
- Scale Factor can be used to adjust the calibration. When greater accuracy is desired, calibrate the sensor prior to deployment using a sample from the measurement site. When the sensor is calibrated using a suspended particle sample, enter the *Scale Factor* to correct any discrepancies in the equation. Factors such as fouling or scratches reduce the sensitivity of the sensor. Consult the Seapoint operating manual for maintenance and calibration procedures.

**Note:** The CTD configuration (.con) file is edited using the Configure menu (in SEASAVE or SBE Data Processing in our SEASOFT-Win32 suite of programs) or the Configure Inputs menu in SEASAVE V7.

Response to turbidity levels greater than 750 FTU is non-linear. The linear values calculated by our software will be incorrect for water samples with turbidity levels greater than 750 FTU. An approximate response can be calculated using the second-order polynomial equation:

$$\text{Voltage} = 2.2 \times 10^{-3} \, (\text{FTU}) - 3.0 \times 10^{-7} \, (\text{FTU}^2)$$