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APPLICATION NOTE NO. 48

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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

In our SEASOFT V2 suite of programs, edit the CTD configuration (.con or .xmlcon) file using the Configure Inputs menu in Seasave V7 (real-time data acquisition software) or the Configure menu in SBE Data Processing (data processing software). Select *OBS/Nephelometers/Turbidity – Turbidity Meter, Seapoint* as a voltage sensor when editing the configuration file; the software prompts for the gain and scale factor. SEASOFT calculates turbidity as:

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

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.

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:

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

Application Note Revision History

Date	Description
March 1996	Initial release.
September 2001	Incorporate Sea-Bird Windows software.
June 2006	Provide more details on using software.
May 2007	Incorporate Seasave V7.
February 2010	<ul style="list-style-type: none">• Change range from < 750 to 750.• Update Seasoft-Win32 to Seasoft V2.• Add information on .xmlcon configuration file.• Update Sea-Bird address.
August 2010	SBE Data Processing and Seasave 7.20g software revision: <i>OBS/Nephelometer</i> sensor listing in software changed to <i>OBS/Nephelometer/Turbidity</i>