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SEA-BIRD
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ECO Chlorophyll Fluorometer Characterization Sheet

Date: 9/13/2023

S/N: FLBBCDSLC-5583

Chlorophyll concentration expressed in $\mu\text{g/l}$ can be derived using the equation:

$$\text{CHL } (\mu\text{g/l}) = \text{Scale Factor} * (\text{Output} - \text{Dark counts})$$

Dark counts

Scale Factor (SF)

Maximum Output

Resolution

Digital

43 counts

0.0072 $\mu\text{g/l/count}$

4130 counts

1.0 counts

Ambient temperature during characterization

21.0 °C

Dark Counts: Signal output of the meter in clean water with black tape over detector.

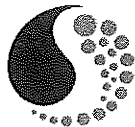
SF: Determined using the following equation: $\text{SF} = x + (\text{output} - \text{dark counts})$, where x is the concentration of the solution used during instrument characterization. SF is used to derive instrument output concentration from the raw signal output of the fluorometer.

Maximum Output: Maximum signal output the fluorometer is capable of.

Resolution: Standard deviation of 1 minute of collected data.

The relationship between fluorescence and chlorophyll-a concentrations in-situ is highly variable. The scale factor listed on this document was determined using a mono-culture of phytoplankton (*Thalassiosira weissflogii*). The population was assumed to be reasonably healthy and the concentration was determined by using the absorption method. To accurately determine chlorophyll concentration using a fluorometer, you must perform secondary measurements on the populations of interest. This is typically done using extraction-based measurement techniques on discrete samples. For additional information on determining chlorophyll concentration see "Standard Methods for the Examination of Water and Wastewater" part 10200 H, published jointly by the American Public Health Association, American Water Works Association, and the Water Environment Federation.

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ECO CDOM Fluorometer Characterization Sheet

Date: 9/13/2023

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CDOM concentration expressed in ppb can be derived using the equation:

$$\text{CDOM (ppb)} = \text{Scale Factor} * (\text{Output} - \text{Dark Counts})$$

Dark Counts

Scale Factor (SF)

Maximum Output

Resolution

Ambient temperature during characterization

Digital

51 counts

0.0908 ppb/count

4130 counts

1.0 counts

21.0 °C

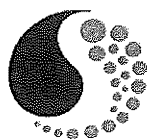
Dark Counts: Signal output of the meter in clean water with black tape over detector.

SF: Determined using the following equation: $SF = x \div (\text{output} - \text{dark counts})$, where x is the concentration of the solution used during instrument characterization. SF is used to derive instrument output concentration from the raw signal output of the fluorometer.

Maximum Output: Maximum signal output the fluorometer is capable of.

Resolution: Standard deviation of 1 minute of collected data.

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Scattering Meter Calibration Sheet

9/13/2023

Wavelength: 700

S/N FLBBCDSLC-5583

Use the following equation to obtain "scaled" output values:

$$\beta(\theta_c) \text{ m}^{-1} \text{ sr}^{-1} = \text{Scale Factor} \times (\text{Output} - \text{Dark Counts})$$

• Scale Factor for 700 nm = 1.813E-06 ($\text{m}^{-1}\text{sr}^{-1}$)/counts

• Output = meter reading counts

• Dark Counts = 44 counts

Instrument Resolution = 1.1 counts 1.99E-06 ($\text{m}^{-1}\text{sr}^{-1}$)

Definitions:

- **Scale Factor:** Calibration scale factor, $\beta(\theta_c)/\text{counts}$. Refer to User's Guide for derivation.
- **Output:** Measured signal output of the scattering meter.
- **Dark Counts:** Signal obtained by covering detector with black tape and submersing sensor in water.

Instrument Resolution: Standard deviation of 1 minute of collected data.