PO Box 518
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Scattering Meter Calibration Sheet

5/16/2019
Wavelength: 700 S/N FLBBCDSLC-5704

Use the following equation to obtain either digital or analog "scaled" output values:

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

• **Scale Factor for 700 nm**	=	1.832E-06	$(m^{-1}sr^{-1})$/counts
• **Output**	=	meter output	counts
• **Dark Counts**	=	44	counts
Instrument Resolution	=	1.0	counts

Definitions:

- **Scale Factor**: Calibration scale factor, $\beta(\theta_c)$/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.

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ECO CDOM Fluorometer Characterization Sheet

Date: 5/16/2019 S/N: FLBBCDSLC-5704

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

CDOM (ppb) = Scale Factor * (Output - Dark Counts)

	Digital	
Dark Counts	49	counts
Scale Factor (SF)	0.0908	ppb/count
Maximum Output	4130	counts
Resolution	1.0	counts
Ambient temperature during characterization	22.5	°C

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

SF: Determined using the following equation: SF = *x* ÷ (output - 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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SLC Testing Certification

Date 5/20/2019 S/N# FLBBCDSLC-5704

Low temperature test #1

Chill 2.5 hr at -20 °C

High temperature test #1 Verify operation post-testing

Heat 2.5 hr at 50 °C

Low temperature test #2 same protocol as #1

High temperature test #2 same protocol as #1

Vacuum test

< 0.1" Hg change in 10 min.

Pressure test

5 cycles, 0–1250 m with 10-sec. soaks
Held at 1250 m for 2 hrs. on last cycle

Electrical isolation

Resistance between copper faceplate and grounding wire is > 1 mΩ

Calibration verification

Verify calibration and dark counts in bb, chl, and CDOM channels

Verify 5% of single point check for chl and bb

Verify 10% of single point check for CDOM

Signature Ann Gaidos-Morgan

NOTES:

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ECO Chlorophyll Fluorometer Characterization Sheet

Date: 5/16/2019 S/N: FLBBCDSLC-5704

Chlorophyll concentration expressed in µg/l can be derived using the equation:

CHL (µg/l) = Scale Factor * (Output - Dark counts)

	Digital	
Dark counts	46	counts
Scale Factor (SF)	0.0072	µg/l/count
Maximum Output	4130	counts
Resolution	1.0	counts
Ambient temperature during characterization	22.5	°C

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

SF: Determined using the following equation: SF = x ÷ (output - 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.