WET Labs

Instrument Checklist

Date: 09/30/2014 **S/N:** BBFL2VMT-400 **Order #** 024662

Contents:

Description	Qty	Packed
■ ECO Meter	1	X
■ Calibration/Characterization Sheet	1	X
■ Repair/Modification Sheet	1	X
■ Dummy Plug		
■ Lock Collar		
■ Anti-Static Shipping Bag	1	X
■ Hard Plastic Protective End Cap	1	X
■ Pigtail with Lock Collar		
■ Spare Parts Card		
■ Dummy Plug Switch		
■ Compact Disc	1	X
■ Test Cable		
■ ECO to SBE Patch Cable		
■ White Saddle		

Checked by: JWV

Comments: _____

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WET Labs

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Date: 9/26/14 **Customer: U of Hawaii/Sarah Searson**

S/N# BBFL2VMT-400 **Technician: dcm**

Repairs and Modifications: Evaluated instrument and found it to be functional and responsive. We observed slight crack in FL channel schott glass filter. This was noted in 2013, and has not affected operation, will continue to monitor.
Also noted that the blue CHL LED is remaining "on" while in standby mode, indicating some failure in the LED drive circuit. This is not the normal mode of operation for the ECO puck on the Seaglider, so the issue would be transparent in the application.
We communicated with the customer our opinion on the low risk associated with continuing to operate the instrument. Completed standard puck service at customer request, factory tested and characterized the instrument.

Comments: New char sheets included.

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ECO Chlorophyll Fluorometer Characterization Sheet

Date: 9/25/2014

S/N: BBFL2VMT-400

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

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

	Digital
Dark counts	53 counts
Scale Factor (SF)	0.0104 µg/l/count
Maximum Output	4120 counts
Resolution	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: 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.

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ECO CDOM Fluorometer Characterization Sheet

Date: 9/25/2014

S/N: BBFL2VMT-400

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

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

	Digital
Dark Counts	51 counts
Scale Factor (SF)	0.1246 ppb/count
Maximum Output	4120 counts
Resolution	1.3 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: 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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Scattering Meter Calibration Sheet

9/25/2014
Wavelength: 660 S/N BBFL2VMT-400

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

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

• **Scale Factor for 660 nm**	=	3.760E-06	$(m^{-1}sr^{-1})$/counts	
• **Output**	=	meter reading	counts	
• **Dark Counts**	=	56	counts	
Instrument Resolution	=	1.3	counts	4.99E-06 $(m^{-1}sr^{-1})$

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.