



ECO Chlorophyll Fluorometer Characterization Sheet

Date: 12/18/2015

S/N: FLRTD-3090

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

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

	Analog Range 1	Analog Range 2	Analog Range 4 (default)	Digital
Dark Counts	0.057	0.027	0.013 V	47 counts
Scale Factor (SF)	6	12	24 $\mu\text{g/l/V}$	0.0074 $\mu\text{g/l/count}$
Maximum Output	4.96	4.96	4.96 V	16380 counts
Resolution	0.4	0.4	0.4 mV	1.0 counts
Ambient temperature during characterization				22.3 °C

Analog Range: 1 (most sensitive, 0–4,000 counts), 2 (midrange, 0–8,000 counts), 4 (entire range, 0–16,000 counts).

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

SF: Determined using the following equation: $\text{SF} = x \div (\text{output} - \text{dark counts})$, 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.

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.

PO Box 518
620 Applegate St.
Philomath, OR 97370

WET  **Labs**
ECO Calibration and Repairs

(541) 929-5650
Fax (541) 929-5277
www.wetlabs.com

Date 12/18/2015 Customer University of Alaska

S/N# FLRTD-3090 Technician SML

Diagnosis

Evaluated instrument and found no problems.

Repairs

Standard Service performed. Verified tuning, tested, and characterized instrument. Replaced case seals.

The bulkhead connector, pressure housing and window on the instrument are first inspected for possible damage.
The instrument then is powered on and the current data is checked to determine if the instrument is working properly.
The instrument pre-service characterization is performed
The head is next inspected for cracks in the LED, the detector and the motor bores.
The digital and analog operations are checked.
The instruments scaling is checked with dye or scatter proxy as determined by the instrument type.
The firmware version on the instrument is updated as necessary.
The case seals, desiccant, shaft seal, faceplate, and shaft are replaced as the instrument is reassembled.
The instrument is rescaled if needed after reassembly.
Standard testing is performed on the instrument and characterized before being returned to the customer.

ECO Standard Testing Definition

- Performed noise test: 1 sample/sec for 60 sec
- Performed stability test: 1 sample/sec for 12 hrs as needed
- Performed thermistor calibration if installed
- Performed live 6hr pressure test: 5 samples every 4 minutes as needed
- Pressure-tested unit
- Completed instrument characterization
- Updated unit's characterization sheet and included on CD
- Updated unit's device file and included on CD