



APPLICATION NOTE NO. 9

Revised September 2008

**Calculating SEASOFT Coefficients for
 Sea Tech Fluorometer and WET Labs Flash Lamp Fluorometer (FLF)**

Some Sea-Bird CTDs can be equipped with a Sea Tech or WET Labs Flash Lamp Fluorometer. For these fluorometers, the CTD configuration file requires the *scale factor* and *offset* to enable the software to calculate the concentration:

$$\text{Concentration} = (\text{voltage} * \text{scale factor} / 5) + \text{offset}$$

These fluorometers have internal, switch-selectable ranges. The *scale factor* is dependent on the fluorometer range:

| Fluorometer | Range (milligrams/cubic meter) | Scale Factor |
|--------------|--------------------------------|--------------|
| Sea Tech | 0 - 3 | 3 |
| | 0 - 10 (factory-set default) | 10 |
| | 0 - 30 | 30 |
| | 0 - 100 | 100 |
| | 0 - 300 | 300 |
| | 0 - 1000 | 1000 |
| WET Labs FLF | 0 - 100 | 100 |
| | 0 - 300 (factory-set default) | 300 |
| | 0 - 1000 | 1000 |

The *offset* can be calculated by measuring the fluorometer voltage output when its light sensor is completely blocked from the strobe light by an opaque substance such as heavy black rubber:

$$\text{Offset} = (-\text{scale factor} * \text{output voltage}) / 5$$

Note: *Scale factor* and *offset* can be adjusted to fit a linear regression of fluorometer responses to known chlorophyll a concentrations.

Using SEASAVE V7 to Determine Offset

1. In SEASAVE V7, select Configure Inputs; the Configure Inputs dialog box appears. On the Instrument Configuration tab, click Open (open an existing .con file), Create (create a new .confile), or Modify (modify an existing .con file). Input / verify the scale factor for the fluorometer from the table above.
2. In the Display menu, select Add New Fixed Display Window. In the Fixed Display dialog box:
 - A. Double click on the voltage channel used by the fluorometer from the list of available voltage numbers (see CTD Configuration Sheet at beginning of CTD manual for voltage channel assignments as shipped from the factory).
 - B. Modify other fixed display setup parameters (such as seconds between updates, font size, etc.) as desired.
 - C. Click OK.
3. Connect the CTD to the desired COMM port on the computer (verify that it matches the COMM port selected on the Serial Ports tab in the Configure Inputs dialog box).
4. Block the fluorometer light path with a completely opaque substance.
5. Start logging data in the CTD:
 - **CTDs that start logging by command** (such as SBE 16) - Use a terminal program to send the command to start logging. Disconnect from the terminal program to free up the COMM port.
 - **CTDs that start logging with a magnetic switch** (such as SBE 19 and 25) – Move the switch to the On position.
 - SBE 9plus starts logging automatically when you start real-time data acquisition in SEASAVE V7 (Step 6A).
6. In SEASAVE V7's Real-Time Data menu, select Start. The Start Real-Time Data Acquisition dialog box appears.
 - A. Click Start to start real-time data acquisition.
 - B. Record the fluorometer voltage and use this value in the equation to calculate the *offset*.
 - C. In the Real-Time Data menu, select Stop.
7. Enter the calculated *offset* in the .con file (select Configure Inputs to access the .con file).