C3™ Submersible Fluorometer

Product Instructions:
C-Series Analog Adapter

Introduction

The C-Series Analog Adapter (P/N 2300-480) allows users to convert the standard digital output from the C3 to a 0 - 5 VDC analog signal. The Adapter can convert the signal from 1, 2, or 3 channels installed on a C3. The voltage output is proportional to the fluorescence intensity measured by the sensors. Modeled after the C3 Submersible Fluorometer's battery pack, the Analog Adapter is designed to connect directly to the C3. The C3 Battery Bracket (P/N 2300-603) is required to hold the Analog Adapter in place and secure it, preventing any break in communication or power. With the C-Series Analog Adapter users can integrate their C3 Submersible Fluorometers into any CTD or multi-parameter platform that will accept a 0 – 5 volt output signal.

Required Accessories

The following accessories are required for installation and operation of the Analog Adapter.

Battery Bracket (PN:2300-603) – Designed to hold the Analog Adapter in place and support it to avoid any break in communication or power ensuring continuous data output.

An Analog (Pigtail) Cable – We offer various lengths that are necessary for standard integrations.

- P/N: 2100-750 2 foot pigtail cable
- P/N: 2100-755 5 meter pigtail cable
- P/N: 2100-751 10 meter pigtail cable
- P/N: 2100-752 25 meter pigtail cable
- P/N: 2100-753 50 meter pigtail cable

C3 Submersible Fluorometer Setup

There are only a few steps required to set up the C3 Submersible Fluorometer for analog output. There are two methods that may be used for calibrating C3 channels/sensors. The first is a Raw Fluorescence Units Blanked method and the second is a Direct Concentration Calibration. Use the Raw Fluorescence Units Blanked (RFUB) calibration if you do not have a standard with known concentration or if you are unsure what numeric value to assign your standard.

Calibration for Raw Fluorescence Units Blanked (RFUB)

1) Connect the C3 Submersible Fluorometer to your computer or laptop using the interface cable.
2) Supply power to the instrument.
3) Begin C-Soft Software.
4) Set the clock to PC time on the Settings tab.
5) Click on the Current Data tab and click the Calibrate button for channel 1.
6) Obtain a blank solution.
7) Immerse the instrument in the blank solution and click the Set Blank button in Step 1; the software will automatically set the blank for all three ranges (x1, x10, and x100).
8) From the unit's pull down menu in Step 2, choose RFUB (Raw Fluorescence Units Blanked).
9) If working with Chlorophyll or Rhodamine, choose the appropriate temperature coefficient from Step 4 on the Channel Calibration screen.
10) Click Save Calibration in Step 5 on the Channel Calibration screen.

Channel 1 has now been calibrated to the following range:

0 – 50000 RFUB = 0 – 5 Volts

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Direct Concentration Calibration

To calibrate to a specific range, users need to calibrate using a standard with known concentration following the steps below:

1) Connect the C3 Submersible Fluorometer to your computer or laptop using the interface cable.
2) Supply power to the instrument.
3) Begin C-Soft Software.
4) Set the clock to PC time on the Settings tab.
5) Click on the Current Data tab and click the Calibrate button for channel 1.
6) Obtain a blank solution.
7) Immerse the instrument in the blank solution and click the Set Blank button in Step 1; the software will automatically set the blank for all three ranges (x1, x10, and x100).
8) Immerse the instrument in the standard solution of known concentration.
9) Type in a value that represents the standard solution on a scale from 0-50000 (For Example, if your solution's concentration is 50µg/L and this solution represents half of maximum concentration you'll be measuring, type in the value 25000).
10) If working with Chlorophyll or Rhodamine, choose the appropriate temperature coefficient from Step 4.
11) Click Save Calibration in Step 5.

Channel 1 has now been calibrated to the following range:

0 – 50000 = 0 – 5 Volts = 0 – 100 µg/L

NOTE: Repeat one of the above calibrations for all channels that will be used for Analog Output.

Once calibration is complete, click the Log Setup tab to set the logging start time & logging interval. Click enable datalog, wait for C-Soft to automatically shutdown, and disconnect power. As soon as power is re-supplied to the C3 via the C-Series Analog Adapter it will automatically begin data output after 90 seconds, or pre-configured start time, at the set interval.

Analog Output

The C-Series Analog Adapter converts digital data to voltage to help users integrate our *in situ* fluorometers with almost any CTD, third party system, or data logger that accepts a 0-5 volt signal. Below are two ways to interpret voltage output based on the C3's setup.

Reading the Voltage Output for RFUB Calibrated C3's

The voltage output from the C3 Submersible Fluorometer via the C-Series Analog Adapter needs to be blank-corrected. Users can standardize the voltage signal using a standard of known concentration to convert RFUB to direct concentrations.

Reading the Voltage Output for Specific Range Calibrated C3's

The voltage output from the C3 Submersible Fluorometer via the C-Series Analog Adapter needs to be blank-corrected. The voltage output reflects direct concentrations re-scaled to 0-5 volts.

$$\textit{Actual Concentration} = \frac{\textit{(blank subtracted voltage)}}{\textit{(5 volts)}} \textit{ x (concentration at 5 volts)}$$

Example, if your measured voltage for a given sample is 2.567 volts and the blank voltage is 0.067 volts, your blank subtracted voltage is 2.5 volts.

[(2.5 volts) / (5 volts)] = 0.5

If your range maximum equals 100 µg/L, then (0.5 * 100 µg/L) = 50 µg/L. Therefore, a sample that measures 2.567 volts = 50 µg/L.

Wiring Guide

The wiring guide below indicates the function of each pin for the Analog Adapter's 6-pin male end. To avoid damaging the Analog Adapter, please ensure the pins are only used for their intended purpose.

Pin	Wire Color	Function
1	Red	VBatt + (Positive)
2	Black	VBatt – (Negative)
3	White	Analog Out 1 (0-5 VDC)
4	Green	Analog Out 2 (0-5 VDC)
5	Blue	Analog Out 3 (0-5 VDC)
6	Brown	Analog GND

Analog Adapter's 6-pin male end