PhytoFlash Active Fluorometer

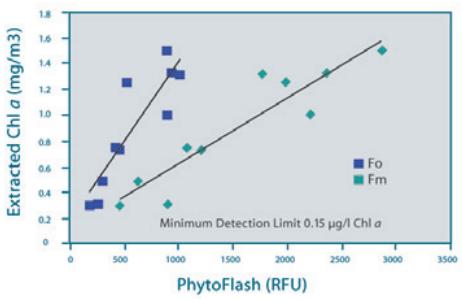
TURNER DESIGNS

PhytoFlash Submersible Active Fluorometer

PhytoFlash is an *in situ* Submersible Active Fluorometer that can be used to determine the quantum efficiency of phytoplankton in both oligotrophic and mesotrophic environments. PhytoFlash is distinct from other fluorescence instruments on the market in that it is the first solid-state instrument capable of variable fluorescence measurements on natural concentrations of phytoplankton. The solid-state platform allows for a much wider range of uses due to its small size, power efficiency, more stable components, and lower price point.

Features

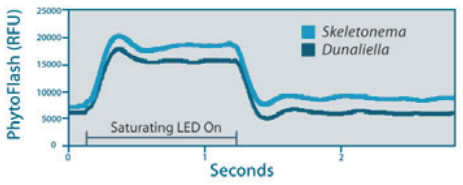
- Digitally integrates into a CTD or third-party system
- Low power consumption <1 W typical
- Extended battery life (Over 35 days at 30 second intervals)
- Large internal data logging memory (10,000 points)
- Optional solid secondary standard provides a quick, easy method to verify calibration
- Reports data in either Relative Fluorescence Units (RFU) or Direct Concentration



Accuracy & Sensitivity

Increased sensitivity for oligotrophic systems (Minimum Detection Limit 0.15 µg/l)

Accurate measurements of (Fo) and (Fm) fluorescence at low concentrations



Versatility

PhytoFlash can be operated in three different modes:

The Self-Contained Mode can be used with the internal data logging system and rechargeable battery pack.

The Integrated Mode allows PhytoFlash to be mated with and controlled by a third-party system.

The Laboratory Mode provides full reporting of the response curve.

Applications

- *In situ* measurement of phytoplankton photosynthetic parameters
- Indicator of nutrient status of planktonic algae
- Detection of the onset of algal blooms
- Oceanographic, estuarine, limnological and riverine studies
- Determination of non-photochemical quenching in laboratory mode
- Measurement of photosynthetic efficiency for all algae using Blue PhytoFlash

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Technique

The PhytoFlash detection system is best described as a short-pulse, multiple turnover variable fluorescence system. The technique utilizes 3 low-intensity LEDs to monitor minimum fluorescence (Fo) and, after saturating the cells in the sample chamber using 6 high-intensity LEDs, measure maximum fluorescence (Fm). The LEDs are arranged to provide an even distribution of light throughout the entire sample volume. The low intensity of the monitoring LEDs prevents an increase in the photosynthetic rate. Users are able to define the saturation duration (200 - 10,000 ms) of the high intensity LEDs. Under the Laboratory Mode users are able to view the response curve. A dark Flow Through Cap is available to allow for dark adaptation for all three modes.

Ordering Information

INSTRUMENT	PART NUMBER
Blue PhytoFlash Submersible Active Fluorometer (algae)	2500-000
Blue Titanium PhytoFlash Submersible Active Fluorometer (algae)	2500-000-T

Titanium withstands corrosion better than stainless steel and is recommended for stationary deployments in highly corrosive environments.

PHYTOFLASH ACCESSORIES	PART NUMBER
Submersible Battery Pack	2500-600
Flow Cap	2500-710
Shade Cap	2500-510
Solid Secondary Standard for Blue PhytoFlash	2500-900
0.6 Meter Pigtail Cable with Locking Sleeve	2500-170
10 Meter Pigtail Cable with Locking Sleeve	2500-171
25 Meter Pigtail Cable with Locking Sleeve	2500-172
Interface Cable and 12V Power Supply	2500-150
Dummy Plug	105-2570

Measured Parameters

Fo	Minimum fluorescence
Fm	Maximum fluorescence
Fv	Variable fluorescence (Fm - Fo)
Fv/Fm (yield)	Maximum quantum yield of photochemistry in PSII
Blank	Calculated blank value used in calibration
Response Curve	Available during laboratory mode

PhytoFlash Physical Specifications

Minimum Detection Limit	0.15 µg/L
Linear Range	0-100 µg/L
Weight in Air	3.25 lbs (1.47 kg)
Weight in Water	1.01 lbs (0.46 kg)
Length x Diameter	12" x 3" (30.5 cm x 7.6 cm)
Temperature	-2 to 50 degrees C
Depth	600 meters

PhytoFlash Electrical Specifications

Power Requirements	<1 W Typical
Supply Voltage Range	8 - 30 VDC
Detector	Photodiode
Light Source	Light Emitting Diode

Patents Issued 7301158 and 7470917