



FluoroProbe



## Submersible Spectrofluorometer with Automatic Algae Class and Chlorophyll Analysis

Gelbstoff measurement  
(CDOM) by irradiation with UV-LED



FluoroProbe –  
a highly sensitive measuring  
instrument

## Get to know your water ...

The bbe FluoroProbe is a highly sensitive measuring instrument for chlorophyll analysis. Due to the numerous features it can be used in a variety of applications. The submersible FluoroProbe quickly and reliably determines chlorophyll concentrations in real time. The measuring data of the probe can be displayed online or stored in the probe for subsequent analysis. The probe also detects the presence of algae and allocates them to various spectral algae classes (blue-green algae/cyanobacteria, green algae, diatoms/dinoflagellates/chrysophytae, cryptophytae). This enables the instrument to analyse the occurrence and distribution of algae on site without the necessity of the laboratory.



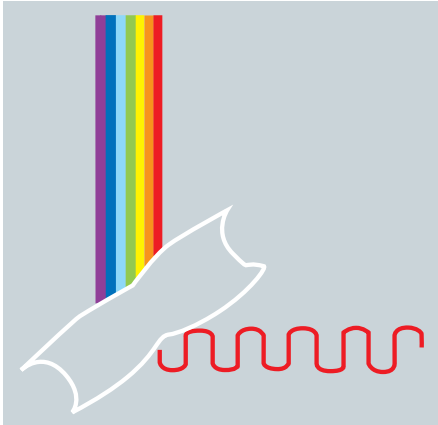
1000 m depth version

### Minimum set-up – maximum precision

- no sample preparation
- 'click and go'
- autostart with plug-in
- calculation in real time
- instant graphic plot function
- profile and/or time response display
- pre-adjustment of algae classes
- measurements according to HPLC-pigment analysis
- best fit for composite algae mixtures



## In situ chlorophyll profiling plus real-time algae class distinction



The fluorescence of algae due to excitation by visible light mainly depends on the presence of chlorophyll-a, a very common pigment in the plant world. The occurrence of other pigments is typical for different algae classes. Interactions between these different pigment systems with chlorophyll-a results in a special excitation spectrum for the taxonomical algae classes. The special patterns of this algae fluorescence – so-called fingerprints – are used in the bbe fluorometers for the quantification of different algae classes. The excitation light sources are LEDs with different wavelengths, mostly within the visible spectral range. The fingerprints of four algae classes and of Gelbstoff are already stored in the FluoroProbe. Special user-defined fingerprints can also be added and used to analyse the chlorophyll content of the water.



Handheld PC

### Gelbstoff measurement – CDOM

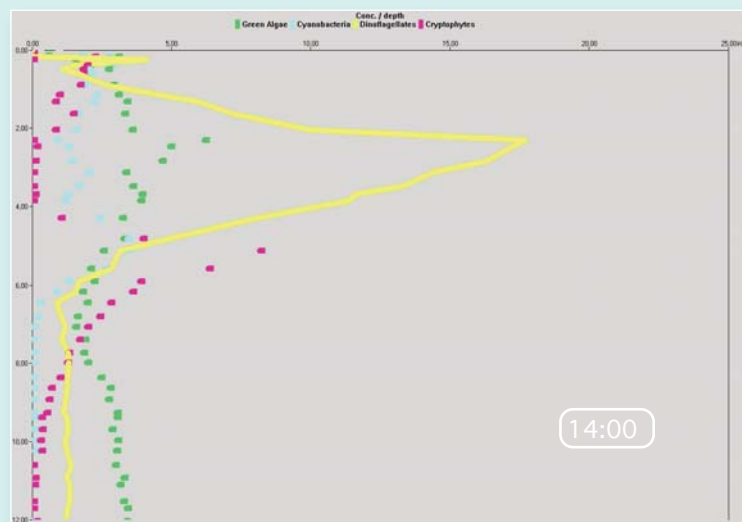
Decay of organic matter often results in products with fluorescent properties. Excitation with UV-light records Gelbstoff and allows blank readings/zero point correction for most cases with internally stored Gelbstoff fingerprints.

### The software of the FluoroProbe provides detailed data analysis

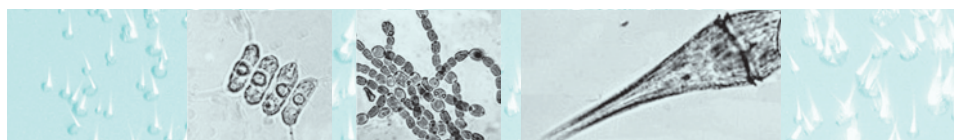
The results can be shown either as tables or graphs. Further processing allows zooming, printing and export of data. Also setting the parameters and calibrating the FluoroProbe is performed with the help of the PC bbe++ software. The screenshots show an example of distribution profiles recorded with the FluoroProbe in Lake Plussee (Northern Germany). The vertical migration of dinoflagellates was measured, both measurements were taken at the same location at 10:00 am (upper graph) and 14:00 noon (lower graph). Dinoflagellates were dominant.



Most of the dinoflagellates were situated at the surface (0-2 m) of the lake. A maximum of cryptophyta was found at circa 5 m.



The dinoflagellates had moved downwards in water layers with higher nutrient concentrations. Their maximum concentration was found at 3 m depth, whilst the other algal groups did not migrate. The concentration of cryptophyta remained stable at 5 m depth throughout the entire day.



## Applications

- drinking water monitoring for blue-green algae
- supervision of aquaculture systems
- control of bathing water for toxic algae blooms
- early warning system
- ocean research
- limnological research
- education



Versatile –  
FluoroProbe for lab use

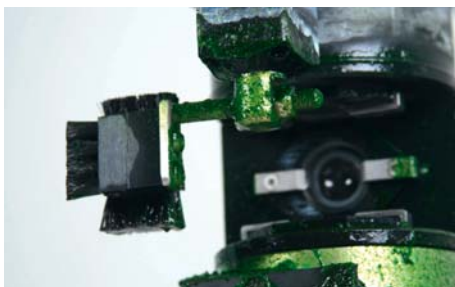
## Features

- determination of up to 5 different algae classes
- quantification of different algae classes within seconds by in situ measurement
- Gelbstoff measurement with UV-LED
- reduction of laborious microscopic observations – saving valuable time
- internal rechargeable battery for stand-alone measurements
- internal datalogger
- pressure sensor
- bbe++ software for data analysis included with PC
- optional water temperature sensor
- optional transmission sensor

## Specifications

### FluoroProbe

<b>Measurands</b>	total chlorophyll [ $\mu\text{g chl-a/l}$ ]
<b>Chlorophyll</b>	0 - 200 $\mu\text{g chl-a/l}$
<b>Measurement procedure</b>	spectral fluorometry
<b>Resolution</b>	0.01 $\mu\text{g chl-a/l}$
<b>Transmission</b>	0 - 100%
<b>Water temperature</b>	-2 - +40°C
<b>Housing material</b>	reinforced carbon fibre/V4A steel
<b>Weight</b>	4.5 kg
<b>Dimensions (H x D)</b>	450 x 140 mm
<b>Voltage</b>	12 V
<b>Battery capacity</b>	3900 mAh
<b>Operating time</b>	10 h @ 1 measurement per second 30 days maximum @ 1 measurement per day
<b>Memory capacity</b>	2.5 million datasets
<b>Interface</b>	RS485
<b>Maximum diving depth</b>	0 - 100 m 0 - 300 m (extended range 1) 0 - 1000 m (extended range 2)
<b>Options</b>	Workstation 25 (cuvette device) transmission measurement temperature measurement PDA with bbe software 2, 10, 20, 30, 50, 70, 100 m cables Flow-Through Unit Hydro-Wiper Protective Cage



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