PUCHEGGER UND GOTSCHY
ENGINEERING GMBH

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FIBER OPTIC
FLUOROMETER LLF-M (Multichannel)

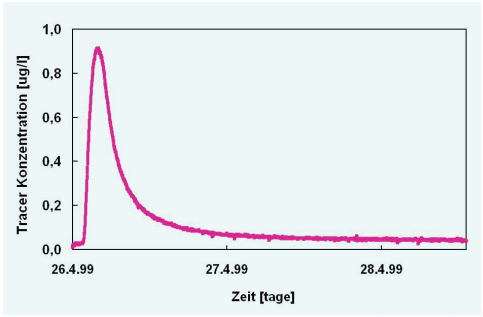
Portable multichannel fluorometer with integrated fiber optic probe for online- and in-situ-monitoring of dye tracer concentrations. This is an excellent device for monitoring water movement in a variety of situations such as:

- lakes, pools, tanks
- surface water courses (rivers, mountain streams)
- karst- and fissured aquifers (subterranean water courses, boreholes in solid rock)
- porous groundwater aquifers (wells and boreholes)

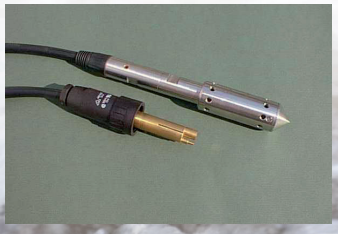
Development:

The development of the fluorometer was carried out at the University of Graz, Institute of Experimental Physics, Dept. Optics & Laser Technology in cooperation with Joanneum Research, Institute of Hydrogeology and Geothermics.

Operational Features:



A compact spectrometer module with a fiber optic probe, which is positioned directly into the groundwater, measures the local dye concentration by detecting the fluorescence intensity, with high temporal and spatial resolution. The LLF-M is usable for all dye tracers with visible fluorescence. The spectral adjustment required to test for various tracers is achieved through easily exchangable spectral filters. Simultaneous multichannel measurements are possible with the use of up to six spectrometer modules and fiber optic probes. Excellent tracer sensitivity is guaranteed by highly sensitive detectors. The device is controlled by a microcontroller and is fully-automatic. The measuring interval can be selected freely from 1 s up to 4 h. Qualitative and quantitative measurements can be done.



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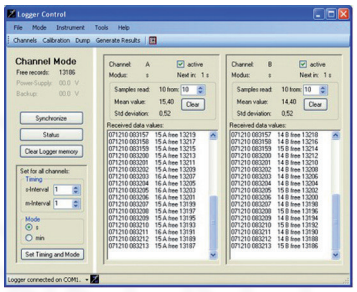
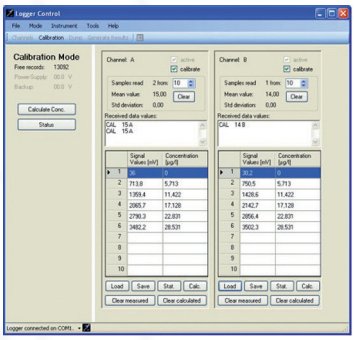
Software Loggercontrol:

By using the software LOGGERCONTROL the following parameters can be set: logger date, logger time, amount of active spectrometer modules, sampling interval, On/Off spectrometer modul. The software offers a calibration menu for calibration of each spectrometer module incl. fiber optical probe. The calibration data can be stored in the PC/notebook as ASCII-file. Data readout from the internal data logger to the PC by RS-232 interface with a USB to serial adapter. Simple data import into MS-Excel.



Housing types:

- Housing A: space for max. 2 spectrometer modules+ 2 fiber optical probes
- Housing B: space for max. 4 spectrometer modules + 4 fiber optical probes
- Housing C: space for max. 6 spectrometer modules + 6 fiber optical probes
- Length of fiber optical cable: standard 20 m, optional until 50 m possible
- Diameter sensor head: 25 mm



Advantages:

- continuous in-situ monitoring with high temporal and spatial resolution
- fully-automatic operation
- multichannel measurements allowing simultaneous monitoring at different locations
- simultaneous detection of different dye tracers
- no sampling of test substance, no disturbance of the examined water body
- no extensive sample transportation into the lab, no sample confusion

Technical Data

• Detectable tracers:	Uranine, Eosin, Sulforhodamine G, Rhodamine B, WT, WTS, Pyranine
• Detection sensitivity:	Uranine: ca. 10 ng/l, Eosin: ca. 35 ng/l, Sulforhodamine G: ca. 20 ng/l
• Number of signal channels:	1 – 6, depending on the housing type
• Measuring intervals:	1 second up to 4 hours, individual for each channel
• Data memory:	battery powered RAM, capacity for 14.000 data records
• Data display:	LC-Display and via RS 232 on PC/Notebook
• Probe diameter:	25 mm (max.)
• Probe length:	standardlength: 20 m, optional 50 m
• Data read out:	RS 232 interface
• Data format:	ASCII (date, time, measuring value)
• Power supply:	external, by 12 V Akku or 12 V DC-power supply
• Power consumption:	0,15 A (standby)
• Dimensions:	depending on the housing type, minimum: 32 x 34 x 29 cm (2-channel-device)
• Weight (without fiber probes):	depending on the number of channels, minimum: 6 kg (2-channel-device)

Technical modifications excepted