

UviLux

Compact *in situ* UV fluorometer

Highly sensitive UV fluorometer for real-time, in situ detection of aromatic hydrocarbons (PAH), CDOM, Tryptophan-like fluorescence (TLF), BOD or Optical Brighteners





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BACKGROUND

UviLux sensors enable real-time, in situ detection of a wide variety of UV fluorescence parameters, including: Polycyclic Aromatic Hydrocarbons (PAH), BTEX, CDOM, Tryptophan-like fluorescence (TLF), BOD and Optical Brightening Agents (OBA).

The compact and highly sensitive fluorometers have excellent turbidity rejection and high ambient light rejection, making them suitable for use in water and wastewater treatment works, as well as natural waters at the surface and to depths of up to 1000 m.

In addition to the high performance of individual sensors, deploying the sensors in pairs provides increased robustness to variable fluorescence backgrounds.

UviLux is easy to integrate into many instrumentation platforms and vehicles offering a wide range of data output options and input voltages. Monitoring stations and portable hand-held systems can be created by combining with the Hawk and Watchkeeper accessories.

Applications

- Pollution surveillance & investigative monitoring
- Point source pollution tracking
- Hydrocarbon monitoring in ports & coastal areas
- Road and airport apron run-off monitoring
- Pollution ingress into infrastructures
- Monitoring industrial effluent discharge in natural waters

Features

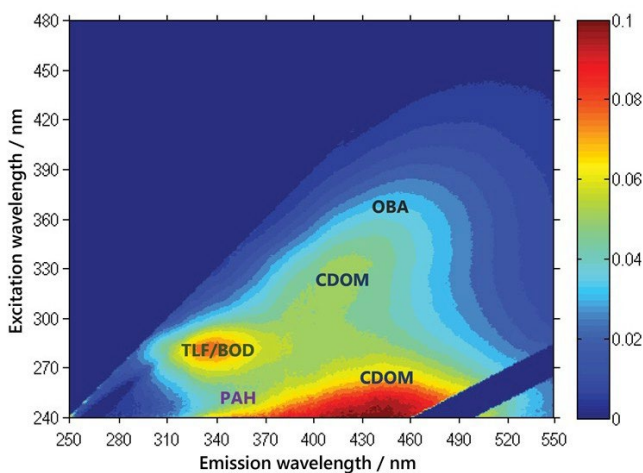
- Highly sensitive UV fluorometer
- Real-time data output of UV fluorescence parameters
- High ambient light rejection
- Excellent turbidity rejection
- Easy system integration with flexible data connectivity and wide voltage input range
- Low power consumption
- 1000 metre depth rating
- Flexible deployments with range of accessories
- Data validation provided



How it works

UviLux detects UV fluorescence. When certain dissolved aromatic compounds absorb UV light, they re-emit a fraction of this energy as fluorescence at longer wavelengths. Fluorescence intensity is directly proportional to concentration. The technique is widely recognised as one of the most sensitive detection methods available.

UviLux sensors use a stabilised UV LED light source and photomultiplier detector to provide exceptional measurement sensitivities. By exciting fluorescence at deep UV wavelengths, UviLux sensors can detect a wide range of UV fluorescence compounds at the parts-per-trillion level. Sophisticated electronic signal processing, combined with cowl design principles, enables UviLux to operate successfully in high levels of ambient light. The high quality optical filtration used in both the excitation and emission optical paths gives excellent turbidity rejection.



Fluorescence excitation-emission matrix of a natural freshwater sample, indicating PAH, TLF/BOD, CDOM and OBA.

UV fluorometer solutions from Chelsea

Chelsea Technologies designs and manufactures a range of fluorometers to monitor fluorescence from aromatic hydrocarbons (BTEX, PAH, CDOM) and organic pollutants (Tryptophan and Optical Brighteners).



Configurations

- **PAH fuel** for monitoring single ring aromatic eg BTEX
- **PAH** for monitoring polycyclic aromatic hydrocarbons such as carbazole and phenanthrene
- **Tryptophan** for bacteria monitoring and BOD assessment
- **CDOM** (255 nm or 280 nm ex) for measuring coloured dissolved organic matter in water systems
- **OBA** for monitoring optical brighteners

Accessories

- **Hawk hand-held display & logger for portable systems**
- **Watchkeeper wall-mounted display & logger for monitoring stations**
- **USB Interface for laboratory systems**
- **Flow-through systems**
- **Cuvette adapters**

Specifications

Parameter	PAH fuel	PAH	CDOM (crude)
Sensitivity (QSU)	0.06	0.03	0.03
Calibrated range (QSU)	600	600	600
Example compound: sensitivity range (ppb)	BTEX*: 3.0 – 50,000	Carbazole: 0.005 – 80 Phenanthrene 0.010 – 150	Perylene: 0.003 – 50

Parameter	Tryptophan	CDOM	OBA
Sensitivity (QSU)	0.01	0.01	0.08
Calibrated range (QSU)	600	600	1200
Example compound: sensitivity range (ppb)	Tryptophan: 0.02 – 1200 BOD: 0.001 – 50 mg/L	PTSA:*** 0.02 – 900	PTSA:*** 0.19 – 2,400

*BTEX is Benzene, Toluene, Ethylbenzene, p-Xylene, m-Xylene, o-Xylene at equal ppb concentrations

**NDSA is naphthalene disulphonic acid

***PTSA is pyrene tetrasulphonic acid

Interfaces	Digital	Analogue
Standard	RS232	0.5 – 5 Vdc
Option 1	RS232	4 – 20 mA
Option 2	SDI-12	Not available
Option 3	RS422	Not available

Input voltage		9 – 36 V
Depth rating		1000 m
Power requirement		< 1 Watt @ 12 V
Operating temperature		-2 °C to + 40 °C
Storage temperature		-40 °C to + 70 °C
Size		Ø 70 mm x 149 mm
Housing material		Acetal C
Weight		800 g in air / 150 g in water
Connector		Impulse MCBH6MP
Analogue modes		Linear or Logarithmic
Data validation		Data validation flags provided

The sensitivity and calibrated range of each UviLux sensor has been standardised by cross-correlating each calibration solution against a certified reference standard of quinine sulphate using a bench-top spectrofluorometer. Fluorescence is reported in Quinine Sulphate Units (QSU), where 1 QSU is equivalent to the fluorescence intensity recorded from 1 ppb quinine sulphate at an excitation wavelength of 347.5 nm and an emission wavelength of 450 nm. Factors are provided for selected compounds to convert the fluorescence output from QSU to ppb of the compound of interest.

*In view of our continual improvements, the designs and specifications of our products may vary from those described.



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