ESElog Fluorescence Detector

The simplest way to measure fluorescence

The ESElog Fluorescence Detector is an OEM business-to-business solution based on next-generation technology that enables fluorescence measurements at the point of need. The ESElog Fluorescence Detector is a high-performance fluorescence detector for measurement of up to 2 fluorescent dyes and is designed for use in a wide range of laboratory applications. Due to the lack of moving parts, low operating voltage, and confocal optics, the detector can be easily and rapidly integrated into various measurement processes. The ESElog is available as a standard product or can be customized.

Benefits of the ESElog Fluorescence Detector:

- Simple plug and play operation
- Flexible system; easily customized
- Fast realization of individual measurement needs
- Highly sensitive, contact-free measurements

ESElog Fluorescence Detector.

Short time to market

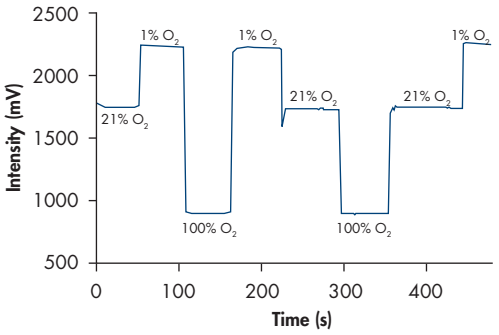
When developing a point-of-need detection system, you start your R&D work with a fully developed fluorescence detector. This means that you save costs, speed up your R&D work, and shorten the time-to-market.

After the initial development phase, you can switch from the ESElog to the Fluo Sens Integrated, and simply choose from a wide range of available filtersets, accessories, and customized adaptations to meet almost any measurement need.

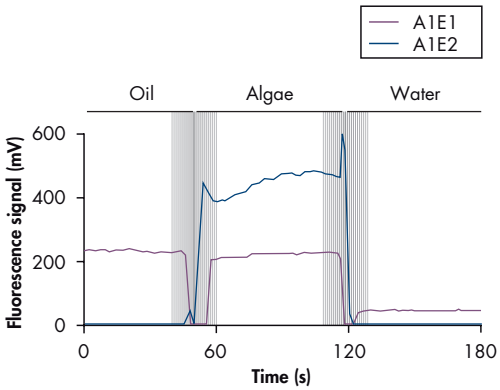
ESElog applications

The ESElog is a unique fluorescence detector designed for ease of use in a wide range of applications. Direct measurement of liquids or solids can be easily achieved by a small measurement window. The detector comes in a solid housing and can be easily mounted to standard optical benches, such as LINOS or ThorLabs.

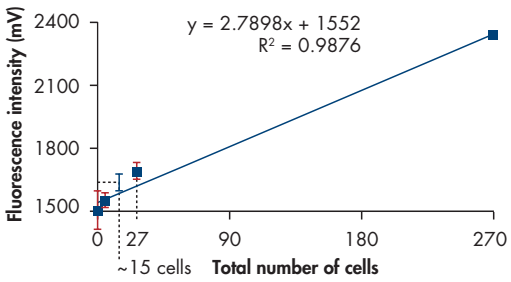
The ESElog can be connected to a PC via the integrated USB and is compatible with FL Digital Software for routine data evaluation, and labVIEW, for more detailed evaluation. ▶



Fast and reversible signal response. The oxygen sensor was exposed to different oxygen concentrations at different time points.



Effective differentiation of algal fluorescence from oils. The shaded regions represent sample changeover. The blue trace shows the signal optimized for algae (excitation 365 nm, emission 680 nm); the black trace shows the signal for excitation 365 nm, emission 460 nm.



Efficient detection of viable cells. Error bars are shown in red. The blue error bar represents the extrapolated data of detectable cells. The total volume was 300 µl and a total of 27 cells in 300 µl were measured. A total of 15 cells in 300 µl can be detected (extrapolated).

The ESElog is highly suited to a range of applications, including:

- Research and development
- Environmental testing
- Food testing
- Brand security

Application examples

Detecting oxygen levels in air

An oxygen sensor based on heavy metal chelates and a collisional quenching mechanism of fluorescence by oxygen was used to determine the oxygen content in air. The ESElog was used to excite the oxygen sensor and detect light emitted by it. The response of the signal is very fast (in the ms range) and is reversible.

Oil and algae in water

A small mobile, handheld system (ESElog plus cuvette holder) was used to check water quality and determine possible contamination in drinking water reservoirs. An oil-contaminated sample, an algal sample, and a water blank sample were measured, with the signal being recorded continuously.

The black trace shows strong responses for both lube oil and algae: the response to algae is undoubtedly due to NADPH fluorescence, which is used routinely as a marker for aquatic biomass. Clearly this measurement is open to interference from oils and other aromatic hydrocarbon products: The additional use of the second channel (sensitive to generic algal chlorophylls) effectively differentiates algal fluorescence from oils. The use of chlorophyll-specific wavelength sets may be used to differentiate different algal types.

Viable *E. coli* cell test

The resazurin system measures the toxic effects of unknown compounds by assessing the metabolic activity of living cells. Viable cells take up resazurin and reduce it internally to resorufin. This fluorescent compound and the redox reaction can be monitored. Only viable cells can reduce resazurin, therefore change in fluorescence intensity is due to viable cells.

A dilution series of *E. coli* K12 cells was prepared, resazurin (Sigma-Aldrich) was added, and the experiment carried out according to the manufacturer's instructions. Fluorescence was measured in a 1 cm quartz cuvette using the ESElog with cuvette holder (excitation 550 nm, emission 600 nm). A total of 27 cells in a total volume of 300 µl were detected. Extrapolation of the data to the ± 3x standard deviation show that the limit of detection is around 15 cells in 300 µl and this can be distinguished from the blank (resazurin containing buffer without cells).

ESElog Fluorescence Detector features

- Contact-free measurement on surfaces or in solutions
- Rapid, easy to control measurements
- Confocal optics
- Compatibility with optical systems
- Simultaneous measurement of 2 different wavelengths

Fluorescence measurements in cuvettes

2 different wavelengths can be detected in 1 sample. This can be used to monitor 2 different variables, for example, monitoring of water quality in lakes. A water sample in a cuvette can be tested for oil and algae contamination simultaneously. The detector is highly sensitive with a detection limit in the low pM range (fluorescein pH 12, 1 cm Quartz cuvette, room temperature).

Fluorescence measurements in tubes

Flourescence can also be measured in regular PCR tubes.

Surface measurements

The confocal measurement principle enables flexible positioning of the detector almost independently of distance and angle.

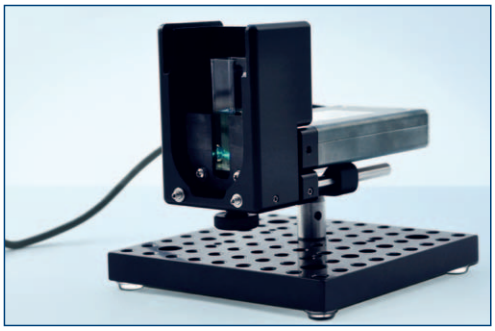
Mobile measurements

When combined with a PDA (personal digital assistant) or other small portable PC, the ESElog becomes a fully mobile and compact measurement unit, suitable for use in many situations.

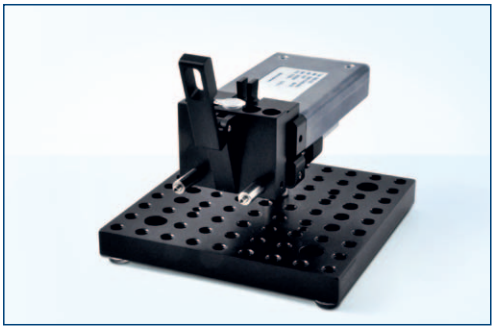
Accessories

The ESELog Fluorescence Detector is easily customizable for your applications with accessories including:

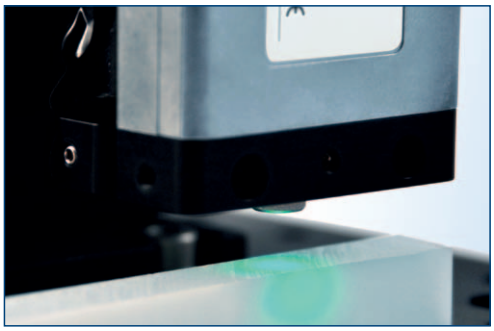
- Cuvette or tube holders compatible with optical systems
- PDA preloaded with evaluation software
- Ready-to-use measurement stations for liquids or solid surfaces
- Software for measurement (or alternatively labVIEW may be used)



ESElog Cuvette Holder.



ESElog Tube Holder.



ESElog detection on solid surfaces.

The ESElog in combination with a PDA.

Ordering Information

Product	Contents	Cat. no.
ESElog USB E365/D460 E520/D570	E1/D1: Alexa Fluor® 350; Pyrene; Terbium E2/D2: 5_TAMRA™; Alexa Fluor 532; ATTO 550; Cy®3 E1/D2: Qdot® 565, evidot® 580	9002063
ESElog USB E365/D460 E520/D625	E1/D1: Alexa Fluor 350; Pyrene; Terbium E2/D2: DY521XL; SYPRO® Red E1/D2: Chlorophyll-a(MeOH); Porphin/Porphyrene	9002064
ESElog USB E365/D460 E520/D680	E1/D1: Alexa Fluor 350; Pyrene; Terbium E1/D2: Chlorophyll-a(MeOH); Porphin/Porphyrene	9002065
ESElog USB E365/D520 E590/D625	E1/D1: ATTO 390; Cascade Yellow™; Dioxane; GFP; Riboflavin E2/D2: Alexa Flour 594; ATTO 590; Spectrum Red; Texas Red® E1/D2: Qdot 705	9002066
ESElog USB E365/D625 E660/D720	E1/D1: Europium; Toluene; OEP; tBu4-Azaporphine; Qdot 605 E2/D2: Alexa Flour 660; ATTO 680; Cy 5.5 E1/D2: Qdot 705	9002067
ESElog USB E470/D520 E550/D600	E1/D1: Cy2; FAM™; FITC; Fluorescein(EtOH); SYBR® Green; YFP E2/D2: BODIPY® 564/570; DY-548; Spectrum Orange E1/D2: RuBpy-NP; SYPRO Ruby	9002068
ESElog USB E470/D520 E565/D625	E1/D1: Cy2; FAM; FITC; Fluorescein(EtOH); SYBR Green; YFP E2/D2: Alexa Fluor 568; CY3.5; ROX™; Stains-All E1/D2: Acid Red 52; SYPRO Tangerine	9002069
ESElog USB E470/D520 E590/D640	E1/D1: Cy2; FAM™; FITC; Fluorescein(EtOH); SYBR Green; YFP E2/D2: Oxazine 170; Crystal violet (H2O)	9002070
ESElog USB E470/D520 E660/D720	E1/D1: Cy2; FAM; FITC; Fluorescein(EtOH); SYBR Green; YFP E2/D2: Oxazine 170; Crystal violet (H2O)	9002071
ESElog USB E470/D550 E590/D660	E1/D1: Acridine Red; Acridine Yellow; Alexa Fluor 430; Auramine E2/D2: Napthofluoresceine; Sensilight P3	9002072
ESElog USB E470/D570 E625/D680	E1/D1: Phosphine 3R; SensoPath Dye 10; SYPRO Orange E2/D2: Alexa Fluor 633; Cy5; LIZ®; Nile Blue; Spectrum Red	9002073
ESElog USB E470/D570 E625/D720	E1/D1: Phosphine 3R; SensoPath Dye 10; SYPRO Orange E2/D2: Mg-Phthalocyanine(PrOH, EX625)	9002074

Other combinations, interfaces (RS485), and accessories are available; please inquire.

For up-to-date licensing information and product-specific disclaimers, see the respective QIAGEN kit handbook or user manual. QIAGEN kit handbooks and user manuals are available at www.qiagen.com or can be requested from QIAGEN Technical Services or your local distributor.

Visit www.qiagen.com/fluorescence-detection and find out more!

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