

SeaOWL UV-A™

Sea Oil-in-Water Locator

Sea-Bird Scientific introduces SeaOWL UV-A™, a new in-situ oil-in-water sensor. Based upon the highly successful WET Labs ECO sensor, Sea-Bird Scientific has developed an industry leading oil detection technology with 5X optical resolution improvement over its predecessor.

SeaOWL UV-A™ measures crude oil-in-water using the same UV-A excitation and blue emission wavelengths (370 nm EX/ 460 nm EM) currently used in the ECO CDOM fluorometer. The SeaOWL UV-A™ improves the resolution and range of the ECO with a greater depth of field, optimized electronics and dynamic gain stage modulation. The new dynamic gain provides industry leading sensitivity across a large detection range making saturation unlikely in even the most heavily impacted environments. The compact SeaOWL UV-A™ design also includes chlorophyll fluorescence and 700 nm backscattering measurements to discriminate crude oil from phytoplankton and other natural sources of FDOM.



Features

- Industry leading optical resolution.
- Wide dynamic gain prevents measurement saturation even within heavily impacted environments.
- Three parameters in a single sensor: chlorophyll, backscattering, and Fluorescent Dissolved Organic Matter (FDOM).
- Backscattering and chlorophyll fluorescence provide discrimination of crude oil from phytoplankton and other natural sources of FDOM.

Optical

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|--|---|
| Backscattering wavelength | 700 nm |
| Backscattering sensitivity 700 nm ^A | 1E-06 m ⁻¹ sr ⁻¹ |
| Backscattering range 700 nm ^A | 0-0.04 m ⁻¹ sr ⁻¹ |
| Chlorophyll EX/EM | 470/690 nm |
| Chlorophyll sensitivity | 0.005 µg/l |
| Chlorophyll range | 0.005–250 µg/l |
| FDOM EX/EM | 370/460 nm |
| FDOM sensitivity | 0.03 ppb QSDE |
| FDOM range | 0.03–900 ppb QSDE |
| Oil Calibration | |
| Oil limit of detection ^B | < 80ppb crude oil |
| Oil sensitivity ^C | 3 ppb crude oil |

A) Backscattering specifications are derived from a vicarious calibration with a MCOMS backscattering sensor. Scale factors for backscattering incorporate the target weighting function and the solid angle subtended for the MCOMS optical backscattering sensor. The SeaOWL UV-A™ is highly linear in response to changes in the particle concentration of a specific particle population.

B) The estimated limit of detection (LOD) for the ECO CDOM fluorometer is <300 ppb crude oil (Conny et al., 2014), i.e. 30 counts. Using the same count to LOD relationship, LOD for SeaOWL UV-A was derived.

C) Applying the ECO CDOM fluorometer crude oil calibration from Conny et al., 2014, yields this scale factor.

Mechanical

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|---------------------------|-------------------|
| Diameter | 56.6 mm (2.23 in) |
| Length | 54.6 mm (2.15 in) |
| Weight in air (approx.) | 340 g |
| Displacement | 137 ml |
| Pressure housing material | Titanium 6Al-4V |

Electrical

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|---------------------------|--------------|
| Digital output resolution | 14 Bit |
| Communication | RS-232 |
| Sample rate | 1 Hz |
| Connector style | MCBH(WB)-6MP |
| Input voltage | 7–15 volts |
| Current, typical (@7V) | 81 mA |

Environmental

| | |
|---|--------------|
| Temperature range of calibration ^D | -2 to 38 °C |
| Storage temperature range | -20 to 50 °C |
| Depth rating | 2000 m |

D) The temperature range through which the instruments are tested for operation. The -2° C minimum covers all natural waters on Earth. Please contact Sea-Bird Scientific for testing to higher temperatures.