Sea-Bird Coastal ECO Sensors

Single and Multi-Channel Optical Sensors

The Sea-Bird Coastal line of ECO (Environmental Characterization Optics) sensors with technology by WET Labs provides highly accurate optical measurements in all aquatic environments. The ECO series includes single and multi-channel optical sensors that cover a wide range of monitoring and research requirements.

Equipped with high quality precision optics and proven Bio-wiper™ technology the ECO sensors can be deployed for extended periods of time without a reduction in data quality from biofouling. Longer maintenance intervals result in reduced operations costs and higher quality continuous data sets.

The ECO series provides flexibility for measurements in any environment. They can easily be equipped with internal logging and internal batteries, be integrated with another Sea-Bird Coastal Monitoring platform such as the WQM or be connected to most dataloggers. In different configurations they can be used for spot checking, profiling, and long-term unattended monitoring.

ECO Series Optical Sensors

Single Channel ECO

- Single channel configured to fit your specific needs
- Analog scaling to maximize resolution
- Capable of measurement using any one of the six ECO series optical sensors
- Optional integrated Bio-wiper™ , internal batteries and internal memory
- Used for attended or unattended monitoring

Dual Channel- FLNTU

- Dual channel configuration maximizes monitoring capability without increasing size
- Simultaneously monitor Chlorophyll A and turbidity in a variety of ranges
- Optional integrated Bio-wiper™ , internal batteries and internal memory
- Used for attended or unattended monitoring

Three Chanel- Triplet

- Three channels configured to fit your specific needs
- Capable of measurement using any three of the six ECO series optical sensc
- Optional integrated Bio-wiper™, internal batteries and internal memory
- Used for attended or unattended monitoring

Applications

For continuous or real time measurement of optical parameters in:

- Lakes and Reservoirs
- Rivers and Streams
- Coastal Estuaries

Ideal when monitoring or studying:

- Phytoplankton physiology and photosynthesis
- Primary productivity
- Submerged Aquatic Vegetation (SAV)

Performance Features and Benefits

- The use of a high quality filtered silicon photodiode provides a near equal spectral response across the entire wavelength range of the measurement (400- 700 nm)
- Active fouling control with optional fully integrated Bio-wiper™, ensuring accurate and stable long-term data sets, reducing the need for site visits

Additional Features

Optional internal batteries, logging, and scheduling.

Data Communications

ECO-PAR™ is complemented by SatView, a real-time interactive data logging and display application for use with Sea-Bird Coastal radiometers. SatView makes it easy to connect your instrument and view time series, spectral plots and depth profiles while capturing data for subsequent conversion and post processing.

View live ECO data on the LOBO monitoring platform at:
http://columbia.loboviz.com/

Sensor Overview

Chlorophyll-a

- Chlorophyll-a fluorescence is an indicator of active phytoplankton biomass and chlorophyll concentrations
- This can be used to track biological variability and abundance in the water column

Colored Dissolved Organic Matter (CDOM)

- Variation in CDOM are primarily due to natural processes but human activities such as logging, agriculture, wastewater discharge and wetlands drainage can affect levels in fresh water and estuarine systems.
- This can be used as a proxy for dissolved organic cardon (DOC), to research decreases in primary productivity and to explain other changes in the biogeochemical processes

Uranine (Fluorescein)

- Detection in parts per trillion allows for precise patch determination and first arrival time
- This can be used for dye tracing studies in surface and groundwater

Phycoerythrin & Phycocyanin

- Includes the high resolution necessary for early detection of blue green (phycocyanin) or brown (phycoerythrin) algae
- This can be used in the detection of harmful algal blooms (HABs)

Turbidity

- Unparalleled sensitivity in an optical scattering measurement at 700 nm
- Data is not affected by CDOM data because it is not using blue wavelengths
- Available in multiple ranges for maximized accuracy

Specifications

Electrical

Input	7 - 15 VDC
Current Draw, typical	50 mA; 60 mA (triplet)
Current Draw, standby	140 µA
Current draw, active wiper	140 mA; 200 mA (triplet)
Linearity	99%

Communications

Sample Rate	To 8 Hz (single/dual); to 4 Hz (triplet)
Data Storage, samples	108,000 (single); 90,000 (dual); 77,000 (triplet)
Communication Interfaces	Analog (single/dual only) & RS 232

Specifications

Mechanical

	Single/Dual Channel	Single/Dual Channel with Wiper	Single/Dual Channel with Batteries	Single/Dual Channel with Wiper and Batteries	Triplet	Triplet with Batteries	Triplet with Wiper	Triplet with Wiper and Batteries
Diameter	6.30 cvm						8.08 cm	
Length	12.70 cm	13.3 cm	28.00 cm		12. 7 cm	28 cm	22.1 cm	33.34 cm
Weight in Air, Water	0.40 kg, 0.02 kg	0.50 kg, 0.08 kg	0.96 kg, 0.14 kg		0.4 kg	.96 kg	1.28 kg	2.1 kg
Depth Rating	600 m	300 m				600 m	300 m	600 m
Temperature Range	0 – 30°C							

Single Channel ECO

Parameter	Wavelength EX/EM	Range	Sensitivity
Chlorophyll (Chl)	470/695 nm	0-125 µg/L	0.016 µg/L
Colored Dissolved Organic Matter (CDOM)	370/460 nm	0-500 ppb	0.09 ppb
Uranine (UR)	470/530 nm	0-400 ppb	0.05 ppb
Phycocyanin (PC)	630/680 nm	0-230 ppb	0.03 ppb
Phycoerythrin (PE)	540/570 nm	0-230 ppb	0.03 ppb

Dual Channel- FLNTU

Parameter	Wavelength EX/EM	Range	Sensitivity	Parameter	Wavelength EX/EM	Range	Sensitivity
Chlorophyll (Chl)	470/695 nm	0- 30 µg/L 0- 50 µg/L 0- 75 µg/L 0- 125 µg/L 0- 250 µg/L	0.015 µg/L 0.025 µg/L 0.037 µg/L 0.062 µg/L 0.123 µg/L	Turbidity (NTU)	700 nm	0- 10 NTU 0- 25 NTU 0- 200 NTU 0- 350 NTU 0- 1000 NTU	0.005 NTU 0.013 NTU 0.098 NTU 0.172 NTU 0.123 NTU

Three Channel- Triplet

Parameter	Wavelength EX/EM	Range	Sensitivity
Chlorophyll (Chl)	470/695 nm	0-30 µg/L 0- 50 µg/L	0.015 µg/L 0.025 µg/L
Colored Dissolved Organic Matter (CDOM)	370/460 nm	0- 375 ppb	0.18 ppb
Uranine (UR)	470/530 nm	0-300 ppb	0.07 ppb
Phycocyanin (PC)	630/680 nm	0- 175 ppb	0.09 ppb
Phycoerythrin (PE)	540/570 nm	0- 175 ppb	0.09 ppb