

The *Environmental Characterization Optics (ECO)* series of single channel fluorometers delivers both high resolution and wide ranges across our entire line of parameters using 14 bit digital processing. The *ECO* series excels in biological monitoring and dye trace studies. The potted optics block results in long term stability of the instrument and the optional anti-biofouling technology delivers truly long term field measurements.



- ***Ships with ECOView Host software***
- ***Optional integrated Bio-wiper™ and/or copper faceplate for anti-fouling***
- ***Optional integrated self-logging; 1 Mb memory***
- ***Full ocean depth model available***

Chlorophyll-a

Chlorophyll-a fluorescence is an indicator of active phytoplankton biomass and chlorophyll concentrations. This measurement is used for tracking biological variability and abundance in the water column.

Colored Dissolved Organic Matter

The CDOM *ECO* allows you to obtain CDOM fluorescence across a wide range of environments, from mangrove swamps to oligotrophic blue water.

Uranine (fluorescein) & Rhodamine

The ideal combination of linearity, sensitivity and range for dye studies. Detection limits in parts per trillion allows for precise patch determination and first arrival timing as well as reducing the necessary initial dye concentration.

Phycocerythrin & Phycocyanin

ECO phycobilin fluorometers have the high resolution necessary for early detection of either blue-green (phycocyanin) or brown (phycocerythrin) algae. These fluorometers are relative measurement instruments and should be calibrated by cell counts for a particular water mass.

Specifications

- **FL(RT)**—Provides analog or RS-232 serial output with 16,300-count (approximate) range. This unit provides continuous operation when powered.
- **FL(RT)D**—Provides the capabilities of the FL(RT) with 6,000-meter depth rating.
- **FL**—Provides the capabilities of the FL(RT) with periodic sampling.
- **FLS**—Provides the capabilities of the FL with an integrated anti-fouling *Bio-wiper*[™].
- **FLB**—Provides the capabilities of the FL with internal batteries for autonomous operation.
- **FLSB**—Provides the capabilities of the FLS with internal batteries for autonomous operation.

Mechanical

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| <i>Diameter</i> | 6.3 cm |
| <i>Length</i> | 12.7 cm |
| <i>Weight in air</i> | 0.4 kg |
| <i>Weight in water</i> | 0.02 kg |
| <i>Pressure housing</i> | Acetal copolymer |

Optical

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|------------------------|---------------------|
| Chlorophyll-a | ex/em: 470/695 nm |
| <i>Sensitivity</i> | 0.01 µg/l |
| <i>Range, typical</i> | 0.01 to 125 µg/l |
| CDOM | ex/em: 370/460 nm |
| <i>Sensitivity</i> | 0.09 ppb |
| <i>Range, typical</i> | 0.09 to 500 ppb |
| Uranine | ex/em: 470/530 nm |
| <i>Sensitivity</i> | 0.07 ppb |
| <i>Range, typical</i> | 0.12–230 ppb |
| Rhodamine | ex/em: 540/570 nm |
| <i>Sensitivity</i> | 0.01 ppb |
| <i>Range, typical</i> | 0.01–230 ppb |
| Phycocerythrin | ex/em: 540/570 nm |
| <i>Sensitivity</i> | 0.01 ppb |
| <i>Range, typical</i> | 0.01–230 ppb |
| Phycocyanin | ex/em: 630/680 |
| <i>Sensitivity</i> | 0.15 ppt |
| <i>Range, typical</i> | 0.15–400 ppt |
| <i>Linearity (all)</i> | 99 % R ² |

Electrical

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| <i>Digital output resolution</i> | 14 bit |
| <i>RS-232 output</i> | 19200 baud |
| <i>Analog output signal</i> | 0–5 V |
| <i>Internal data logging</i> | optional |
| <i>Internal batteries</i> | optional |
| <i>Connector</i> | MCBH6M |
| <i>Bio-wiper</i> [™] <i>cycle</i> | 140 mA |
| <i>Input</i> | 7–15 VDC |
| <i>Current, typical</i> | 80 mA |
| <i>Current, sleep</i> | 85 µA |
| <i>Data memory</i> | 90,000 samples |
| <i>Sample rate</i> | to 8 Hz |
| <i>Anti-fouling bio-wiper</i> [™] | optional |

Environmental

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|------------------------------------|---------------|
| <i>Temperature range</i> | 0–30 deg C |
| <i>Depth rating</i> | 600 m (std) |
| <i>Depth rating</i> | 6000 m (deep) |
| <i>Pressure/temperature sensor</i> | optional |

Specifications subject to change without notice.

ECO FL

Specification Sheet

Revision History

| Revision | Date | Revision Description | Originator |
|----------|----------|---|------------------------------------|
| A | 3/08/00 | Begin revision control | H. Van Zee |
| B | 10/26/00 | Correct spec info for DFLB (DCR 69) | H. Van Zee |
| C | 1/16/01 | Change AFLT to AFLD (DCR 80) | H. Van Zee |
| D | 5/21/01 | Correct input voltage minimum (DCR 109/110) | H. Van Zee |
| E | 1/23/02 | Remove "new" reference (DCR 190) | H. Van Zee |
| F | 3/13/02 | Correct DFSL/DFLB weights (DCR 201) | H. Van Zee |
| G | 4/16/02 | Add max. samples (DCR 215) | D. Whiteman |
| H | 5/1/02 | Change reference to AFLx (DCR 218) | H. Van Zee |
| I | 7/8/02 | Add battery option to spec table (DCR 228) | H. Van Zee |
| J | 10/15/02 | Update specification table (DCR 248) | H. Van Zee |
| K | 11/12/02 | Add analog capability (DCR 254) | I. Walsh |
| L | 2/24/03 | Replace "shutter" with "bio-wiper™" (DCR 280) | H. Van Zee |
| M | 3/26/03 | Correct reference from FLD to FL(RT)D (DCR 287) | A. Derr |
| N | 11/24/03 | Add other measurement parameters (DCR 340) | H. Van Zee |
| O | 5/11/04 | Add optical parameters (DCR 390) | I. Walsh |
| O1 | 6/16/04 | Update specifications | H. Van Zee, I. Walsh |
| P | 6/29/04 | Updates approved (DCR 400) | H. Van Zee, I. Walsh |
| Q | 8/26/04 | Add deep unit specs (DCR 419) | H. Van Zee |
| R | 9/20/04 | Correct CDOM sensitivity value (DCR 427) | I. Walsh |
| S | 2/7/05 | Correct phycoerythrin paragraph (DCR 449) | H. Van Zee |
| T | 9/26/06 | Update photo and specifications (DCR 507) | M. Johnson, H. Van Zee |
| U | 4/25/07 | Correct length of deep unit (DCR 515) | A. Gellatly |
| V | 9/9/08 | Add phycocyanin spec (DCR 614) | J. Rodriguez, H. Van Zee, I. Walsh |
| W | 1/21/09 | Correct uranine range (DCR 644) | H. Van Zee |
| -- | 2/12/09 | Update format | H. Van Zee |
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