

UBAT

Photosynthetically Active Radiation Sensor

Underwater Bioluminescence Assessment Tool (UBAT) is designed to measure mechanically stimulated bioluminescence in both coastal and oceanic systems from 0–600 m in depth.

Bioluminescence, in conjunction with other IOPs, can provide a more complete picture of spatial and temporal variability of the biogeochemical complexity of coastal and ocean ecosystems, especially the response of the planktonic community, to environmental fluctuations



Features

- Provides calibrated, high-resolution (60 Hz signal & 1 Hz average) measurement of
- mechanically stimulated bioluminescence for assessing water column ecosystem dynamics.
- Field calibration light source is used to track sensor



Optical

Detectors	Photomultiplier Tube
Detection Range	$1.50\text{e}^7 - 6.7\text{e}^{13}$ Photons s^{-1}

Electrical

Digital output signal	RS-232
Digital output resolution	16 bit
Baud rate	19200
Input voltage	9–18 VDC
Current, typical	600 mA
Sample rate	60 Hz sampling rate with 1 Hz data output rate
Connectors	MCBH-6-MP (power & communication), MCBH-3-FS (Validation LED)

Data

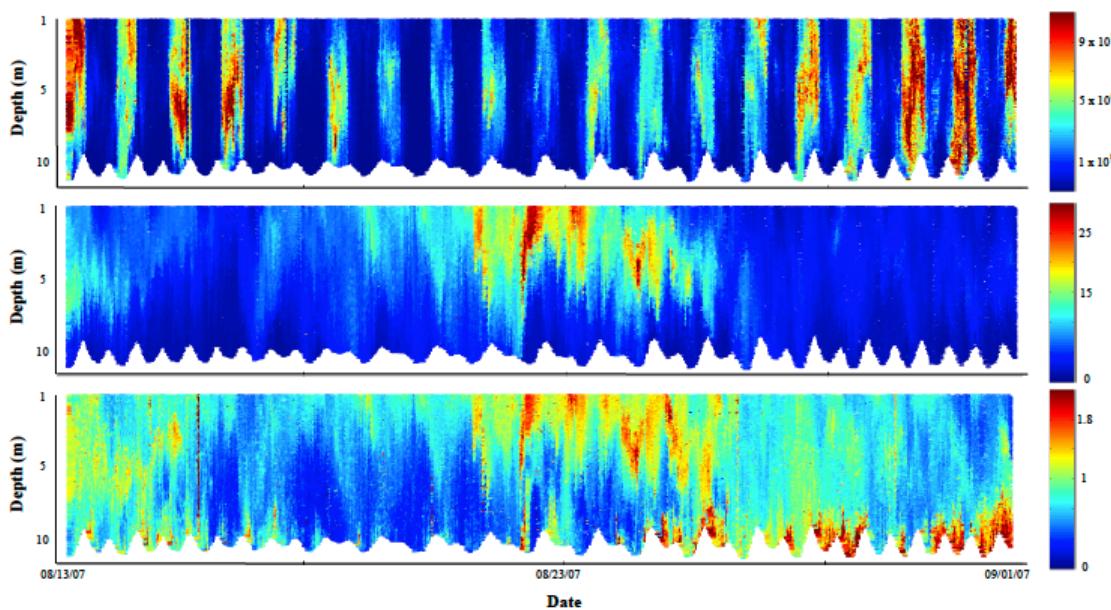
Units	Photons $\text{L}^{-1} \text{s}^{-1}$
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Mechanical

Dimensions	34.93 cm x 10.80 cm x 16.83 cm
Intake	3.81 cm ID; 5.08 cm OD
Weight in air	5.10 kg
Weight in water	1.64 kg
Pressure Housing	Acetal copolymer
Detection Chamber	Molded acrylic and titanium dioxide ($> 95\%$ reflectance between 430–700 nm) —Light-baffled air-bleed ports located at top of the detection chamber exhaust any air
Flow Rate	$0.330 \pm 0.03 \text{ L s}^{-1}$

Environmental

Temperature Range	4 - 48 °C
Depth Rating	600 m



Bioluminescence (photons $\text{L}^{-1} \text{s}^{-1}$), chlorophyll-a ($\mu\text{g L}^{-1}$), and turbidity (NTU) vertical time series collected with an autonomous profile mooring between August 13–31, 2007, at the California Polytechnic State University Center for Coastal Marine Sciences located in Avila Beach, CA.