

# HyperOCR

HYPERSPECTRAL OCEAN COLOR RADIOMETER



## Overview

The Hyperspectral Ocean Color Radiometer (HyperOCR) provides 136 channels of precision calibrated optical data from 350 to 800 nm. The HyperOCR can easily integrate into third-party equipment or connect directly to a computer for real-time measurements. Sea-Bird Scientific's proprietary RS-485 SatNet networking interface provides the capability to combine several Sea-Bird Scientific devices on a single telemetry interface for applications where serial inputs are limited on host data acquisition devices.

## Features

- 350-800 nm calibrated range
- Irradiance and radiance radiometers for in-water and in-air
- Fully characterized cosine response
- Integrated shutters for accurate dark correction
- Networking capability
- Fast sampling rate (up to 3 Hz)
- Compatible with Bioshutter II
- Data logging and processing software available

## Applications

- Bio-optical analysis of natural water bodies
- Aquatic photosynthesis studies
- Estimation of UV radiation levels
- Hyperspectral measurements for agriculture and forestry



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## Field Specifications

The specifications below represent the expected performance of the instrument when deployed in the field. Under controlled circumstances in a lab, we would expect the instrument to outperform these specifications.

We have chosen to display field specifications to give our users a true measure of how Sea-Bird Scientific instruments perform in harsh environments and applications. It is critical to keep this in mind when comparing specifications with instruments from other manufacturers.

Specifications				
Characteristics	Irradiance Air	Irradiance Water	Radiance Air	Radiance Water
SPATIAL Field of View	Cosine RMS Error 3% 0 - 60° 10% 60 - 85° (350-800 nm)	Cosine RMS Error 3% 0 - 60° 10% 60 - 85° (350-800 nm)	3° Half-angle Half-radiance	8° Half angle Half-radiance
ELECTRICAL				
Typical Noise Equivalent (Ir) Radiance*	$1.0 \times 10^{-3}$ ( $\mu\text{W cm}^{-2} \text{nm}^{-1}$ )	$1.5 \times 10^{-3}$ ( $\mu\text{W cm}^{-2} \text{nm}^{-1}$ )	$5.3 \times 10^{-5}$ ( $\mu\text{W cm}^{-2} \text{nm}^{-1} \text{sr}^{-1}$ )	$9.0 \times 10^{-5}$ ( $\mu\text{W cm}^{-2} \text{nm}^{-1} \text{sr}^{-1}$ )
Saturation*	9.0 ( $\mu\text{W cm}^{-2} \text{nm}^{-1}$ )	13.5 ( $\mu\text{W cm}^{-2} \text{nm}^{-1}$ )	0.5 ( $\mu\text{W cm}^{-2} \text{nm}^{-1} \text{sr}^{-1}$ )	0.8 ( $\mu\text{W cm}^{-2} \text{nm}^{-1} \text{sr}^{-1}$ )
PHYSICAL				
Height	39.9 cm	39.9 cm	36.2 cm	36.2 cm
Diameter	6.0 cm	6.0 cm	6.0 cm	6.0 cm
Weight	1.0 kg	1.0 kg	1.0 kg	1.0 kg
Depth Rating	300 m	300 m	300 m	300 m
Operating Temperature	-10 to +50 °C	-10 to +50 °C	-10 to +50 °C	-10 to +50 °C

\*At 500nm with 1024 ms integration time.

Optical Characteristics		Electrical Characteristics	
Spectrograph Range	305 - 1100 nm	Acquisition Module	16 bit ADC
Factory Calibration	350 - 800 nm	Integration Time	4 - 2048 ms (adaptive gain feature), 1 ms resolution
Spectral Sampling	3.3 nm/pixel	Frame Rate	3 Hz (at 128 ms integration time)
Spectral Accuracy	0.3 nm	Data Rate	9600 - 115200 bps (user selectable)
Spectral Resolution	10 nm	Telemetry Interface	RS-422 / RS-232 (isolated)
Stray Light	$<1 \times 10^{-3}$	Input Voltage	9-18 VDC
Detectors	256 channel silicon photodiode array	Network Interface	Proprietary RS-485 SatNet (isolated)
Entrance Slit	70 x 2500 $\mu\text{m}$		