

THREE-CHANNEL FLUORESCENCE AND BACKSCATTER SENSOR



LOW POWER,
HIGH SENSITIVITY

The RBRtridente is an optical sensor with three channels, capable of making multiple fluorescence and backscatter measurements simultaneously. Its high dynamic range permits exposure to full sunlight with very low detection limits, while power consumption and depth rating have been tailored for use in a wide variety of applications.

FEATURES



Low power consumption



High sensitivity



High dynamic range



Depths up to 6000m



RS-232 output



Compact and lightweight

The RBRtridente can integrate any three of the following channels:

▶ Chlorophyll a ▶ fDOM ▶ Phycocyanin ▶ Phycoerythrin ▶ Rhodamine ▶ Fluorescein ▶ Backscatter ▶ Turbidity

The size makes the RBRtridente compatible with existing vehicle payload bays. Tolerant of a wide-ranging power supply, data are streamed via RS-232 on the MCBH-6-MP connector. Synchronous detection and automatic gain control allow for full sunlight exposure while still permitting high-resolution measurements of very small signals.

A dry-bay OEM variant of the RBRtridente is available for vehicle integration applications.



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Specifications

Physical

Connector	MCBH-6-MP
Depth rating	6000m, 1250m (dry-bay)
Housing	Titanium
Diameter	63.3mm
Length	57mm, 93mm with connector 56mm with cap (dry-bay)
Weight	460g in air, 275g in water 250g in air, 50g in water (dry-bay)
Operating T° range	-5°C to +35°C
Sampling rate	Up to 32Hz

Optical

Centroid angle	120°
Sensing volume	~1.3mL
Linearity, R ²	0.99
Initial accuracy	5%

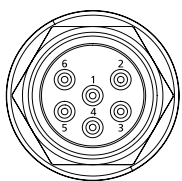
Power

Supply voltage	4.5V to 30V (12V nominal)
Power	20mJ/sample (4Hz or slower) 32mA (384mW) (8Hz or faster)
Sleep current	10µA

Interface

RS-232 polled or autonomous streaming

MCBH-6-MP connector pinout



- ▶ Pin 1 - Ground
- ▶ Pin 2 - Power
- ▶ Pin 3 - Serial data from sensor
- ▶ Pin 4 - Serial data to sensor
- ▶ Pin 5 - N/C
- ▶ Pin 6 - N/C

Parameters

	Channel wavelength(s)	Calibrated range	Measurement range	Detection limit
Chlorophyll a	470nm/695nm ⁽¹⁾ or 435nm/695nm ⁽¹⁾	0-50µg/L ⁽²⁾	0-500µg/L	0.010µg/L ⁽²⁾
fDOM ⁽³⁾	365nm/450nm ⁽¹⁾	0-500ppb	0-1500ppb	0.030ppb
Phycocyanin	590nm/654nm ⁽¹⁾	0-500µg/L	0-10000µg/L	0.200µg/L
Phycocerythrin	525nm/600nm ⁽¹⁾	0-6000µg/L	0-10000µg/L	2.0µg/L
Rhodamine	550nm/600nm ⁽¹⁾	0-1000µg/L	0-1000µg/L	0.015µg/L
Fluorescein	470nm/550nm ⁽¹⁾	0-500µg/L	0-1500µg/L	0.010µg/L
Backscatter	470nm, 525nm, 650nm, or 700nm	0-0.05m ⁻¹ sr ⁻¹ ⁽⁴⁾	0-1.5m ⁻¹ sr ⁻¹	1x10 ⁻⁶ m ⁻¹ sr ⁻¹
Turbidity	650nm or 700nm	0-500FTU ⁽⁴⁾	0-1500FTU	0.001FTU

¹ Excitation/emission.

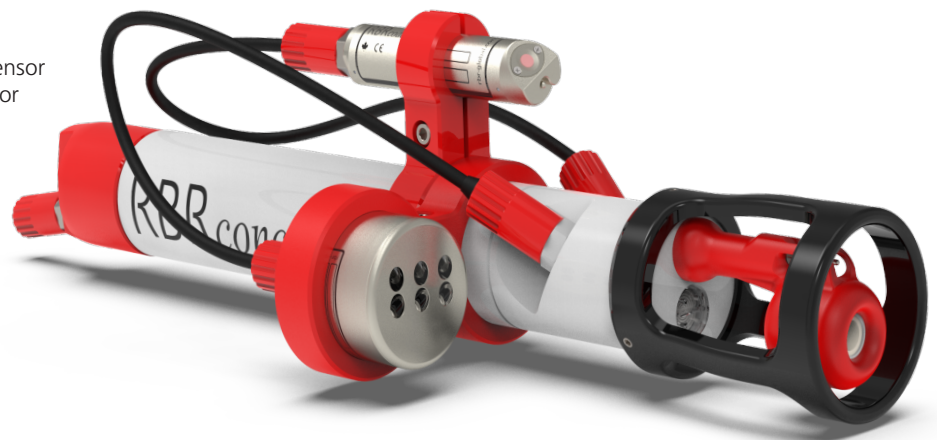
² Scaled for the in vivo fluorescence response.

³ fDOM can be used as a proxy for cDOM.

⁴ Response becomes non-linear above the calibrated range.

Instrument integration

The RBRtridente can be easily added to any RBR instrument alongside the CTD and other sensors.



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