

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 following channels are available in the RBRtridente:

- ▶ chlorophyll a
- ▶ fDOM
- ▶ backscatter
- ▶ turbidity

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

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Specifications

Physical

Connector	MCBH-6-MP
Depth rating ¹	Up to 6000m
Housing	Titanium
Diameter	63mm
Length	57mm, 93mm (with connector)
Weight	400g (in air), 210g (in water)
Temperature range	-5°C to +35°C
Sampling rate	Up to 32Hz

¹ Standard depth rating is 2000m. 6000m is available upon request. Contact RBR for more information.

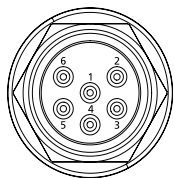
Power

Supply voltage	4.5V to 30V (12V nominal)
Power	20mJ/sample (4Hz or slower) 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

Optical

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

Chlorophyll a

Channel wavelength (excitation/emission)	470nm/695nm
Calibrated range ²	0-50µg/L
Detection limit ²	0.01µg/L

² Scaled to the fluorescence response from a monoculture of *Thalassiosira weissflogii*.

fDOM³

Channel wavelength (excitation/emission)	365nm/450nm
Calibrated range	0-500ppb
Detection limit	0.03ppb

³ fDOM can be used as a proxy for cDOM.

Backscatter

Channel wavelength	470/525/650/700nm
Calibrated range ⁴	0-0.05m ⁻¹ sr ⁻¹
Detection limit	1x10 ⁻⁶ m ⁻¹ sr ⁻¹

⁴ Response becomes non-linear above 0.05m⁻¹sr⁻¹.

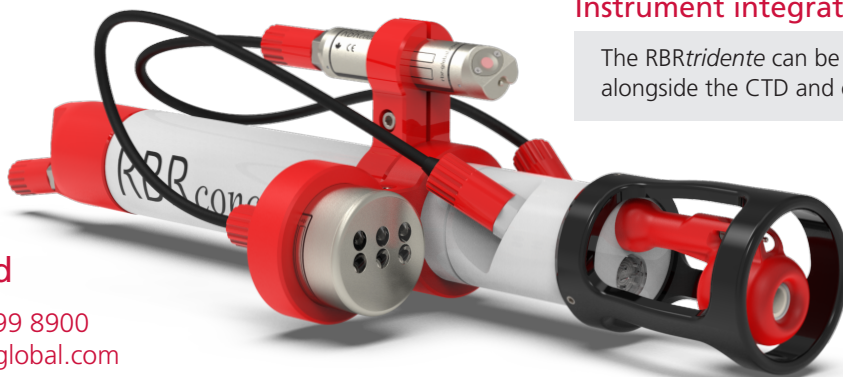
Turbidity

Channel wavelength	700nm
Calibrated range ⁵	0-500FTU
Detection limit	0.001FTU

⁵ Response becomes non-linear above 500FTU.

Instrument integration

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



RBR Ltd

+1 613 599 8900
info@rbr-global.com
rbr-global.com