



# Proteus BOD Portable Water Quality Meter

*An award-winning multi-parameter, real-time sensor platform (portable or permanent) that accurately and reliably measures BOD in open channels.*

The Proteus BOD is the world's first scientifically proven sensor for measuring BOD that compensates for temperature and turbidity. A multiprobe that measures your choice of parameter, all in one package, that can deliver data in the toughest field conditions. The Proteus has been designed for it's ease of use, reliable data and economical operation.

**Easy integration:** The Proteus can be effortlessly integrated with telemetry/SCADA systems and other datalogging devices with external RS232/Modbus/SDI12 or simply by using it's internal datalogger. The integrated datalogger can log 1,000,000 readings and it can be used with Tablets/Mobile Phones.

**Apply more sensors:** The patent-pending and award-winning Proteus BOD breaks the boundaries of water quality meters. The Proteus offers a unique platform to add additional sensors such as pH, REDOX, electrical conductivity, dissolved oxygen, turbidity and many others.



## Applications

The Proteus BOD can be used for a wide range of portable and permanent applications including:

- BOD Loading to Wastewater Treatment Works (WWTWs)
- Combined Sewage Overflow (CSO) event monitoring
- Point Source Pollution monitoring
- Faecal Coliform monitoring
- River pollution monitoring and surveillance
- Efficiencies of Wastewater Treatment Works
- Diffuse Pollution Monitoring
- Groundwater Water Quality Monitoring
- Survey tool combined with Bluetooth

**Measure bacteria/coliforms:** The Proteus is the first instrument globally that has the potential to measure bacteria/coliforms in drinking water in real time.

**Improved process control:** Let the Proteus BOD monitor multiple process parameters 24/7.

**Self cleaning:** As it is essential that optical sensors have a cleaning mechanism, the Proteus is also supplied with an integral wiper which cleans all of the Proteus' sensors before every measurement cycle.

**Virtually maintenance free:** The system is fully serviceable in the field and requires almost no maintenance. Logs data unattended minimizing manpower requirements and safety issues.

**Multiple power options:** Power can be provided by the internal lithium battery pack for unattended logging, or an external power source (battery, mains or solar).

## Parameters include:

- BOD
- Dissolved Oxygen
- Pressure
- Chloride
- pH
- Temperature
- Optical Brighteners
- Nitrate
- ORP / Redox
- Tryptophan
- Refined Oils
- Ammonium
- EC / Salinity / TDS
- Turbidity
- Crude Oils CDOM

Sensor Specifications					
Parameter		Range	Resolution	Accuracy	Comments
BOD	BOD mg/l	0-200mg/l	0.01 mg/l <sup>-1</sup>	< 5 % of reading*	Local site calibration can improve accuracy. * providing adequate field calibration
Coliform Counts	per 100ml <sup>-1</sup>	>1 count/100ml <sup>-1</sup>	1 count/100ml <sup>-1</sup>	1 count/100ml <sup>-1</sup>	
DOC (Dissolved Organic Carbon)	DOC mg/l	0 - 400 mg L <sup>-1</sup>	0.01 mg L <sup>-1</sup>	< 5 % of reading*	* providing adequate field calibration
Temperature	Water Temperature	-5 to 50 °C	0.01	0.1	never needs calibration
pH/ORP	pH	0 to 14 units	0.1	0.1 within 10 C of calibration, 0.2 otherwise	refillable reference electrode; corrected for temperature; typical sensor life > 4 years
	ORP	-999 to 999 mV	1	20 mV	platinum ORP sensor is combined with pH sensor
Turbidity	Turbidity	0 to 40 FNU	4 digits with maximum of two decimals	2% of reading or 0.2	compensated for temperature; filtered for non-turbidity spikes; includes wiper to clean the optics
		40-400 FNU		2% of reading or 0.2	
		400-5000 FNU		2% of range	
Transmissivity	0 to 100% transmission	4 digits	linearity of 0.99R <sup>2</sup>	WETLabs SeaStar; mounts alongside the Manta	
Optical Dissolved Oxygen	Concentration	0 to 20 mg/l	0.01	0.1	compensated for temperature and salinity; EPA approved "lifetime" luminescence method; typical sensor cap life > 4 years
		20 to 30 mg/l	0.01	0.15	
		30 to 50 mg/l	0.1	5%	
	% saturation	0 to 500% saturation	0.1%	corresponds with the accuracy of the concentration reading	
Conductivity	specific conductance, µS/cm	0 to 5000 µS/cm	4 digits with maximum of one decimal	±0.5% of reading ±0.001	corrected for temperature; four easy-to-clean graphite electrodes; optional sensor provides ±0.5% of reading accuracy to 100 mS/cm.
		0 to 10 mS/cm		±1% of reading ±0.001	
	specific conductance, mS/cm	10 to 100 mS/cm		1% of reading	
		100 to 275 mS/cm		2% of reading	
	salinity	0 to 70 PSS		0.01	
total dissolved solids (TDS)	0 to 65 g/	0.1	5% of reading	calculated from specific conductance	
Pressure	Depth	0 to 25 m	0.01	0.05	compensated for temperature and salinity; 0.05 m out of 25 m is 2" out of 100 feet; 0.4 m out of 200 m is a football length out of two football fields
		0 to 200 m		0.4	
	Vented depth (level)	0 to 10 m	0.001	0.003m	compensated for temp, salinity, barometric pressure
	Barometric pressure	400 to 900 mm Hg	0.1	1.5	included with depth sensor
Total dissolved gas (TDG)	400 to 1,400 mm Hg	0.1	1	compensated for temperature; maximum depth 15m	
Fluorometers	chlorophyll a - blue	0 to 500 µg/l	6 digits with maximum of two decimals	linearity of 0.99R <sup>2</sup>	highest-quality Turner Designs fluorometric sensors; fluorometers often require non-trivial calibration; custom optics available upon request
	chlorophyll a - red	0 to 500 µg/l			
	rhodamine dye	0 to 1000 ppb			
	Phycocyanin (freshwater BGA)	0 to 40,000 ppb			
	Phycocerythrin (marine BGA)	0 to 750 ppb			
	CDOM/tdDOM	0 to 1250 or 0 to 5000 ppb			
	CDOM/tdDOM custom	0 to 1250 or 0 to 5000 ppb			
	optical brighteners	0 to 15,000 ppb			
	tryptophan	0 to 20,000 ppb			
	fluorescein dye	0 to 500 ppb			
	refined oil	0 to 10,000pb			
crude oil	0 to 1500 ppb				
Ion-selective electrodes (ISE's)	ammonium	0 to 100 mg/l as nitrogen	0.1	5% or 2 mg/l	corrected for ionic strength (via conductivity readings); the accuracy specification relies on non-trivial maintenance practice and frequent calibration near the temperature of measurement; ammonium and nitrate require tip replacement every 3 - 6 months
	nitrate	0 to 100 mg/l as nitrogen			
	chloride	0 to 18,000 mg/l			
	sodium	0 to 20,000 mg/l			
	calcium	0 to 40,000 mg/l			
	bromide	0 to 80,000 mg/l			
PAR	photometric PAR	10,000 µmol/sm2	4 digits	5% of reading	LiCor spherical sensor

General Specifications	Proteus 30	Proteus 35	Proteus 40
Diameter	75 mm (2.95")	89 mm (3.5")	102 mm (4.00")
Length - w/o Battery Pack	483 mm (19")	483 mm (19")	483 mm (19")
Weight - with IBP	2.3 kg (5.0 lbs)	4.1 kg (9.0 lbs)	4.5 kg (10.0 lbs)
Number of sensors	Up to 7	Up to 11	Up to 13
Battery Pack	8 "C" cells	8 "C" cells	8 "C" cells

Internal Power Battery Life	1 to 24 month depending on sensors / logging rates	Sample Rate	1 Hz
External Power	5-30 vdc	Data Memory	>1,000,000 logged readings
Operating Temperature	-5 to 50 °C	Logging Rates	1 second to 1 day
Depth Rating	200 m	Warranty	2 years* * All sensors included except ISE's (Ammonia/nitrate/chloride)
Communications	RS-232, SDI-12, USB or Bluetooth	© 2016 RS Hydro Ltd. E&OE. All rights reserved. Patent Pending.	