



Proteus Water Quality Probe

An award-winning, patented, multi-parameter, real-time sensor platform to accurately and reliably measure BOD, COD, TOC, DOC, Coliforms (total, e.coli., faecal and e.ccoci) and up to 25 other parameters for permanent and temporary applications.



THE QUEEN'S AWARDS
FOR ENTERPRISE:
INNOVATION
2022



What is Proteus?



The Proteus is a multi-parameter water quality sensor that combines traditional sensors with cutting-edge fluorescence technology enabling a level of monitoring previously unachievable. Proteus aims to rejuvenate the way in which water quality testing is considered and undertaken by utilising a scientifically established organic matter proxy to deliver parameters which traditionally require laboratory time and specialist training. Proteus harnesses the intrinsic fluorescence of organic matter existing within the water and combines with other parameters into a scientifically proven algorithm to measure BOD, COD, TOC, DOC and Coliforms in real-time. Proteus has also been successfully used to accurately measure Total Phosphorous.

As a multi-parameter system, it can include a suite of other water quality sensors including turbidity, temperature, ISEs, Electrical Conductivity, pH/ORP and more, to produce a complete water quality monitoring tool that can be deployed directly into water sources or via flow cell/pumped sample lines. Proteus has flexibility of the user at its core with a range of power options and data delivery options for both attended and unattended monitoring. It's designed as a low maintenance, long-term economical option, suiting it to a range of different applications and environments.

Applications

- BOD/COD/TOC/DOC Loading to Wastewater Treatment Works
- Final Effluent Monitoring & Control
- WWTW Aeration Control & Energy Saving
- CSO Monitoring
- Coastal Water Monitoring
- Point Source Pollution Monitoring
- Coliform Monitoring (total, e.coli, faecal & enterococci)
- Efficiencies of Wastewater Treatment Works
- Diffuse Pollution Monitoring
- Groundwater Water Quality Monitoring
- Survey tool combined with Bluetooth®
- SCADA, RTU and logger integration via RS232, SDI-12, Modbus® RTU

Parameters include:

BOD, COD, TOC, DOC	Optical Brighteners	Refined Oils
Dissolved Oxygen	Nitrate	Ammonium
Pressure	ORP / REDOX	EC / Salinity / TDS
Chloride	Coliforms (total, e.coli., faecal and e.cocci)	Turbidity/TSS
pH	Tryptophan	Crude Oils
Temperature		CDOM

Benefits



Real-time Data:

Real-time Measurements of BOD / COD / TOC / DOC / Coliforms and up to 25 other parameters simultaneously



Applications:

Use in a wide range of applications in environmental, industrial, water and wastewater sectors



Deployable:

Easy to deploy with a range of internal and external power supplies



Low maintenance:

Self-cleaning optical sensors and a simple calibration every 6-12 months



Portable or Permanent:

Can be used as a portable system or installed in long term permanent applications



Monitoring:

Unparalleled range of standard and unique parameter



Cost Effective:

Reduced costs of manual sampling, maintenance visits and lab costs



Versatile:

Large range of sensors, power options and accessories makes the Proteus extremely versatile



Telemetry:

Can easily be connected to any wireless or SCADA/PLC based telemetry system



Low Power:

Power can be provided by an optional internal lithium battery pack or an external power source (battery, mains or solar).



Integration:

SCADA, RTU and logger integration via RS232, SDI-12, Modbus® RTU



Sensitive:

Unmatched sensitivity and ability to measure some parameters below laboratory minimum detection limits



Sensor Configuration

The Proteus can be configured with a wide range of sensors to best suit your application.

BOD / COD Sensor Configuration:

A standard Proteus sensor for BOD / COD will require a turbidity, temperature and tryptophan sensor. In some applications a CDOM sensor will also be required.

DOC / TOC Sensor Configuration:

A standard Proteus sensor for DOC / TOC will require a turbidity, temperature and CDOM sensor.

Coliforms (total, fecal and E. coli) Sensor Configuration:

A standard Proteus sensor for coliforms will require a turbidity, temperature and tryptophan sensor. In 75% of applications, a CDOM sensor will also be required.

Custom Sensor Configuration:

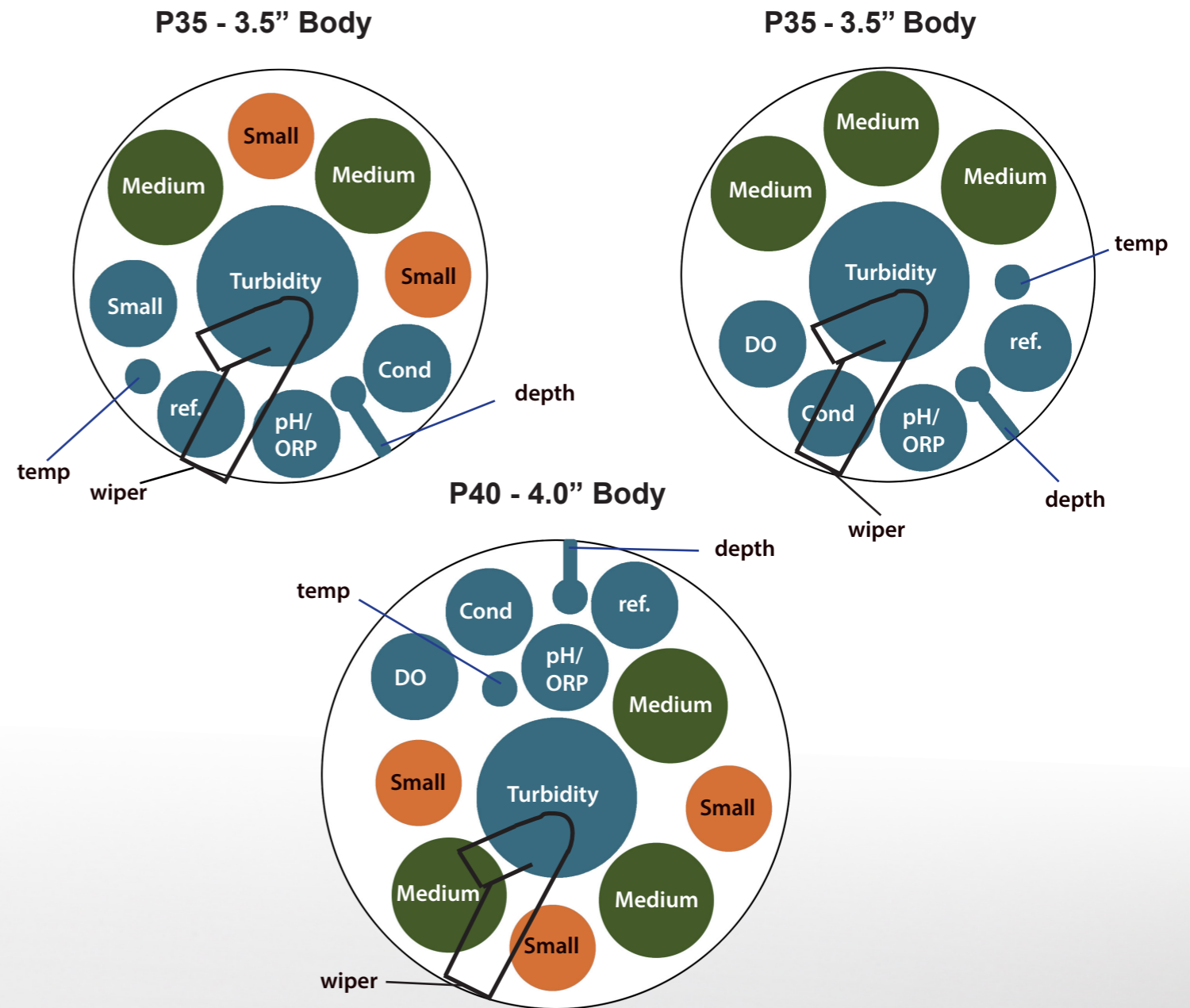
The Proteus can be fully configured with a custom amount of standard, small and medium sensors. Contact us with your requirements to find out what is possible.

Standard Sensors	Small Sensors	Medium Sensors
Temperature	Nitrate	Chlorophyll a
pH / ORP	Ammonium	BGA
Reference	Chloride	Rhodamine
Conductivity	Sodium	Crude oil
DO	TDG	Refined oil
Turbidity	Calcium	CDOM / FDOM
Depth / Vented depth	Bromide	Fluorescein
		Optical brighteners
		Tryptophan

Additional Sensor Notes

ORP is combined with pH and is optional on all sensors
 A small sensor may be substituted for any medium sensor
 Depth sensor is optional on all models

Sensor Configuration



Accessories & Deployment Options

Proteus Instruments offer a wide range of accessories, deployment and download options to ensure you have the most suitable solution for your application.



Permanent Telemetry Systems

Our permanent systems are mounted in small kiosks as standard but custom systems are available which can be solar powered, 12-24VDC externally powered or via mains AC/DC power). We also offer custom systems offering further integration such as additional 4-20mA signals, relay outputs, ethernet or modbus outputs.

Portable Telemetry Systems

Our portable telemetry systems, are self-contained in a ruggedised hard case. Simply connect the Proteus to the hard case connector, plug in the solar panel or external power supply and turn the system on using the master on/off switch. The case is small enough to allow easy transportation.



Data Buoys

The Proteus can be paired with a NexSens data buoy to provide offshore water quality monitoring. Data is sent straight back to your phone by the onboard telemetry unit. Ideal for deploying the Proteus in lakes, rivers, coastal waters or harbours.

Proteus Manager

The Proteus Manager is a simple programme that allows users to monitor, calibrate and setup their Proteus. The software provides calibration stability indication, QC information options in the permanent calibration log, single-point calibrations, visibility of "raw" sensor values, cut-and-paste of rolling data to MS Office documents, help screens, a custom parameter function and a built-in Mobile Version instruction manual.

Snapshot	Find Another Proteus
DATE	03/04/21
TIME	08:40:58
Temp	6.18 deg/C
Depth	0.10 m
pH	8.10 units



Flowcell

We provide flow cells and pumping systems for applications where samples can be delivered remotely from the source. Ideally suited to process and bank-side applications.

Proteus Mobile

Proteus Mobile wireless Bluetooth device provides an easy, cost effective, and versatile way to capture water quality data from multiparameter probes, using Bluetooth-enabled display devices.



Accessories & Deployment Options (continued)

Proteus Instruments provide a range of other accessories and options which can be requested from your local distributor.

Additional Accessories

- SDI-12/Modbus Converter
- Carry Case
- Flow Cell
- Copper Gauze
- Calibration fluids and powders
- Underwater cables
- Internal battery packs
- Bespoke Sampling Systems
- External Sampler Trigger Module



Recent Success Stories



H2Now - Chicago River, USA

The H2NOW platform is providing a guide to water quality in the Chicago river by estimating faecal coliform levels every 15 minutes from three spots along the river, through an array of novel technologies.

Proteus sensors have been installed in three locations and collect a series of measurements to estimate faecal coliform levels. Data are transmitted and displayed on the H2NOW portal.

[Read Full Case Study](#)



Southern Water Data Buoys, UK

The world's first real-time water quality data buoys for coliforms have been launched off the Tankerton and Portsmouth coastlines (2022).

The pilot is a world first and will give residents live updates in several of the area's most popular bathing water locations.

[Read Full Case Study](#)



The River Ganges, India

Every day, around three million litres of sewage is emptied into the Ganges – and only about half of that has undergone any kind of treatment. The rivers waters are so dirty that its considered one of the most polluted waterways in the world.

Proteus is being used to measure water quality real-time in the River Ganges.

[Read Full Case Study](#)

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Installation

We can devise installation plans for bespoke applications and can provide solutions for even the most difficult applications. All of your installations and site visits are available on a data portal to give you full traceability; providing serial numbers, photographs, commissioning data along with a comprehensive handover document with all the necessary manuals, specifications and documentation.



Consultancy

Our team of environmental scientists provide a comprehensive consultancy and data analysis service, covering all aspects of water quality / environmental monitoring. We can provide a rapid response service in the event of pollution incidents, monitoring the impact extent and tracking water quality recovery. All high frequency monitoring is coupled with grab sampling with subsequent analysis in UKAS accredited laboratories for quality control purposes. We can devise solutions for developing real-time monitoring and control systems for a range of water treatment processes. We can generate reports and analytics or can undertake all aspects of the monitoring.



Maintenance

All Proteus instruments can be provided with a comprehensive maintenance plan. This can cover all ancillary products required for calibration and on-going maintenance of the sensor or a full support service that can maintain the sensor systems operating performance and minimize lifecycle cost.



In-Situ Calibration

For long-term installations, we recommend a site calibration is undertaken to improve measurement accuracy. Proteus Instruments can either provide advice and devise a calibration program for you. Alternatively, we can undertake every aspect of the calibration for you including: development of a calibration plan and schedule, installation of refrigerated, MCERTS automatic samplers to avoid any sample degradation influencing the calibration procedure, collection of samples from monitoring locations across the UK; analysis of BOD/DOC/COD/TOC in UKAS accredited laboratory (ISO17025); and update calibration curve and necessary logs.



Data Only or Rental

A hassle free solution - Proteus installation, calibration, maintenance and data quality control all performed by our team of highly skilled engineers, technicians and scientists. All you need to do is let us know the parameters you want measured and the site location then leave the rest up to us. We can provide a range of bespoke analytics and real-time display solutions. In addition we can set up alerts, alarms and control when specific thresholds are exceeded.



Training

Full training can be provided for all aspects of the Proteus instruments range - from the science underpinning the technology through to the installation, application and interpretation of any data outputs. Training can be arranged at RS Hydro premises for up to 10 individuals and will cover both theory and hands on demonstration and application of the Proteus. Alternatively training can be provided off site (e.g. at installation site) on request.