Dartmouth Ocean Technologies Inc

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Dual Chemistry NP Sensor

Nitrate & Phosphate Detection

Cost Effective Solution to Real-Time, "Hands-Free" Measurement of Dual Chemistry Nitrate & Phosphate (NP) Concentrations

Nitrate & Phosphate Sensor C1000-200 Features at a Glance:

- Lab-on-Chip (LOC): Microfluidic wet-chemistry sensor featuring patented and proprietary "Inlaid Optical Cell Technology™"*
- Provides expanded insights into the water sample chemistry not available from a single chemical analysis
- Reduces reagent consumption, decreases reaction time, and reduces power draw
- Self-Powered and self-logging for real time measurement (data streaming available)
- Technology Flexibility: An excellent contender for towed systems, un-crewed vehicles, gliders, ROVs, Voluntary Observation Ships, buoys, and profiling floats
- Customizable and configurable to fit into most platforms

*U.S. Patent 11,231,356 B2

Nitrate & Phosphate Sensor - In-Situ Multi-Nutrient Detection

Autonomous

- Nitrate & Phosphate Sensor
- Reagent Housing
- Battery Housing
- Tri-mount Bracket
- Easy transport and deployment
- Sample time:
  2 hour triplicate*

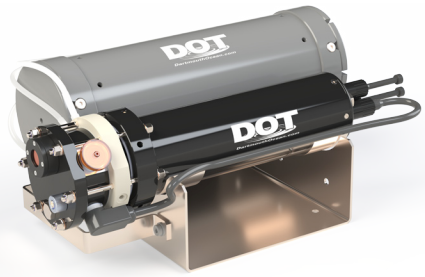
Autonomous deployment on a seafloor/river bed deployment frame

Sensor Payload

- Nitrate & Phosphate Sensor
- Reagent Housing
- 100 Nitrate samples or 33X Nitrate sample triplicates; 100 phosphate samples or 33X Phosphate sample triplicates; 40 Reference standards (for calibration) or13 standard triplicates**
- Reagent bags inside housing
- Requires power from platform
- Flexible mounting configurations

Sensor and Reagent Housing deployed on a V-Wing 1220, powered from EM tow cable

Platform-Mounted



- Nitrate & Phosphate Sensor
- Reagent Housing
- Dual Mount Bracket
- Typical configuration on platform with power

Nitrate & Phosphate Sensor and Reagent Housing mounted on Multi-Sensor Seafloor Platform (MSSP) by COVE

Specifications

Weight - In Air - In Salt Water	 5.0 kg (11.0 lbs) 2.2 kg (5.07 lbs)	**Dimensions:** - Diameter - Length	Sensor: Reagent: 114.3 mm (4.5 in) 139.7 mm (5.5 in) 508 mm (20 in) 400 mm (15.75 in)
Sample Rate:	1 / 15 minutes to 1 / day (programmable)	**Depth Rating:**	20 m (65 ft)
Intake Filter:	0.45µm pore size (default)	**Power Draw:**	Sleep: 0.23W; Idle:0.9W; Peak: 8.5W
Reagents:	• NIST traceable standards • Blue method (modified EPA 365.2) standard • Yellow method upon request	**Data Output:**	• Ethernet file upload/download • RS232 115200 baud 8N1 programming
Concentration Range:	10*** µM - 200 µM (0.6 - 12.5 mg/L) [nitrate[a]] 0.15 µM - 10 µM (0.014 - 0.95 mg/L) [orthophosphate[b]] 0.005 mg/L - 0.3 mg/L [orthophosphate-P]	**Options:**	• Mounting brackets • Software visualization • Real time data output • External battery case (Lithium Primary) • Hard, floodable reagent case

* Each triplicate is 3 phosphate and 3 nitrate measurements ** Based on DOT Dual NP reagent chemistry kit *** Improved limit of detection with longer sampling time. Specifications subject to change.

[a] Nitrate concentrations in seawater can reach up to 2.4 mg/L, mostly due to nitrification processes, but can exceed these levels from nutrient runoff.

[b] Canadian provincial restrictions range from 0.1 - 1 mg/L (total phosphorous) and less than 0.5 mg/L orthophosphate in effluent.

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