

# Nitrate sensor

Based on advanced lab-on-chip technology, this miniaturised microfluidic nitrate sensor performs lab-grade measurements in all liquid water environments. It can also be configured to measure just nitrite.



**High performance** - Sensitive wet-chemical analysis



**High-resolution data** - every 6 minutes (19 minutes when calibrated)



**User friendly** - Easily swappable reagents



**Long endurance** - Over 1000 readings per reagent set



**No drift** - Onboard calibration and standardisation



**Environmentally friendly** - Contained onboard waste storage



**Deep sea** - Deployable to 6000 m depth

## Specifications

Temperature range: 0-35 °C

Power consumption: 1.8 W

Range: 0.15 -1000 µM

Limit of Detection: 0.05 µM

Sample volume: 0.6 mL

Max depth: 6000 m

Comms: USB/serial

Total height: 56 cm

Applications: rivers/estuarine monitoring, aquaculture, ocean science, autonomous vehicles, wastewater monitoring

# Detailed Specifications

## Analytical

|                     |                                     |
|---------------------|-------------------------------------|
| Temperature range:  | 0-35 °C                             |
| Measurement range:  | 0.15 - 1000 µM<br>0.002 - 14 mg/L-N |
| Limit of Detection: | 0.05 µM<br>0.0007 mg/L-N            |
| Typical precision:  | 2%                                  |
| Sample matrix :     | Seawater or<br>freshwater           |

## Physical

|                   |         |
|-------------------|---------|
| Sample volume:    | 0.6 mL  |
| Max depth:        | 6000 m  |
| Filter pore size: | 0.45 µm |
| Weight in air:    | 7.5 kg  |
| Weight in water:  | 0.8 kg  |
| Max. diameter:    | 16 cm   |
| Total height:     | 56 cm   |

## Electrical

|                                        |                              |
|----------------------------------------|------------------------------|
| Comms:                                 | USB/serial                   |
| Supply voltage:                        | 10–16 V                      |
| Average current draw:                  | 150 mA                       |
| Max current draw:                      | 300 mA                       |
| Average measurement power consumption: | 1.8 W                        |
| Sleep current draw:                    | 0.5 mA                       |
| Connector:                             | Subconn Micro-circular 8-way |

## Two available configurations



**Cartridge configuration:** The sensor consists of two parts - the sensor housing (bottom) and the reagent housing (top). Sample fluid is drawn in for analysis via a 0.45 µm pore-size filter. All chemical waste is stored onboard the reagent housing, which contains onboard calibration fluids.

**Vehicle configuration:** The sensor can be configured (on request) with individual fluid storage bags rather than a reagent housing. This configuration is suitable for underwater vehicles or other applications where the reagent housing does not easily fit. Custom integrations available on request.

## Two deployment modes

**Time-series mode:** The sensor self-calibrates and measures on a user-defined schedule. Best suited for long-term fixed-location deployments.

**Profiling mode:** The sensor self-calibrates then performs a series of measurements at its fastest possible rate - best suited for profiling applications on

|                                 | Time-series | Profiling |
|---------------------------------|-------------|-----------|
| Measurement interval (minutes): | 19          | 6         |
| Measurements per reagent set:   | 1000        | ~3000     |
| Energy per measurement (J)      | 1620        | 540       |