Green Eyes
Environmental Observing Systems

NuLAB

Autonomous Nutrient Monitor for the Field, Plant or Lab

The NuLAB adapts established wet chemical methods to a field chemical analyzer. Precise volumes of sample, on-board standard and reagents connected to a rotary valve are mixed by a syringe pump and reacted solutions are analyzed in high precision colorimeters. In essence, the NuLAB is a rugged "chemistry robot" capable of various simultaneous analysis. Sample data is calibrated via preserved on-board standards that are analyzed at user specified intervals. Sample and reagent volumes, mixing times and flushing are controlled by straight-forward macros that can be customized by users or Green Eyes to achieve specific analytical goals.

Green Eyes' NuLAB – Autonomous Nutrient Monitor

Sensitive and specific wet chemistry methods	Individual channels for the analysis of nitrate, ortho-phosphate, ammonium and silicate
Calibration via preserved **on-board standard**	High reliability and dedicated support
Default or user customized chemistry	Biofouling control built in
Field Proven	Reagents and standards available to U.S customers

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Specification

Physical (two channel unit, add approximately 40% for additional channel)

- Analyzer: 39 cm x 34 cm x 20 cm (H x W x D)
- Weight: 6 kg plus reagents

Analytical

- Standard Ranges (detection limit to linear range)
  - Standard Ranges (detection limit to linear range, micro M)
    - High Sensitivity Detectors
      - **mg/L:** N+N 0.003 to 0.70, Nitrite 0.002 to 0.5, Phosphate 0.006 to 0.8, Ammonium 0.004 to 0.3, Silicate 0.008 to 1.7
      - **micro mol/L:** N+N 0.2 to 50, Nitrite 0.15 to 35, Phosphate 0.2 to 25, Ammonium 0.3 to 20, Silicate 0.3 to 60
    - Low Sensitivity Detectors
      - **mg/L:** N+N 0.01 to 2.8, Nitrite 0.008 to 2.1, Phosphate 0.025 to 2.0, Ammonium 0.02 to 1.0, Silicate 0.04 to 2.8
      - **micro mol/L:** Nitrate 0.8 - 200, Nitrite 0.6 - 150, Phosphate 1.0 - 75, Ammonium 1.5 to 75, Silicate 1.5 to 100

  - Precision (one SD @ midrange of scale): Nitrate 3%, Nitrite 2%, Phosphate 3%, Ammonium 3%, Silicate 3%
  - Expanded Ranges: Up to 5 mg/l through auto-dilution
  - Accuracy: Based on the accuracy of the preserved on-board standard and sample replicate precision
  - Analyses: Typically 1000 per channel, per deployment. Controlled by reagent payload and chemistry
  - Analysis Time: N+N 13min, Nitrite 9min, Phosphate 14min, Ammonium 17min, Silicate 16

- **Note:** detection limit calculated as 3 x SD of reagent blank; linear range is variable upon detector path length and chemistry. Contact Green Eyes for specific information.

General

- Power: voltage 10 - 15 dc, current per channel (mA) heating max. 820, motors 160-260, idle 90
- Communications: RS232 9600,N,8,1
- Not waterproof

Please contact Green Eyes to learn more about collecting high quality time-series nutrient data

NuLAB *monitoring nutrients in a waterproof enclosure on a Florida bay*

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