

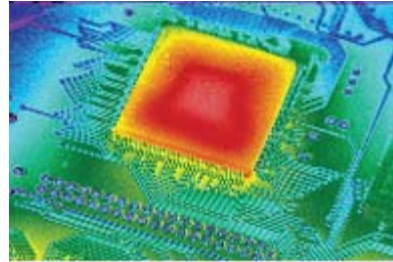


HOSKIN SCIENTIFIC LIMITED



ENVIRONMENTAL Monitoring

Sampling and monitoring instruments for air, water and soil for the environmental, agricultural, mining and forestry markets.



TEST & MEASUREMENT Instrumentation

Sensors, transducers & instrumentation for industry, manufacturing, research & development & factory automation.



GEOTECHNICAL & MATERIALS Testing

Testing Equipment for soil, asphalt, petroleum, concrete and cement.



RENTAL DEPARTMENT

Rental Instruments available for rent on a daily, weekly or monthly basis.

For over fifty years, Hoskin Scientific has been a supplier of testing and monitoring instrumentation to the Canadian market. With offices in Vancouver, Victoria, Edmonton, Burlington, Halifax and Montreal our customers are able to receive local sales and technical support in our three major departments



Submersible Ultraviolet Nitrate Analyzer



About Satlantic

- Located in Halifax, Nova Scotia
- Founded in 1991 by Dr. Marlon Lewis (Dalhousie Oceanography)
- In 2011 joined Sea-Bird & WET Labs in the SB-OMG
- Core product lines include:



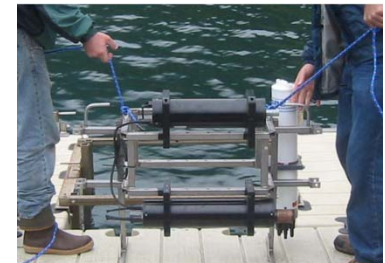
Radiometers



Fluorometers



Obs. Systems



Nutrient Sensors

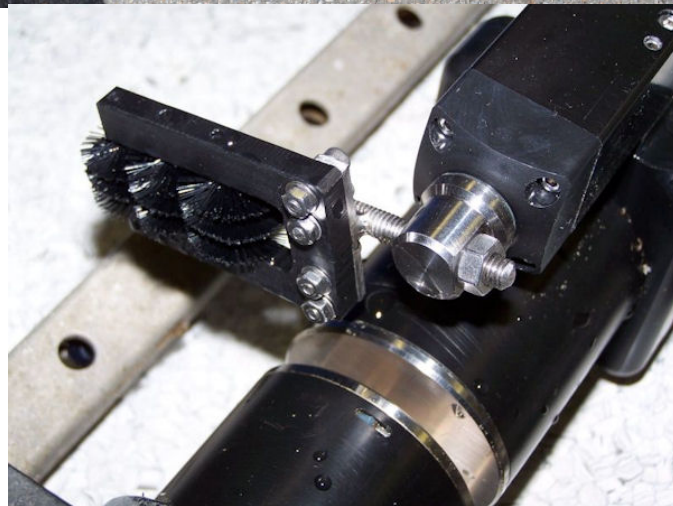
SUNA

- Introduced in 2008
- Developed from the original MBARI ISUS technology
 - Commercialized in 2003
 - Dr. Ken Johnson and Luke Coletti
- Large customer base in:
 - Oceanographic applications (e.g. CTD profiling, moorings)
 - Water Quality Monitoring (coastal, estuaries)
 - Freshwater pollution monitoring
 - AUV operation (Gliders, floats, etc)

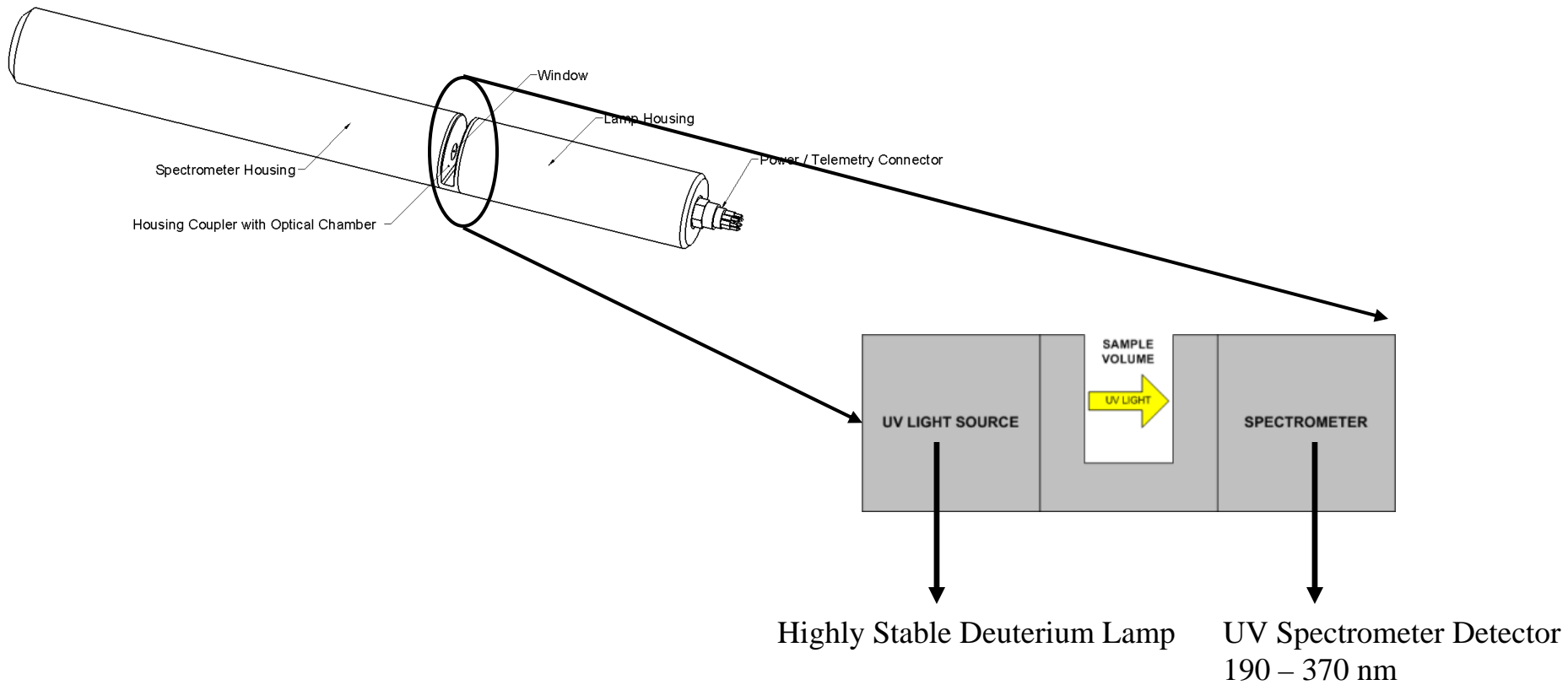


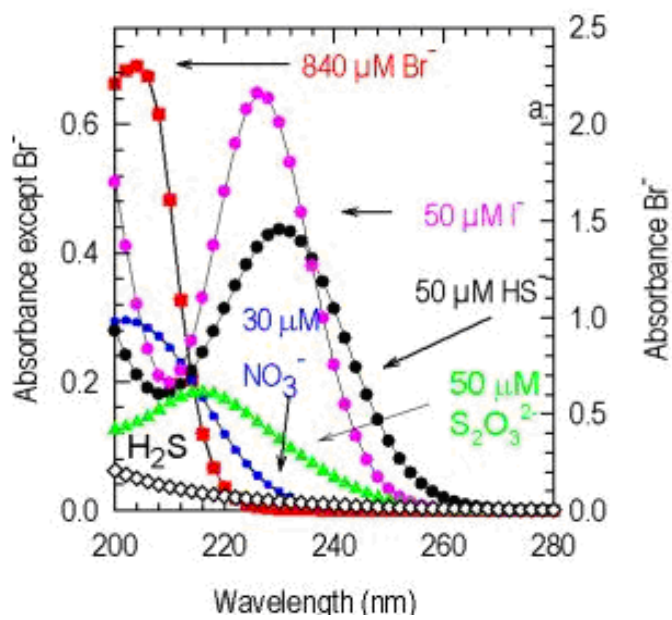
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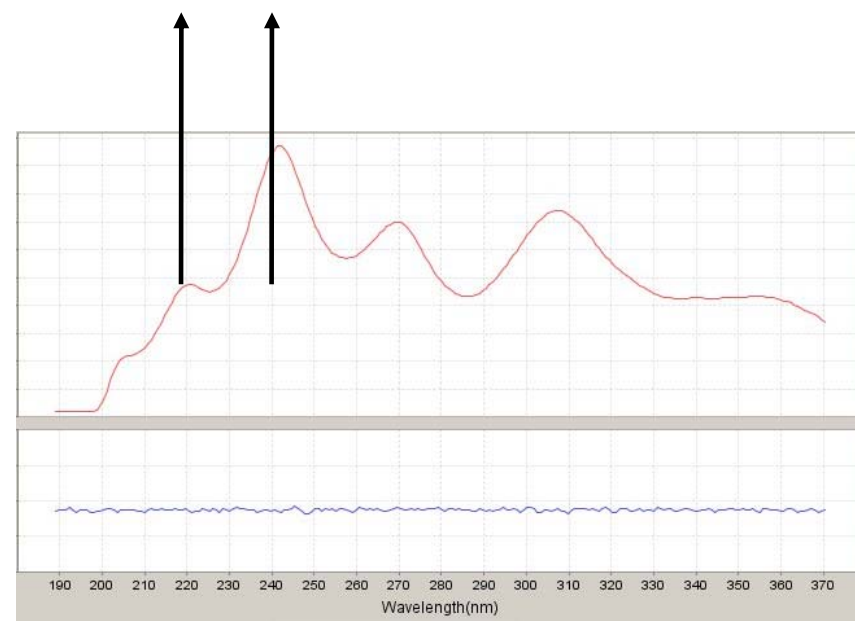


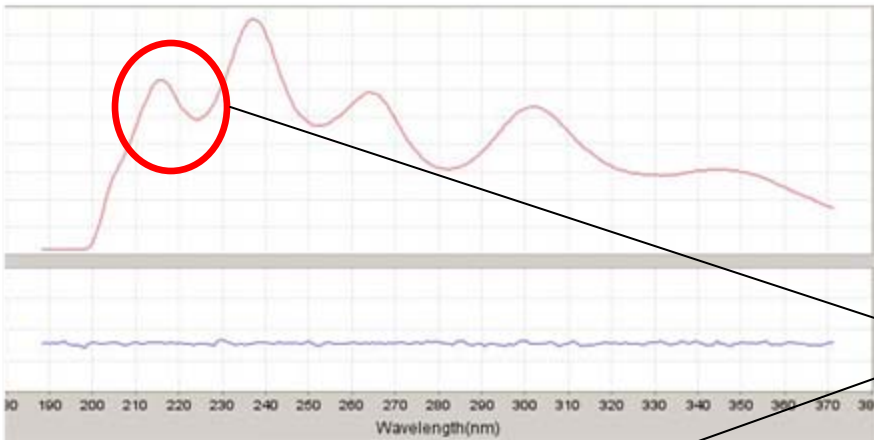
Principle of Operation





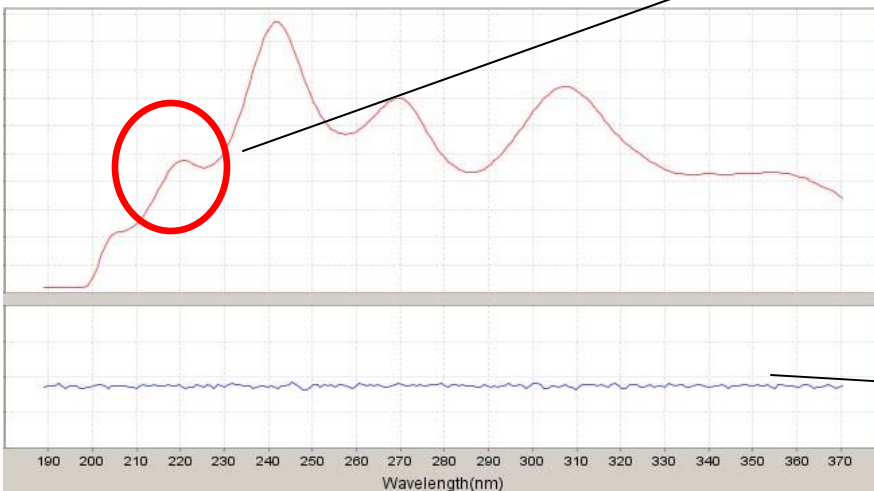
NO_3^- Fitting Range $\sim 220 - 240 \text{ nm}$





DIW- Nitrate Free Water

Absorption due to Nitrate



Nitrate Replete Water

Background

Performance Specifications

- Detection: 0.007 – 28 mg/L (0.5 to 2000 uM)
- Accuracy: +/- 0.028 mg/L (2 uM) or 10% of reading (whichever is greater)
- Drift less than 0.007 mg/L per hour of lamp on time



Instrument Specifications

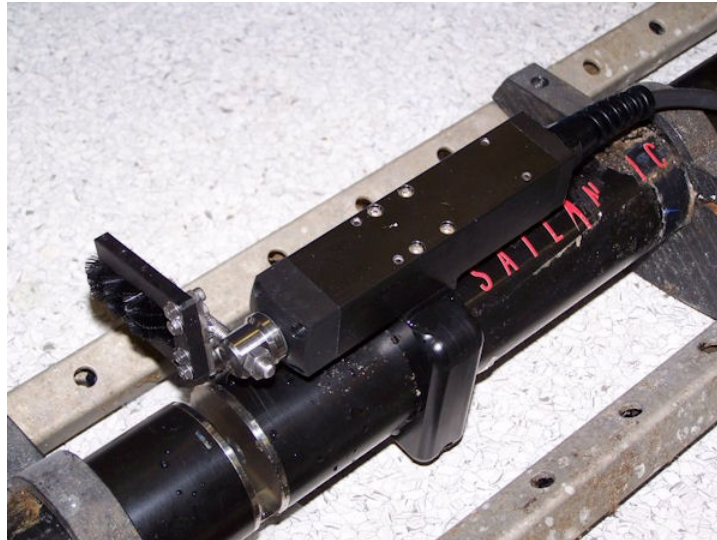
- 100 m, 1000 m and 2000 m depth rating available
- 8 – 18 VDC power input
- 7.5 W power draw (625 mA at 12 V)
- Sample rate 0.5 Hz
- Telemetry Interfaces: SDI-12, RS-232, Analog



NITRATE
A FRESH APPROACH
TO PROVEN TECHNOLOGY

Biofouling Accessories

- Cooper Foul Guard
- Flow Cell and Pump
- Zebra Tech Wiper



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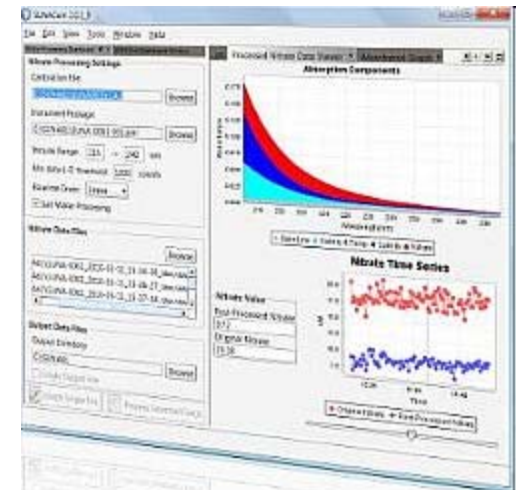


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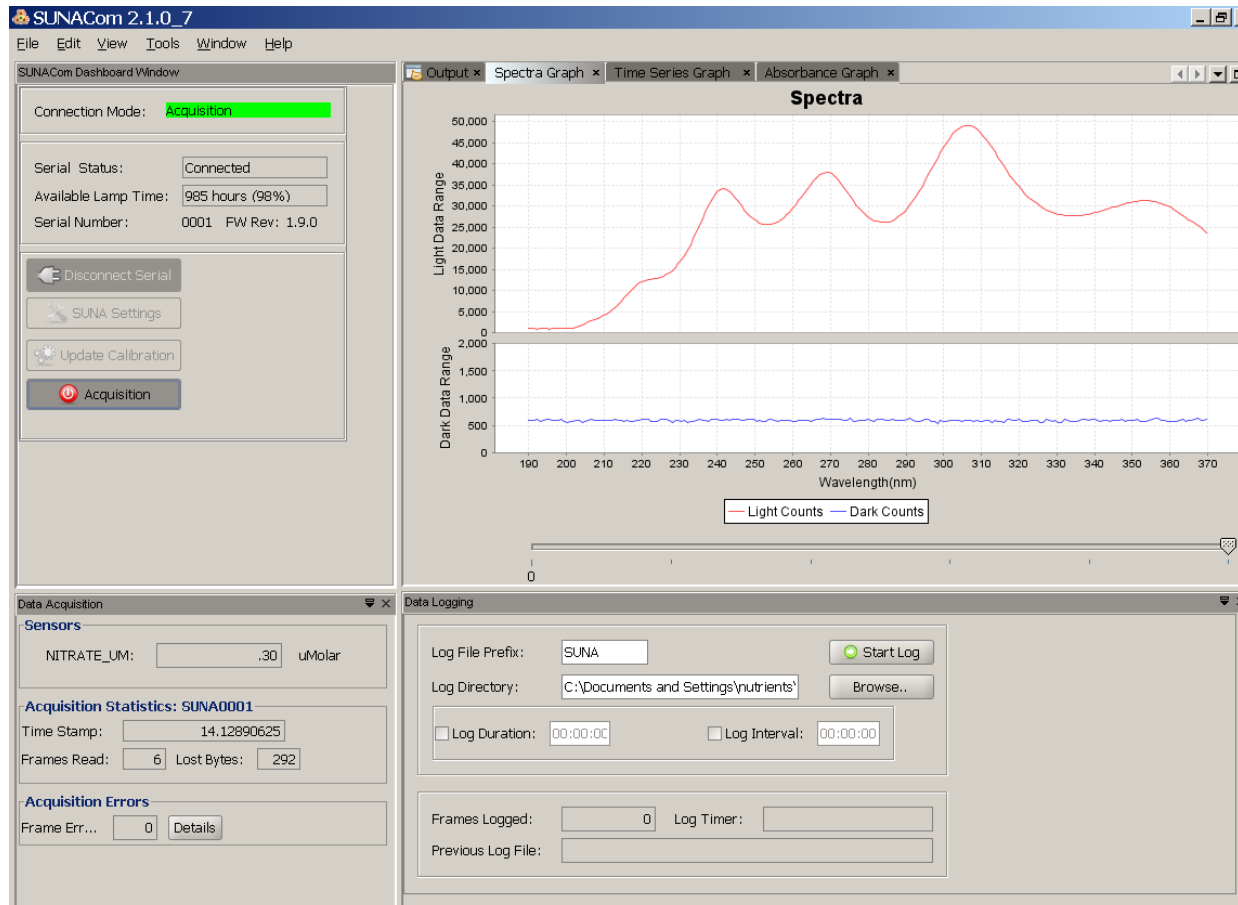
Video Showing ZebraTech Wiper on SUNA

Software - SUNACom

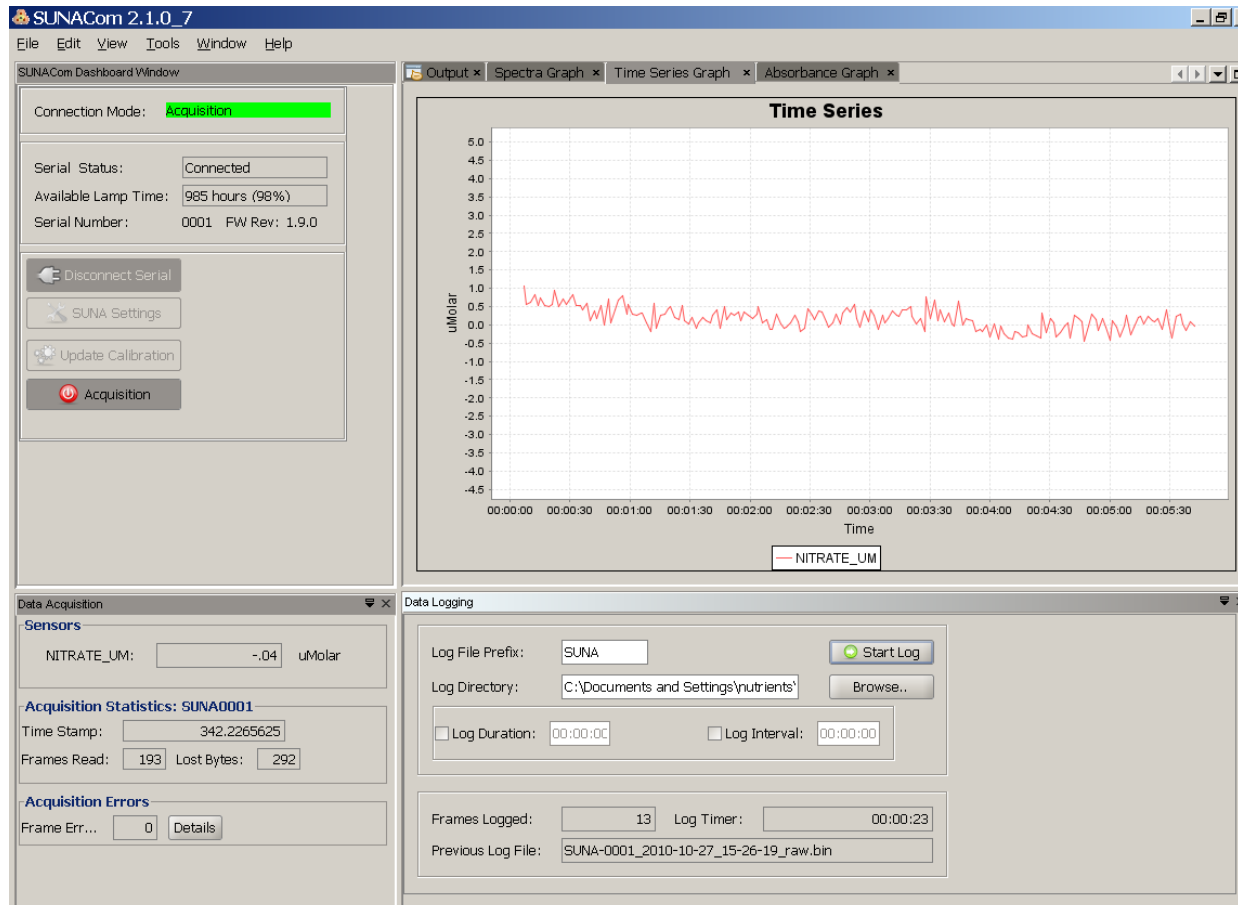
- Available for PC and Mac
- Programming of SUNA
- Viewing real-time data collection
- Reprocessing of previously logged data files
 - Both individual and batch processing
 - Apply updated calibration to collected data



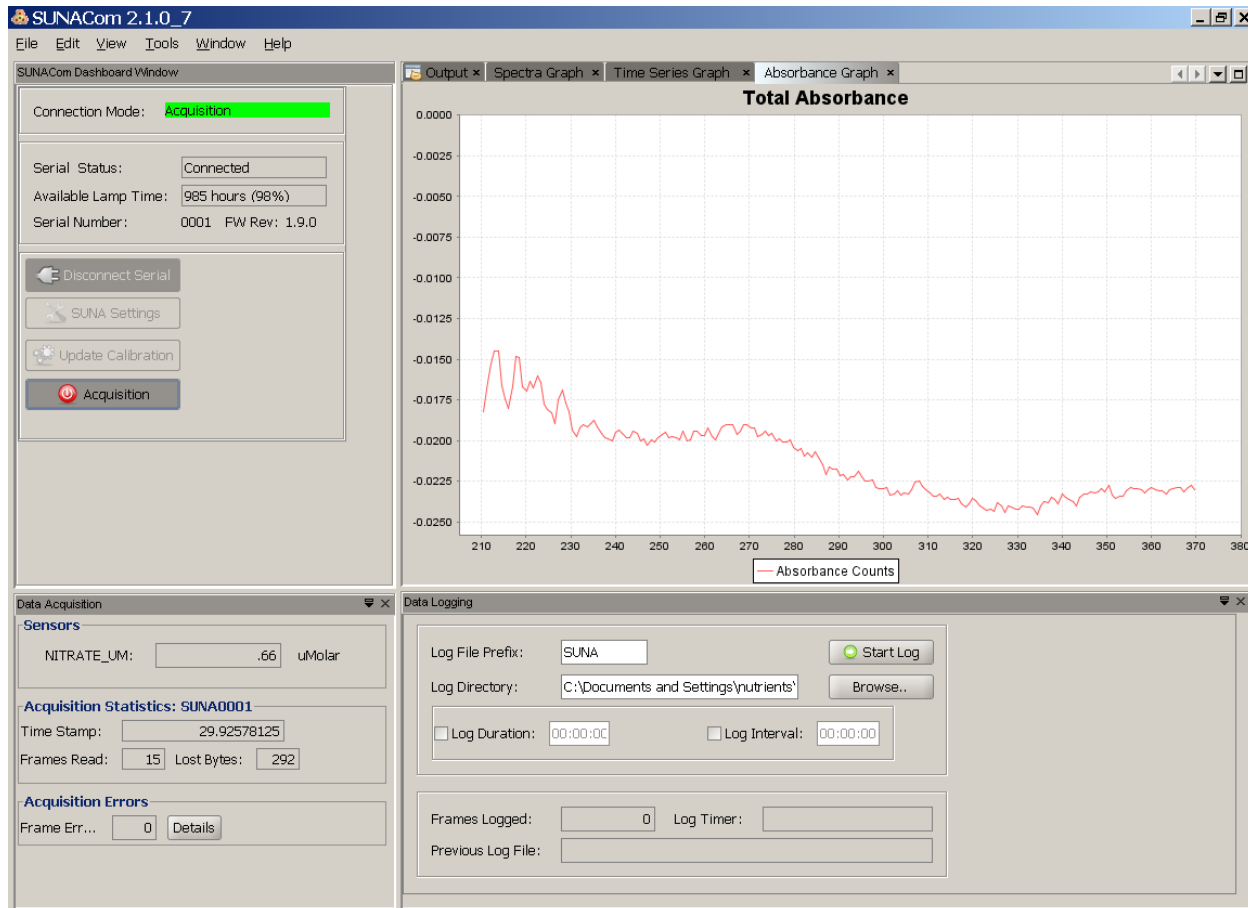
SUNACom – Spectra Graph



SUNACom – Time Series Graph



SUNACom - Absorbance Graph

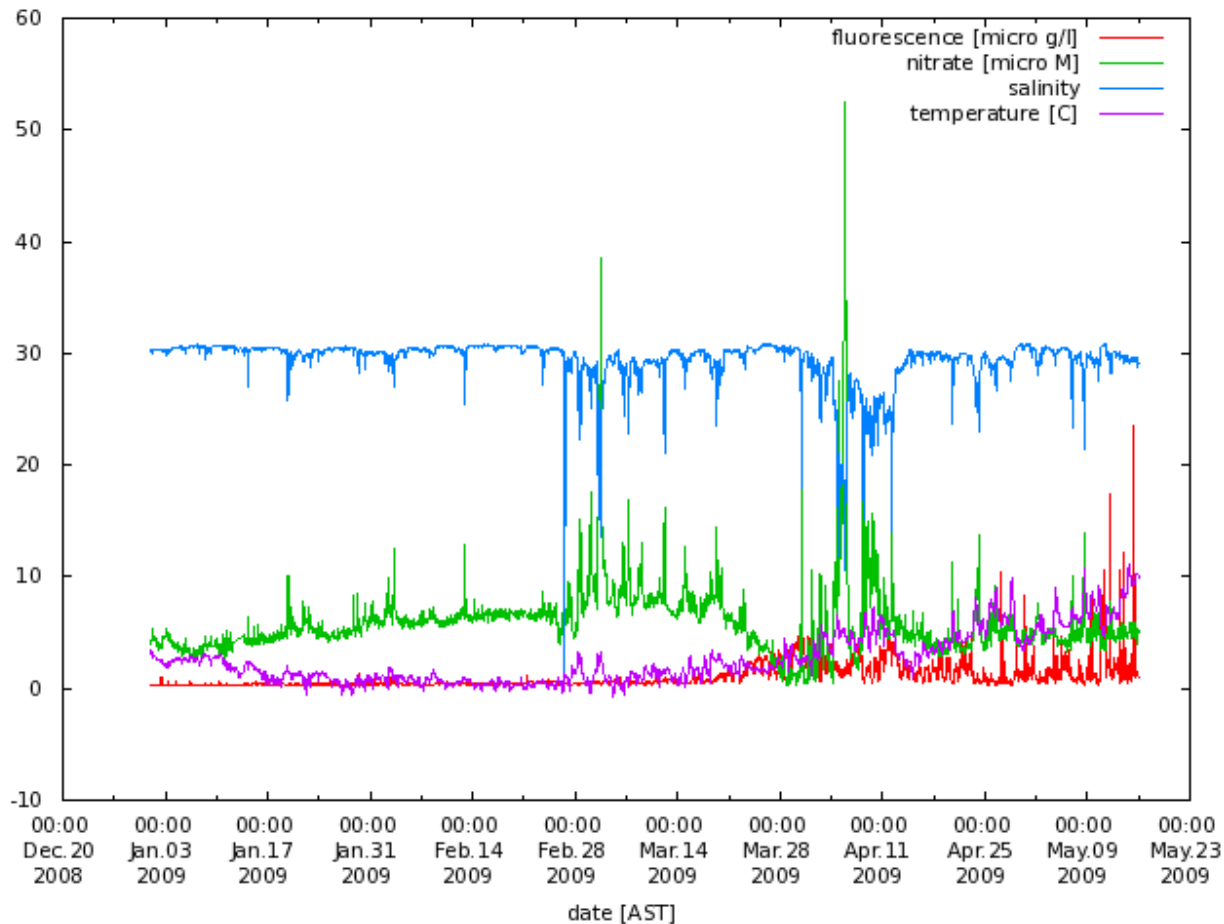


SUNACom – Nitrate Reprocessing

The screenshot displays the SUNACom 2.1.0.7 software interface, which is used for nitrate reprocessing. The interface is divided into several sections:

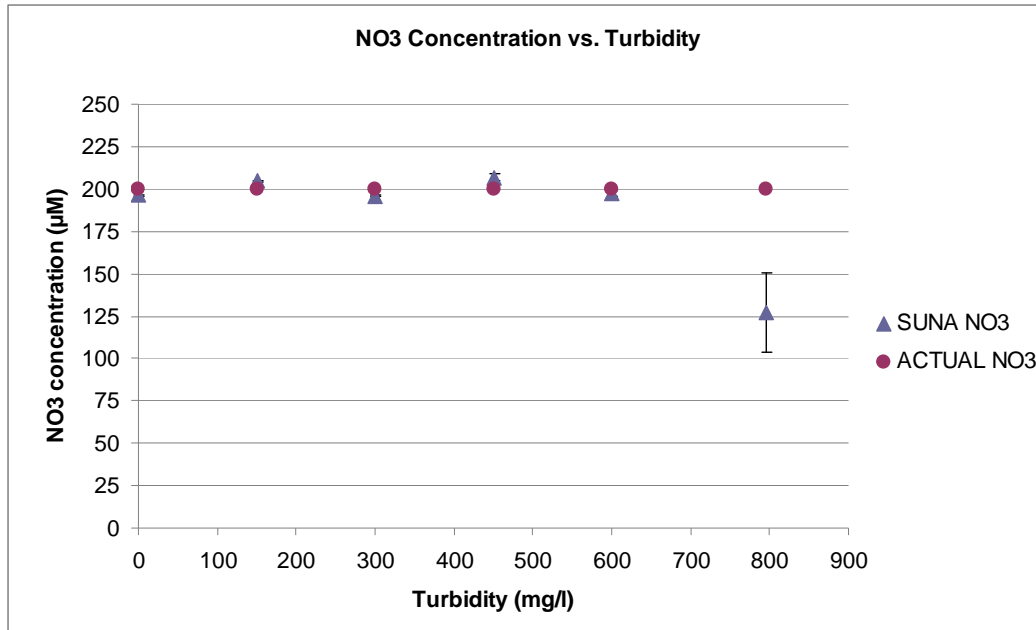
- Nitrate Processing Settings:** This section contains various configuration options:
 - Calibration File: `esktop\SUNA Data 121\SUNA121a.CAL`
 - Instrument Package: `SUNA\SUNA0121\SUNA_0121_001.xml`
 - Include Range: 216.5 to 240.0 nm
 - Min data L-D threshold: 1000 counts
 - Baseline Order: Linear
 - Salt Water Processing
- Nitrate Data Files:** A text field shows the file path: `\\Sbletto\SUNA\SUNA0121\RealityCheck\SUNA-012`.
- Output Data Files:** The output directory is set to `C:\temp\SUNA`. There are checkboxes for Single Output File and Graph Results.
- Absorption Components Graph:** A line graph showing Absorbance (y-axis, 0.00 to 0.45) versus Wavelength (nm) (x-axis, 217 to 239). The graph features four data series: BaseLine (grey), Salinity & Temp (cyan), Salinity (blue), and Nitrate (red). The Nitrate component shows a significant decrease in absorbance as wavelength increases.
- Nitrate Time Series Graph:** A line graph showing Nitrate Value (y-axis, 76 to 78 μ M) versus Time (x-axis, 12:58:35 to 12:59:40). It compares Original Nitrate (red squares) and Post-Processed Nitrate (blue circles). The values fluctuate between approximately 76 and 78 μ M.
- Nitrate Value Summary:**
 - Post-Processed Nitrate: 76.41
 - Original Nitrate: 76.79
- Data Logging:** A section for configuring data logging:
 - Log File Prefix: SUNA
 - Log Directory: C:\temp\SUNA
 - Log Duration: 00:00:00
 - Log Interval: 00:00:00
 - Frames Logged: 0
 - Previous Log File: (empty)

Northwest Arm of Halifax Harbour 44°37'44.7" N, 63°35'29.4" W



Data Available online @:

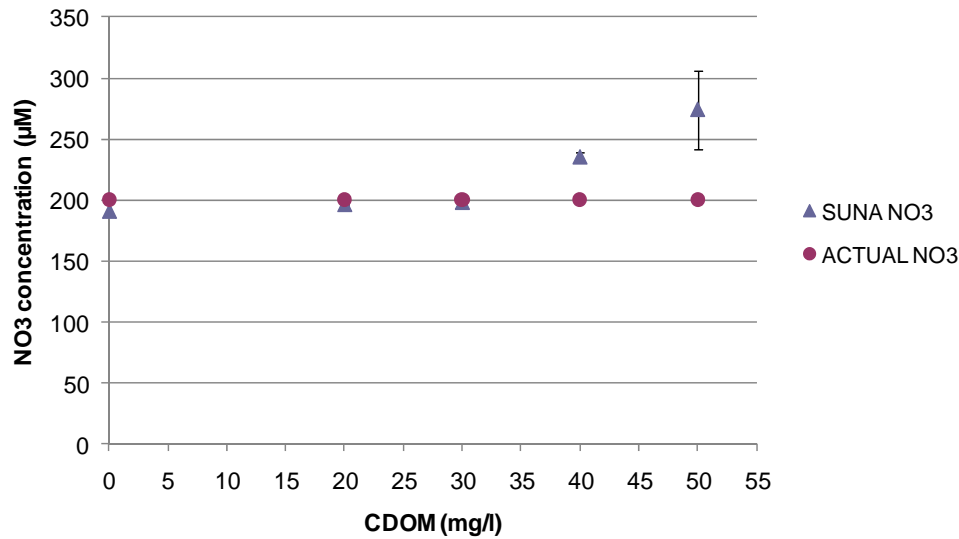
<http://lobo.satlantic.com>



- Ongoing experiments at Dalhousie University
- Using Arizona River Dust Turbidity Standards
- Actual NO₃ is an average of 10 samples

Actual NO ₃ (µM)	200	200	200	200	200	200
Turbidity (mg/L)	0	150	300	450	600	796
Turbidity (NTUs)	0	59.95	140	227.5	290	437
SUNA NO ₃ (uM)	196.184	204.543	195.983	206.773	197.412	127.328
Std Deviation	0.71	0.85	1.75	6.37	4.71	73.90

NO3 Concentration vs. CDOM



- Ongoing experiments at Dalhousie University
- Using Suwannee River Fulvic Acid Standards
- Actual NO3 is an average of 10 samples
- QSU (quinine sulphate unit) is a standardized measure of CDOM

Actual NO ₃ (µM)	200	200	200	200	200
CDOM (mg/L)	0	20	30	40	50
CDOM (QSU)	0	200	300	400	500
SUNA NO ₃ (uM)	191.016	196.447	198.21	235.291	273.985
Std Deviation	0.572	1.902	2.862	14.262	100.669

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Questions and Comments?

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