



SPECIFICATIONS FOR NITRATE INSTRUMENTS ON FIXED PLATFORMS

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Specifications for Nitrate Instruments on Fixed Platforms

Document Control Sheet

Version	Date	Description	Originator
0-01	2010/08/25	Initial draft	Wade Smith (Noblis)
0-02	2010/11/17	Formatting Revisions; performance revisions based on SWG discussions 8/11/2010	Noblis
0-03	2010/12/13	Revisions from SME (Banahan) and IO engineers D. Manalang and S. White.	Noblis
0-04	2011/01/11	Revisions from OL SSE	Noblis
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0-06	2011/02/01	Incorporated adjudicated 5- day review comments; Specifications corrected to reflect application on CG fixed platforms and on RSN shallow water (winched) profilers	Noblis
0-07	2011/03/02	Changed text in NITR-008 to reference Appendix A-1, which identifies the different deployment intervals for the two series of instruments.	Noblis
1-00	2011/03/02	Initial Release	Ed Chapman
1-01	2011/05/27	Administrative change to appendix table. Removed acronyms and Section 3.	Arthur Salwin (Noblis)
1-02	2011/06/27	Removed survivable depth	Arthur Salwin (Noblis)

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Signature Page

This document has been reviewed and approved for release to Configuration Management.

A handwritten signature in black ink, consisting of several loops and a long horizontal stroke extending to the right.

OOI Senior Systems Engineer: _____

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1 General

1.1 Ocean Observatories Initiative (OOI) Overview

See “Common Specifications for Instruments on Fixed Platforms”

1.2 Document Scope and Purpose

This document contains the specifications for the instrument to measure dissolved nitrate (NO_3^-) in seawater. These instruments will be used on fixed platforms/locations and on shallow water (winched) profilers in the OOI.

1.3 Documents

1.3.1 Informational

The documents listed in this section are for informational purposes only and may not have been referenced in this specification.

- Consortium for Ocean Leadership, Inc. 2010, “Final Network Design”, Washington, D.C. [Online] Available: <http://www.oceanleadership.org/programs-and-partnerships/ocean-observing/ooi/network-design/>

1.3.2 Applicable

These documents contain requirements and specifications applicable to the instrument specified. The referenced section, requirement, or specification shall be met by the instrument specified herein.

“Common Specifications for Instruments on Fixed Platforms”, document control number 1336-00000

1.4 Definitions

1.4.1 Glossary and Acronyms

See “Common Specifications for Instruments on Fixed Platforms”

1.4.2 Conventions

All values contained in this document are Threshold Values unless specifically stated otherwise.

The bidder shall ignore the references in angle brackets < > at the end of each specification. They are for internal OOI use only.

2 Specifications

The instrument shall meet the requirements specified in the “Common Specifications for Instruments on Fixed Platforms,” document control number 1336-00000. Parameters specified in neither the “Common Specifications for Instruments on Fixed Platforms” nor in this document are not applicable (marked as N/A).

Specifications for Nitrate Instruments on Fixed Platforms

2.1 Measurement

Values provided are threshold unless otherwise stated.

2.1.1 Nitrate in seawater (NO_3^-)

a) Measurement with unit(s)

Dissolved Nitrate (micromolar; μM)

b) Minimum Value

NITR-001 The instrument shall measure dissolved nitrate (NO_3^-) in seawater over a range with a minimum value of 0.5 μM <L4-CG-IP-RQ-234, L4-RSN-IP-RQ-327, L2-SR-RQ-3130>

NITR-002 The instrument should measure dissolved nitrate (NO_3^-) in seawater over a range with a minimum value of 0.03 μM . This is an objective. <L4-CG-IP-RQ-556, L4-RSN-IP-RQ-614, L2-SR-RQ-3795>

c) Maximum Value

NITR-003 The instrument shall measure dissolved nitrate (NO_3^-) in seawater over a range with a maximum value of 50 μM <L4-CG-IP-RQ-234, L4-RSN-IP-RQ-327, L2-SR-RQ-3130>

d) Accuracy

NITR-004 The instrument shall measure dissolved nitrate (NO_3^-) in seawater with an accuracy of $\pm 2 \mu\text{M}$ for nitrate concentrations below 20 μM <L4-CG-IP-RQ-233, L4-RSN-IP-RQ-328, L2-SR-RQ-3508>

NITR-005 The instrument should measure dissolved nitrate (NO_3^-) in seawater with an accuracy of $\pm 0.05 \mu\text{M}$ for nitrate concentrations below 20 μM . This is an objective. <L4-CG-IP-RQ-557, L4-RSN-IP-RQ-615, L2-SR-RQ-3796>

NITR-006 The instrument shall measure dissolved nitrate (NO_3^-) in seawater with an accuracy of $\pm 10\%$ for nitrate concentrations at or above 20 μM <L4-CG-IP-RQ-403, L4-RSN-IP-RQ-329, L2-SR-RQ-3509>

e) Precision

NITR-007 The instrument shall measure dissolved nitrate (NO_3^-) in seawater with a precision of $\pm 2\%$ of the measured value. <L4-RSN-IP-RQ-330, L2-SR-RQ-3510, L4-CG-IP-RQ-558>

f) Resolution

Not specified.

g) Drift

NITR-008 The instrument shall measure dissolved nitrate (NO_3^-) in seawater with a drift of no greater than 4 μM over a deployment interval as

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defined in Appendix A-1 <L4-CG-IP-RQ-404, L4-RSN-IP-RQ-334, L2-SR-RQ-3514>

h) Response Times

Not specified.

i) Sampling Frequency

NITR -009 The instrument shall be capable of measuring dissolved nitrate at a sampling frequency of 1Hz <L4-CG-IP-RQ-239, L2-SR-RQ-3511, L2-SR-RQ-3512, L4-RSN-IP-RQ-331>

See Appendix A-1 for typical sampling frequencies.

j) Dependencies

Not specified

2.2 Operational

2.2.1 Operational Depth Range

See Appendix A-1 for operational depth ranges.

2.2.2 Environmental

See the “Common Specifications for Instruments on Fixed Platforms”

2.2.3 Service Requirements

See the “Common Specifications for Instruments on Fixed Platforms”

2.2.4 Calibration Requirement

See the “Common Specifications for Instruments on Fixed Platforms”

2.2.5 Maintenance

See the “Common Specifications for Instruments on Fixed Platforms”

2.3 Mechanical/Physical

See the “Common Specifications for Instruments on Fixed Platforms”

2.4 Electrical

See the “Common Specifications for Instruments on Fixed Platforms”

2.5 Data Storage and Processing

See Appendix A-1 for storage capacities at the typical sampling frequency.

See also the “Common Specifications for Instruments on Fixed Platforms”

2.6 Software/Firmware

See the “Common Specifications for Instruments on Fixed Platforms”

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2.7 Platform Interfaces

See the “Common Specifications for Instruments on Fixed Platforms”

2.8 Compliance

See the “Common Specifications for Instruments on Fixed Platforms”

2.9 Safety

See the “Common Specifications for Instruments on Fixed Platforms”

2.10 Shipping and Storage

See the “Common Specifications for Instruments on Fixed Platforms”

2.11 Identification

See the “Common Specifications for Instruments on Fixed Platforms”

2.12 Quality

See the “Common Specifications for Instruments on Fixed Platforms”

3 Appendices

A-1. Specification Values by the Platform on which the Dissolved Nitrate Instruments are Deployed

The following table describes the performance and operational constraints, limits, etc. that are different between the different OOI platforms.

Specifications for Nitrate Instruments on Fixed Platforms

Instrument Series	Cabled	Location	Operational depth range (m)	Required Sampling Frequency Capability	Typical Sampling Frequency	Deployment Interval (months)	Inductive Modem Required	Internal Batteries Required	Internal data Storage Required (# of samples)
A	C	O	0-300	1/sec	1/sec	13	N	N	N
B	U	C	0-10	1/sec	2/hr	7	N	(see note 1)	Y(20,000)

Key:

Cabled:

C denotes platforms attached to the electro-optic cable in the Pacific Northwest (cabled)
 U denotes platforms that have no cable connection to shore for power or data (uncabled)

Location:

O is open ocean
 C is coastal

(See the OOI Final Network Design Document for a description of the arrays.)

Series A will be deployed on a shallow water (winched) profiler.

Note 1: Internal batteries are optional on some of the instrument series B platforms. These batteries shall be capable of providing power for the specified Deployment Interval while sampling at the indicated Typical Sampling Frequency.