



# SPECIFICATIONS FOR SPECTRAL IRRADIANCE INSTRUMENTS ON FIXED PLATFORMS

Version 1-00-P  
Document Control Number 1336-00006  
2010-12-13

Consortium for Ocean Leadership, Inc.  
1201 New York Ave NW, 4<sup>th</sup> Floor, Washington DC 20005  
[www.OceanLeadership.org](http://www.OceanLeadership.org)

in Cooperation with

University of California, San Diego  
University of Washington  
Woods Hole Oceanographic Institution  
Oregon State University  
Scripps Institution of Oceanography

## Specifications for Spectral Irradiance Instruments on Fixed Platforms

---

### Document Control Sheet

Version	Description
1-00-P	Public Version

Note: This document has been edited to remove information that is considered confidential and/or sensitive to ongoing or future financial negotiations for OOI procurements. Information removed has been replaced by the insertion of "[redacted]".

### Signature Page

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

OOI Senior Systems Engineer: \_\_\_\_\_



## Specifications for Spectral Irradiance Instruments on Fixed Platforms

---

### Table of Contents

1	General .....	1
1.1	Ocean Observatories Initiative (OOI) Overview .....	1
1.2	Document Scope and Purpose.....	1
1.3	Documents.....	1
1.3.1	Informational .....	1
1.3.2	Applicable .....	1
1.4	Definitions .....	1
1.4.1	Glossary and Acronyms .....	1
1.4.2	Conventions .....	1
2	Specifications.....	2
2.1	Measurement .....	2
2.1.1	Downwelling spectral irradiance .....	2
2.2	Operational .....	3
2.2.1	Operational Depth Range.....	3
2.2.2	Environmental .....	3
2.2.3	Service Requirements.....	3
2.2.4	Calibration Requirement .....	3
2.2.5	Maintenance Interval.....	3
2.2.6	Survivable Depth.....	3
2.3	Mechanical/Physical.....	3
2.4	Electrical .....	4
2.5	Data Storage and Processing .....	4
2.6	Software/Firmware .....	4
2.7	Platform Interfaces .....	4
2.8	Compliance .....	4
2.9	Safety.....	4
2.10	Shipping and Storage.....	4
2.11	Identification.....	4
2.12	Quality.....	4
3	Documentation .....	4
4	Appendices .....	4
A-1.	Specification Values by the Platform on Which the SPKIR Instruments are Deployed.....	4

# Specifications for Spectral Irradiance Instruments on Fixed Platforms

---

## 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 Spectral Irradiance (SPKIR) instruments that will be deployed on fixed platforms to measure downwelling spectral irradiance.

The instrument shall meet the requirements in this document and those 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. This instrument specification shall have precedence over the Common Specification for conflicting items.

### 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

- **SPKIR** – Spectral irradiance
- See “Common Specifications for Instruments on Fixed Platforms” for other definitions.

#### 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.

## Specifications for Spectral Irradiance Instruments on Fixed Platforms

---

### 2 Specifications

#### 2.1 Measurement

Values provided are threshold unless otherwise stated.

##### 2.1.1 Downwelling spectral irradiance

###### a) Measurement with unit(s)

Downwelling spectral irradiance ( $\mu\text{mol photons m}^{-2} \text{s}^{-1}$ )

###### b) Minimum Value

SPKI-001 The instrument shall measure downwelling spectral irradiance over a range with a minimum value of  $0.1 \mu\text{mol photons m}^{-2} \text{s}^{-1}$  across the entire wavelength range specified in section 2.1.1k. <L2-SR-RQ-3528, L4-CG-IP-RQ-377, L4-RSN-IP-RQ-494>

###### c) Maximum Value

SPKI-002 The instrument shall measure downwelling spectral irradiance over a range with a maximum value of  $2000 \mu\text{mol photons m}^{-2} \text{s}^{-1}$  across the entire wavelength range specified in section 2.1.1k. <L2-SR-RQ-3528, L4-CG-IP-RQ-377, L4-RSN-IP-RQ-494>

###### d) Accuracy

SPKI-003 The instrument shall measure downwelling spectral irradiance with an accuracy within  $\pm 5\%$  of the true value. <L2-SR-RQ-3527, L4-CG-IP-RQ-374, L4-RSN-IP-RQ-493>

###### e) Precision

SPKI-004 The instrument shall measure downwelling spectral irradiance with a precision of  $0.01 \mu\text{mol photons m}^{-2} \text{s}^{-1}$ . <L2-SR-RQ-3781, L4-CG-IP-RQ-527, L4-RSN-IP-RQ-595>

###### f) Resolution

Not specified.

###### g) Drift

Not specified.

###### h) Response Times

Not specified.

###### i) Sampling Frequency

SPKI-005 The instrument shall be capable of measuring downwelling spectral irradiance at a sampling frequency of 1Hz. <L2-SR-RQ-3530, L4-CG-IP-RQ-208, L4-RSN-IP-RQ-495>

The typical sampling frequency will be 1 Hz.

## Specifications for Spectral Irradiance Instruments on Fixed Platforms

---

### j) Dependencies

Not specified.

### k) Wavelength range

SPKI-006 The instrument shall measure downwelling spectral irradiance over the wavelength range of 380 nm to 720 nm. <L2-SR-RQ-3526, L4-CG-IP-RQ-206, L4-RSN-IP-RQ-490>

SPKI-007 The instrument should measure downwelling spectral irradiance over the wavelength range of 380 nm to 750 nm. This is an objective. <L2-SR-RQ-3780, L4-CG-IP-RQ-526, L4-RSN-IP-RQ-593>

### l) Number of bands

SPKI-008 The instrument shall measure downwelling spectral irradiance in no fewer than 7 bands over the wavelength range specified in section 2.1.1.k. <L2-SR-RQ-3668, L4-CG-IP-RQ-373, L4-RSN-IP-RQ-491>

### m) Spectral Bandwidth

SPKI-009 The instrument shall have spectral bandwidths of no more than 20 nm. <L2-SR-RQ-3669, L4-CG-IP-RQ-207, L4-RSN-IP-RQ-492>

## 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 Interval

See the “Common Specifications for Instruments on Fixed Platforms”

### 2.2.6 Survivable Depth

See Appendix A-1 for survivable depths.

## 2.3 Mechanical/Physical

See the “Common Specifications for Instruments on Fixed Platforms”

## **Specifications for Spectral Irradiance 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”

### 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 Documentation**

See the RFP for documentation that the vendor shall be required to supply.

## **4 Appendices**

### A-1. Specification Values by the Platform on Which the SPKIR Instruments are Deployed

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

## Specifications for Spectral Irradiance Instruments on Fixed Platforms

SPKIR Series	Cabled	Location	Operational depth range (m)	Survivable depth (m)	Deployment Interval (months)	Internal Batteries Required	Internal data Storage Required (# of samples)
A	C	O	0-300	300	13	N	N
B	U	C	0-10	600	7	N (see note 1)	Y(20,000,000)

### 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

Series A is on the Regional Cabled Array

Series B is on the uncabled Coastal Array

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

**Note 1:** Internal batteries are optional on some of the SPKIR series B platforms.