|  |
| --- |
|  |

|  |
| --- |
| **WP3.2.1** |
| SensorML common profiles for EMODNET |
|  |
|  |
|  |
| **Kokkinaki, Alexandra BODC** |
| **6/17/2017** |
|  |

Table of Contents

[Common SensorML profiles 5](#_Toc485492823)

[SWE Marine Profiles Group 5](#_Toc485492824)

[Overview 6](#_Toc485492825)

[PLATFORM MODELS 6](#_Toc485492826)

[IDENTIFIERS 6](#_Toc485492827)

[List of terms: 7](#_Toc485492828)

[Minimum terms: 7](#_Toc485492829)

[Status: 7](#_Toc485492830)

[CLASSIFICATION 7](#_Toc485492831)

[List of terms: 7](#_Toc485492832)

[Candidate terms: 7](#_Toc485492833)

[Status: 7](#_Toc485492834)

[CAPABILITIES 8](#_Toc485492835)

[List of terms: 9](#_Toc485492836)

[Mandatory terms: 9](#_Toc485492837)

[Status: 9](#_Toc485492838)

[CHARACTERISTICS 9](#_Toc485492839)

[List of terms: 10](#_Toc485492840)

[Possible terms: 10](#_Toc485492841)

[Status: 10](#_Toc485492842)

[Contacts 10](#_Toc485492843)

[Documentation 12](#_Toc485492844)

[PLATFORM INSTANCES 13](#_Toc485492845)

[IDENTIFIERS 13](#_Toc485492846)

[**List of terms:** 14](#_Toc485492847)

[**Mandatory terms:** 14](#_Toc485492848)

[**Status:** 14](#_Toc485492849)

[KEYWORDS 15](#_Toc485492850)

[CAPABILITIES (if additional from the model add here. if different add them in the output) 15](#_Toc485492851)

[CHARACTERISTICS (Additional characteristics diff from model) 16](#_Toc485492852)

[List of terms: 17](#_Toc485492853)

[Status: 17](#_Toc485492854)

[CONTACTS (Contacts specific to the instance) 17](#_Toc485492855)

[COMPONENTS (These are the attached sensors) 19](#_Toc485492856)

[POSITION 20](#_Toc485492857)

[TYPEOF 22](#_Toc485492858)

[HISTORY 23](#_Toc485492859)

[SENSOR MODELS 24](#_Toc485492860)

[IDENTIFIERS 24](#_Toc485492861)

[List of terms: 25](#_Toc485492862)

[Minimum terms: 25](#_Toc485492863)

[Status: 25](#_Toc485492864)

[CLASSIFICATION 25](#_Toc485492865)

[List of terms: 26](#_Toc485492866)

[Candidate terms: 26](#_Toc485492867)

[Status: 26](#_Toc485492868)

[CAPABILITIES 26](#_Toc485492869)

[List of terms: 27](#_Toc485492870)

[Any of the following: 27](#_Toc485492871)

[Status: 27](#_Toc485492872)

[CHARACTERISTICS 27](#_Toc485492873)

[List of terms: 28](#_Toc485492874)

[Possible terms: 28](#_Toc485492875)

[Status: 28](#_Toc485492876)

[Contacts 28](#_Toc485492877)

[Documentation 30](#_Toc485492878)

[OUTPUTS (Outputs in the model, are inherited to the instance) 31](#_Toc485492879)

[SENSOR INSTANCES 33](#_Toc485492880)

[IDENTIFIERS 33](#_Toc485492881)

[List of terms: 33](#_Toc485492882)

[Mandatory terms: 33](#_Toc485492883)

[Status: 33](#_Toc485492884)

[KEYWORDS (Keywords can include the sensor outputs from P01) 34](#_Toc485492885)

[CAPABILITIES (if additional from the model add here. if different add them in the output) 34](#_Toc485492886)

[CHARACTERISTICS (Additional characteristics diff from model) 35](#_Toc485492887)

[List of terms: 36](#_Toc485492888)

[Status: 36](#_Toc485492889)

[CONTACTS (Additional contacts specific to the instance) 36](#_Toc485492890)

[POSITION (only relative position to the platform) 38](#_Toc485492891)

[TYPEOF 39](#_Toc485492892)

[ATTACHEDTO 40](#_Toc485492893)

[HISTORY 40](#_Toc485492894)

# Common SensorML profiles

“In order to achieve interoperability within and between various sensor communities, implementation of SensorML will require the definition of community specific semantics (within online dictionaries or ontologies) that can be utilized within the framework” [1].

Task 3.21 deals with the implementation of these profiles, by dealing with the following issues in SensorML:

* The coding standard itself
* The list of terms each section includes
* The list of values each term can accept
* The controlled vocabularies for the terms and values.

The current report is in sync with the SWE Marine profiles group, which is formulating the common SensorML profiles across the world. The following profiles will form the basis for the SWE Marine group work as they include the decisions taken from the group’s meetings as well.

## SWE Marine Profiles Group

To avoid interoperability issues in OGC SWE implementations by different organizations and users, an agreement was needed on how to apply SWE concepts and how to use vocabularies in a common way that would be shared by different projects, implementations, and users.

SWE Marine Profiles group, was created as a solution to the above mentioned need, by partners from several projects and initiatives (AODN, BRIDGES, ENVRI+, EUROFLEETS /EUROFLEETS2, FixO3, FRAM, IOOS, Jerico/Jerico-Next, NeXOS, ODIP/ODIP II, RITMARE, SeaDataNet, SenseOcean, X-DOMES) who joined forces to develop common marine profiles of OGC SWE standards that can be used in multiple projects and organizations. [2]

SWE Marine Profile members interact and communicate through the use of a mailing list and a wiki website. The wiki helps to collect and discuss different approaches to how OGC Sensor Web Enablement (SWE) standards (Sensor Observation Service (SOS), Observations and Measurements (O&M) and SensorML are used in different projects and systems. It is currently structured in the following subsections, which can be edited by its members after logging in:

• SweExamples: Examples of SensorML, O&M and SOS usage

• SweVocabularies: Vocabularies for the Marine SWE Profiles

• SweProfile: Structure and proposed content of the Marine SWE Profiles

• SosInventory: Inventory of SOS Servers

A while ago the group published several vocabularies that cover six SensorML sections, namely the History, Capabilities, Characteristics, Classification, Identification and Contacts [3].

## Overview

This document describes platforms and sensors and distinguished them in models and instances. A model is an intangible entity that specifies some characteristics of a group of similar, usually mass-produced products, in the sense of a prototype. An instance is a particular serial number of a model. Through extension and inheritance, we need to only provide minimal instance-specific information about a particular deployed sensor/platform, while retaining a link back to a much more robust manufacturer's description. The information that is common to all sensors of this model is found by following the link in the typeOf element.

## PLATFORM MODELS

### IDENTIFIERS

#### Code style

<sml:identification>

< sml:IdentifierList>

< sml:identifier>

< sml:Term definition="http://vocab.nerc.ac.uk/collection/W07/current/IDEN0012/">

< sml:label>Manufacturer</label>

< sml:value>http://vocab.nerc.ac.uk/collection/L35/current/MAN0007/</ sml:value>

</Term>

</ sml:identifier>

< /sml:IdentifierList>

< /sml:identification>

#### Vocabularies

|  |  |  |
| --- | --- | --- |
| List of terms: | Minimum terms: | Status: |
| [W07](http://vocab.nerc.ac.uk/collection/W07/current/) | |  |  |  | | --- | --- | --- | |  | [Model name](http://vocab.nerc.ac.uk/collection/W07/current/IDEN0003/)  [Model number](http://vocab.nerc.ac.uk/collection/W07/current/IDEN0004/)  [Manufacturer](http://vocab.nerc.ac.uk/collection/W07/current/IDEN0012/)  [UUID](http://vocab.nerc.ac.uk/collection/W07/current/IDEN0007/)  [Unique ID](http://vocab.nerc.ac.uk/collection/W07/current/IDEN0008/)   |  | | --- | |  | | | Mandatory |

### CLASSIFICATION

#### Code style

<sml:classification>

<sml:ClassifierList>

<sml:classifier>

<sml:Term definition="http://vocab.nerc.ac.uk/collection/W06/current/CLSS0002/">

<sml:label>Instrument Type</ sml:label> <sml:value>http://vocab.nerc.ac.uk/collection/L05/current/351/</sml:value>

</sml:Term>

</sml:classifier>

</sml:ClassifierList>

</sml:classification>

#### Vocabularies

|  |  |  |
| --- | --- | --- |
| List of terms: | Candidate terms: | Status: |
| [W06](http://vocab.nerc.ac.uk/collection/W06/current/) | |  |  |  | | --- | --- | --- | |  | * [Platform type](http://vocab.nerc.ac.uk/collection/W06/current/CLSS0001/) * Application Domain  |  | | --- | |  | | | Mandatory |

### CAPABILITIES

#### Code style

<?xml version="1.0"?>

<sml:capabilities name="MeasurementCapapbilities">

<sml:CapabilityList>

<sml:capability name="Operating depth">

<sml:QuantityRange definition=" http://vocab.nerc.ac.uk/collection/W04/current/CAPB0012/">

<sml:label> Operating depth</label>

<sml:uom href=" http://vocab.nerc.ac.uk/collection/P06/current/ULAA/"/>

<sml:value>10 1000</value>

</sml:QuantityRange>

</sml:capability>

<sml:capability name="SurvivalDepth">

<sml:Quantity definition=" http://vocab.nerc.ac.uk/collection/W04/current/CAPB0013/">

<sml:label>Survival Depth</label>

<sml:uom href=" http://vocab.nerc.ac.uk/collection/P06/current/ULAA/"/>

<sml:value>1000</value>

</sml:Quantity>

</sml:capability>

</sml:CapabilityList>

</sml:capabilities>

#### Vocabularies

|  |  |  |
| --- | --- | --- |
| List of terms: | Mandatory terms: | Status: |
| [W04](http://vocab.nerc.ac.uk/collection/W04/current/) | |  | | --- | | * [Operating Depth](http://vocab.nerc.ac.uk/collection/W04/current/CAPB0012/) * [Survival Depth](http://vocab.nerc.ac.uk/collection/W04/current/CAPB0013/) * [Resolution](http://vocab.nerc.ac.uk/collection/W04/current/CAPB0007/) * Sampling Rate | | Mandatory |

### CHARACTERISTICS

#### Code style

<sml:characteristics name="PhysicalCharacteristics">

<sml:CharacteristicList>

<sml:characteristic name="Weight">

<sml:Quantity definition="http://vocab.nerc.ac.uk/collection/W05/current/CHAR0001/">

<sml:label>Weight</ sml:label>

<sml:uom href="http://vocab.nerc.ac.uk/collection/P06/current/UGKG/"/>

<sml:value>160</value>

</sml:Quantity>

</sml:characteristic>

<sml:characteristic name="Length">

<sml:QuantityRange definition="http://vocab.nerc.ac.uk/collection/W05/current/CHAR0002/">

<sml:label>Length</ sml:label>

<sml:uom href="http://vocab.nerc.ac.uk/collection/P06/current/UXMM/"/>

<sml:value>193 273</value>

</sml:QuantityRange>

</sml:characteristic>

</sml:CharacteristicList>

</sml:characteristics>

#### Vocabularies

|  |  |  |
| --- | --- | --- |
| List of terms: | Possible terms: | Status: |
| [W05](http://vocab.nerc.ac.uk/collection/W05/current/) | [Width](http://vocab.nerc.ac.uk/collection/W05/current/CHAR0004/)  [Height](http://vocab.nerc.ac.uk/collection/W05/current/CHAR0003/)  [Weight](http://vocab.nerc.ac.uk/collection/W05/current/CHAR0001/)  [Length](http://vocab.nerc.ac.uk/collection/W05/current/CHAR0002/)  Material  [Data Storage](http://vocab.nerc.ac.uk/collection/W05/current/CHAR0006/) | Optional |

### Contacts

#### Code style

<sml:contacts>

<sml:ContactList>

< sml:contact arcrole="http://vocab.nerc.ac.uk/collection/G04/current/001/">

<gmd:CI\_ResponsibleParty>

< gmd:contactInfo>

< gmd::CI\_Contact>

< gmd:phone>

< gmd:CI\_Telephone>

< gmd:voice>

<gco:CharacterString>+449898989</gco:CharacterString>

</ gmd:voice>

</ gmd:CI\_Telephone>

</ gmd:phone>

< gmd:address>

< gmd:CI\_Address>

< gmd:deliveryPoint>

<gco:CharacterString>xx YYYYYY street</gco:CharacterString>

</gmd:deliveryPoint>

<gmd:city>

<gmd:CharacterString>UKPT0811</gmd:CharacterString>

</gmd:city>

<gmd:postalCode>

<gco:CharacterString>L3 2BD</gco:CharacterString>

</gmd:postalCode>

</gmd:CI\_Address>

</gmd:address>

</gmd:CI\_Contact>

</gmd:contactInfo>

<gmd:role gco:nilReason="inapplicable"/>

</CI\_ResponsibleParty>

</contact>

<sml:contact

xlink:arcrole=" http://vocab.nerc.ac.uk/collection/G04/current/010/"

xlink:href="http://www.myCompany.com/contact/company.xml"/>

</sml:ContactList>

</sml:contacts>

#### Vocabularies

|  |  |
| --- | --- |
| List of terms for roles from [G04](http://vocab.nerc.ac.uk/collection/G04/current/): | Status: |
|  | Optional |

### Documentation

#### Code style

<?xml version="1.0"?>

<documentation>

<DocumentList>

<document arcrole="http://sensorml.com/ont/swe/property/OperationsManual">

<CI\_OnlineResource>

<linkage>

<URL>http://www.aanderaa.com/media/pdfs/oxygen-optode-4531.pdf</URL>

</linkage>

<name> <CharacterString>Aanderaa 4531 oxygen optode OperationsManual</CharacterString></name>

<description><CharacterString>Aanderaa 4531 oxygen optode OperationsManual</CharacterString></description>

</CI\_OnlineResource>

</document>

</DocumentList>

</documentation>

|  |
| --- |
| Status: |
| Optional |

## PLATFORM INSTANCES

### IDENTIFIERS

#### Code style

<identification>

<IdentifierList>

<identifier>

<Term definition="http://vocab.nerc.ac.uk/collection/W07/current/IDEN0009/">

<label>WMO platform number</label>

<value>XXXXXXX</value>

</Term>

</identifier>

<IdentifierList>

<identification>

#### Vocabularies

|  |  |  |
| --- | --- | --- |
| **List of terms:** | **Mandatory terms:** | **Status:** |
| [W07](http://vocab.nerc.ac.uk/collection/W07/current/) | * [**ICES CODE**](http://vocab.nerc.ac.uk/collection/W07/current/IDEN0001/) * [**CALLSIGN**](http://vocab.nerc.ac.uk/collection/W07/current/IDEN0010/) * [WMO **PLATFORM NUMBER**](http://vocab.nerc.ac.uk/collection/W07/current/IDEN0009/) * [**Unique ID**](http://vocab.nerc.ac.uk/collection/W07/current/IDEN0008/) * [**Serial number**](http://vocab.nerc.ac.uk/collection/W07/current/IDEN0005/) * [**UUID**](http://vocab.nerc.ac.uk/collection/W07/current/IDEN0007/) * [**Long Name**](http://vocab.nerc.ac.uk/collection/W07/current/IDEN0002/) * [**Short Name**](http://vocab.nerc.ac.uk/collection/W07/current/IDEN0006/) | Mandatory |

### KEYWORDS

#### Code style

<keywords>

<KeywordList>

<keyword>SenseOcean</keyword>

<keyword>BODC</keyword>

<keyword>NOC</keyword>

</KeywordList>

</keywords>

### CAPABILITIES (if additional from the model add here. if different add them in the output)

#### Code style

<?xml version="1.0"?>

<capabilities name="MeasurementCapapbilityTEMPPR01">

<CapabilityList>

<capability name="Latency">

<QuantityRange definition="http://vocab.nerc.ac.uk/collection/W04/current/CAPB0004/">

<label>Latency</label>

<uom href="http://vocab.nerc.ac.uk/collection/P06/current/UTBB/"/>

<value>0 1</value>

</QuantityRange>

</capability>

<capability name="Frequency">

<Quantity definition="http://vocab.nerc.ac.uk/collection/W04/current/CAPB0003/">

<label>Frequency</label>

<uom href="http://vocab.nerc.ac.uk/collection/P06/current/UTHZ/"/>

<value>1</value>

</Quantity>

</capability>

</CapabilityList>

</capabilities>

|  |  |
| --- | --- |
| List of terms: | Status: |
| [W04](http://vocab.nerc.ac.uk/collection/W04/current/) | Optional |

### CHARACTERISTICS (Additional characteristics diff from model)

#### Code style

<characteristics name="PhysicalCharacteristics">

<CharacteristicList>

<characteristic name="Weight">

<Quantity definition="http://vocab.nerc.ac.uk/collection/W05/current/CHAR0001/">

<label>Weight</label>

<uom href="http://vocab.nerc.ac.uk/collection/P06/current/UGKG/"/>

<value>160</value>

</Quantity>

</characteristic>

<characteristic name="Length">

<QuantityRange definition="http://vocab.nerc.ac.uk/collection/W05/current/CHAR0002/">

<label>Length</label>

<uom href="http://vocab.nerc.ac.uk/collection/P06/current/UXMM/"/>

<value>193 273</value>

</QuantityRange>

</characteristic>

</CharacteristicList>

</characteristics>

#### Vocabularies

|  |  |
| --- | --- |
| List of terms: | Status: |
| [W05](http://vocab.nerc.ac.uk/collection/W05/current/) | Optional |

### CONTACTS (Contacts specific to the instance)

#### Code style

<sml:contacts>

<sml:ContactList>

< sml:contact arcrole="http://vocab.nerc.ac.uk/collection/G04/current/CONT0001/">

<gmd:CI\_ResponsibleParty>

< gmd:contactInfo>

< gmd::CI\_Contact>

< gmd:phone>

< gmd:CI\_Telephone>

< gmd:voice>

<gco:CharacterString>+449898989</gco:CharacterString>

</ gmd:voice>

</ gmd:CI\_Telephone>

</ gmd:phone>

< gmd:address>

< gmd:CI\_Address>

< gmd:deliveryPoint>

<gco:CharacterString>17 STANDISH STREET</gco:CharacterString>

</gmd:deliveryPoint>

<gmd:city>

<gmd:CharacterString>UKPT0811</gmd:CharacterString>

</gmd:city>

<gmd:postalCode>

<gco:CharacterString>L3 2BD</gco:CharacterString>

</gmd:postalCode>

</gmd:CI\_Address>

</gmd:address>

</gmd:CI\_Contact>

</gmd:contactInfo>

<gmd:role gco:nilReason="inapplicable"/>

</CI\_ResponsibleParty>

</contact>

<sml:contact

xlink:arcrole=" http://vocab.nerc.ac.uk/collection/W08/current/CONT0001/"

xlink:href="http://www.myCompany.com/contact/company.xml"/>

</sml:ContactList>

</sml:contacts>

#### Vocabularies

|  |  |  |
| --- | --- | --- |
| List of terms | Status: | |
| G04 | | Mandatory |

### COMPONENTS (These are the attached sensors)

#### Code style

<?xml version="1.0"?>

<components>

<ComponentList>

<component href="http://linkedsystems.uk/system/instance/TOOL0969\_1234/"/>

<component href="http://linkedsystems.uk/system/instance/TOOLYSI\_89325698/"/>

<component href="http://linkedsystems.uk/system/instance/TOOLYSI\_1234/"/>

<component href="http://linkedsystems.uk/system/instance/TOOL0969\_55555/"/>

<component href="http://linkedsystems.uk/system/instance/TOOL0969\_9898989/"/>

<component href="http://linkedsystems.uk/system/instance/TOOLYSI\_789-654-123/"/>

</ComponentList>

</components>

#### Status: Optional

### POSITION

#### Code style

##### By location:

A static location can also be provided using a swe:Vector

<position>

<Vector referenceFrame="http://www.opengis.net/def/crs/EPSG/6.7/4326"

<coordinate name="latitude">

<Quantity definition="http://vocab.nerc.ac.uk/collection/P07/current/CFSN0600/" axisID="latitude">

<uom href="http://vocab.nerc.ac.uk/collection/P06/current/UAAA/"/>

<value>2.3</value>

</Quantity>

</coordinate>

<coordinate name="longitude">

<Quantity definition="http://vocab.nerc.ac.uk/collection/P07/current/CFSN0554/" axisID="longitude">

<uom href="http://vocab.nerc.ac.uk/collection/P06/current/UAAA/"/>

<value>47.8</value>

</Quantity>

</coordinate>

</Vector>

</position>

##### By point:

Position by point supports a static location using the gml:Point element. It is not appropriate if the orientation of the component is relevant or the component is has a dynamic location.

<sml:position>

<!-- EPSG 4326 is for latitude-longitude, in that order -->

<gml:Point gml:id="stationLocation" srsName="http://www.opengis.net/def/crs/EPSG/0/4326">

<gml:coordinates>47.8 88.56</gml:coordinates>

</gml:Point>

</sml:position>

##### Trajectory

Status: Mandatory (but depends if you model position or outputs)

* Suggestions are: to refer to the data to get the position
* To add a bounding box (To be added soon)
* To list the values of the trajectory vs time (for fast moving ones, this can get very long)

<sml:position>

<swe:DataArray definition="Suggestion to create a new vocabulary for geographical spatial co-ordinate category">

<swe:elementCount>

<swe:Count>

<swe:value>10</swe:value>

</swe:Count>

</swe:elementCount>

<swe:elementType name="trajectory">

<swe:DataRecord definition="Suggestion to create a new vocabulary for geographical spatial co-ordinate category">

<swe:field name="samplingTime">

<swe:Time definition="To be added in the ">

<swe:label>Sampling Time</swe:label>

<swe:uom xlink:href="<http://www.opengis.net/def/uom/ISO-8601/0/Gregorian>"/>

</swe:Time>

</swe:field>

<swe:field name="location">

<swe:Vector definition="<http://sensorml.com/ont/swe/property/location>" referenceFrame="<http://www.opengis.net/def/crs/EPSG/6.7/4326>"

localFrame="#SENSOR\_CRS">

<swe:label>Platform Location</swe:label>

<swe:coordinate name="Lat">

<swe:Quantity definition="[http://vocab.nerc.ac.uk/collection/P01/current/ALATZZ01](http://vocab.nerc.ac.uk/collection/P01/current/ALONZZ01/)/"

axisID="Lat">

<swe:uom code="deg"/>

</swe:Quantity>

</swe:coordinate>

<swe:coordinate name="Lon">

<swe:Quantity definition="<http://vocab.nerc.ac.uk/collection/P01/current/ALONZZ01/>"

axisID="Long">

<swe:uom code="deg"/>

</swe:Quantity>

</swe:coordinate>

</swe:Vector>

</swe:field>

</swe:DataRecord>

</swe:elementType>

<swe:encoding>

<swe:TextEncoding blockSeparator=" " tokenSeparator=","/>

</swe:encoding>

<swe:values>

2011-03-01T04:20:00Z,25.72,-61.75

2011-03-14T13:10:00Z,25.49,-61.70

2011-03-21T18:43:00Z,25.35,-61.63

2011-03-30T05:13:00Z,24.87,-61.43

2011-04-08T01:45:00Z,24.86,-61.42

2011-04-12T08:34:00Z,24.32,-61.67

2011-04-15T09:12:00Z,24.54,-61.53

2011-04-21T03:21:00Z,24.53,-61.68

2011-04-27T04:34:00Z,24.32,-61.76

2011-05-01T12:01:00Z,24.28,-61.56

</swe:values>

</swe:DataArray>

</sml:position>

### TYPEOF

#### Code style

<sml:typeOf xlink:title="National\_Oceanography\_Centre\_waveglider\_General\_platform\_category" xlink:href="http://linkedsystems.uk/system/prototype/PL898/"/>

### HISTORY

#### Code style

<sml:history>

<sml:EventList>

<sml:event href="http://vocab.nerc.ac.uk/collection/W03/current/W030002/">

<sml:Event>

<swe:label>Deployment</swe:label>

<swe:description>A deployment </swe:description>

<sml:time>

<gml:TimeInstant id="D07072016">

<gml :timePosition>2016-07-07T00:00:00Z</gml :timePosition>

</gml :TimeInstant>

</sml:time>

</sml:Event>

</sml:event>

<sml:event href="http://vocab.nerc.ac.uk/collection/W03/current/W030012/">

<sml :Event>

<swe:label>Decommissioning</swe :label>

<swe:description>A decommissioning </swe:description>

<sml:documentation>

<sml:DocumentList>

<sml:document>

<gmd:CI\_OnlineResource>

<gmd:linkage>

<gmd:URL>http://document819path</gmd:URL>

</gmd:linkage>

</gmd:CI\_OnlineResource>

</ sml:document>

</ sml:DocumentList>

</sml:documentation>

<sml:time>

< gml:TimeInstant id="D02082016">

< gml:timePosition>2016-08-02T00:00:00Z</ gml:timePosition>

</gml:TimeInstant>

</sml:time>

</sml:Event>

</ sml:event>

< /sml:EventList>

</sml:history>

|  |  |
| --- | --- |
| List of terms: | Status: |
| [http://vocab.nerc.ac.uk/collection/W03/current/](http://vocab.nerc.ac.uk/collection/G04/current/) | Mandatory |

## SENSOR MODELS

### IDENTIFIERS

#### Code style

<sml:identification>

< sml:IdentifierList>

< sml:identifier>

< sml:Term definition="http://vocab.nerc.ac.uk/collection/W07/current/IDEN0012/">

< sml:label>Manufacturer</label>

< sml:value>http://vocab.nerc.ac.uk/collection/L35/current/MAN0007/</ sml:value>

</Term>

</ sml:identifier>

< /sml:IdentifierList>

< /sml:identification>

#### Vocabularies

|  |  |  |
| --- | --- | --- |
| List of terms: | Minimum terms: | Status: |
| [W07](http://vocab.nerc.ac.uk/collection/W07/current/) | |  |  |  | | --- | --- | --- | |  | [Model name](http://vocab.nerc.ac.uk/collection/W07/current/IDEN0003/) -  [Model number](http://vocab.nerc.ac.uk/collection/W07/current/IDEN0004/) -  [Manufacturer](http://vocab.nerc.ac.uk/collection/W07/current/IDEN0012/)  [UUID](http://vocab.nerc.ac.uk/collection/W07/current/IDEN0007/)  Or  [Unique ID](http://vocab.nerc.ac.uk/collection/W07/current/IDEN0008/)   |  | | --- | |  | | | Mandatory |

### CLASSIFICATION

#### Code style

<sml:classification>

<sml:ClassifierList>

<sml:classifier>

<sml:Term definition="http://vocab.nerc.ac.uk/collection/W06/current/CLSS0002/">

<sml:label>Instrument Type</ sml:label>

<sml:value>http://vocab.nerc.ac.uk/collection/L05/current/351/</sml:value>

</sml:Term>

</sml:classifier>

</sml:ClassifierList>

</sml:classification>

#### Vocabularies

|  |  |  |
| --- | --- | --- |
| List of terms: | Candidate terms: | Status: |
| [W06](http://vocab.nerc.ac.uk/collection/W06/current/) | * [Instrument type](http://vocab.nerc.ac.uk/collection/W06/current/CLSS0002/)- * Application Domain | Mandatory |

### CAPABILITIES

#### Code style

<?xml version="1.0"?>

<sml:capabilities name="MeasurementCapapbilities">

<sml:CapabilityList>

<sml:capability name="Operating depth">

<sml:QuantityRange definition=" http://vocab.nerc.ac.uk/collection/W04/current/CAPB0012/">

<sml:label> Operating depth</label>

<sml:uom href=" http://vocab.nerc.ac.uk/collection/P06/current/ULAA/"/>

<sml:value>10 1000</value>

</sml:QuantityRange>

</sml:capability>

<sml:capability name="SurvivalDepth">

<sml:Quantity definition=" http://vocab.nerc.ac.uk/collection/W04/current/CAPB0013/">

<sml:label>Survival Depth</label>

<sml:uom href=" http://vocab.nerc.ac.uk/collection/P06/current/ULAA/"/>

<sml:value>1000</value>

</sml:Quantity>

</sml:capability>

</sml:CapabilityList>

</sml:capabilities>

#### Vocabularies

|  |  |  |
| --- | --- | --- |
| List of terms: | Any of the following: | Status: |
| [W04](http://vocab.nerc.ac.uk/collection/W06/current/) | |  | | --- | | [Resolution](http://vocab.nerc.ac.uk/collection/W04/current/CAPB0007/)  **Sampling Rate** –  Sensitivity  Selectivity -  [Selectivity](http://vocab.nerc.ac.uk/collection/W04/current/CAPB0010/)  [Accuracy](http://vocab.nerc.ac.uk/collection/W04/current/CAPB0001/)  [Frequency](http://vocab.nerc.ac.uk/collection/W04/current/CAPB0003)  [Latency](http://vocab.nerc.ac.uk/collection/W04/current/CAPB0004/) | | Mandatory |

### CHARACTERISTICS

#### Code style

<sml:characteristics name="PhysicalCharacteristics">

<sml:CharacteristicList>

<sml:characteristic name="Weight">

<sml:Quantity definition="http://vocab.nerc.ac.uk/collection/W05/current/CHAR0001/">

<sml:label>Weight</ sml:label>

<sml:uom href="http://vocab.nerc.ac.uk/collection/P06/current/UGKG/"/>

<sml:value>160</value>

</sml:Quantity>

</sml:characteristic>

<sml:characteristic name="Length">

<sml:QuantityRange definition="http://vocab.nerc.ac.uk/collection/W05/current/CHAR0002/">

<sml:label>Length</ sml:label>

<sml:uom href="http://vocab.nerc.ac.uk/collection/P06/current/UXMM/"/>

<sml:value>193 273</value>

</sml:QuantityRange>

</sml:characteristic>

</sml:CharacteristicList>

</sml:characteristics>

#### Vocabularies

|  |  |  |
| --- | --- | --- |
| List of terms: | Possible terms: | Status: |
| W05 | [Width](http://vocab.nerc.ac.uk/collection/W05/current/CHAR0004/)  [Height](http://vocab.nerc.ac.uk/collection/W05/current/CHAR0003/)  [Weight](http://vocab.nerc.ac.uk/collection/W05/current/CHAR0001/)  [Lenght](http://vocab.nerc.ac.uk/collection/W05/current/CHAR0002/)  Material  [Data Storage](http://vocab.nerc.ac.uk/collection/W05/current/CHAR0006/) | Optional |

### Contacts

#### Code style

<sml:contacts>

<sml:ContactList>

< sml:contact arcrole="http://vocab.nerc.ac.uk/collection/G04/current/001/">

<gmd:CI\_ResponsibleParty>

< gmd:contactInfo>

< gmd::CI\_Contact>

< gmd:phone>

< gmd:CI\_Telephone>

< gmd:voice>

<gco:CharacterString>+449898989</gco:CharacterString>

</ gmd:voice>

</ gmd:CI\_Telephone>

</ gmd:phone>

< gmd:address>

< gmd:CI\_Address>

< gmd:deliveryPoint>

<gco:CharacterString>17 STANDISH STREET</gco:CharacterString>

</gmd:deliveryPoint>

<gmd:city>

<gmd:CharacterString>UKPT0811</gmd:CharacterString>

</gmd:city>

<gmd:postalCode>

<gco:CharacterString>L3 2BD</gco:CharacterString>

</gmd:postalCode>

</gmd:CI\_Address>

</gmd:address>

</gmd:CI\_Contact>

</gmd:contactInfo>

<gmd:role gco:nilReason="inapplicable"/>

</CI\_ResponsibleParty>

</contact>

<sml:contact

xlink:arcrole=" http://vocab.nerc.ac.uk/collection/G04/current/010/"

xlink:href="http://www.myCompany.com/contact/company.xml"/>

</sml:ContactList>

</sml:contacts>

#### Vocabularies

|  |  |
| --- | --- |
| List of terms from G04 for roles: | Status: |
| <http://vocab.nerc.ac.uk/collection/G04/current/> | Optional |

### Documentation

#### Code style

<?xml version="1.0"?>

<documentation>

<DocumentList>

<document arcrole="http://sensorml.com/ont/swe/property/OperationsManual">

<CI\_OnlineResource>

<linkage>

<URL>http://www.aanderaa.com/media/pdfs/oxygen-optode-4531.pdf</URL>

</linkage>

<name> <CharacterString>Aanderaa 4531 oxygen optode OperationsManual</CharacterString></name>

<description><CharacterString>Aanderaa 4531 oxygen optode OperationsManual</CharacterString></description>

</CI\_OnlineResource>

</document>

</DocumentList>

</documentation>

|  |
| --- |
| Status: |
| Optional |

### OUTPUTS (Outputs in the model, are inherited to the instance)

#### Code style

<sml:outputs>

<sml:OutputList>

<sml:output name="O2Sat\_2">

<swe:Quantity definition="http://vocab.nerc.ac.uk/collection/P01/current/OXYSZZ02/">

<swe:uom code="UCUMCODE" xlink:href="http://vocab.nerc.ac.uk/collection/P06/current/UPCT"/>

</swe:Quantity>

</sml:output>

<sml:output name="Latency">

<swe:Quantity definition="http://vocab.nerc.ac.uk/collection/W04/current/CAPB0004/">

<swe:uom code="UCUMCODE" xlink:href="http://vocab.nerc.ac.uk/collection/P06/current/UTBB"/>

<swe:value>1</swe:value>

</swe:Quantity>

</sml:output>

<sml:output name="Sample volume">

<swe:QuantityRange definition="N/A">

<swe:uom code="UCUMCODE" xlink:href="http://vocab.nerc.ac.uk/collection/P06/current/"/>

</swe:QuantityRange>

</sml:output>

<sml:output name="Temp">

<swe:Quantity definition="http://vocab.nerc.ac.uk/collection/P01/current/TEMPPR01/">

<swe:uom code="UCUMCODE" xlink:href="http://vocab.nerc.ac.uk/collection/P06/current/UPAA"/>

</swe:Quantity>

</sml:output>

<sml:output name="WC\_dissO2\_uncalib\_2">

<swe:Quantity definition="http://vocab.nerc.ac.uk/collection/P01/current/DOXYUZ02/">

<swe:uom code="UCUMCODE" xlink:href="http://vocab.nerc.ac.uk/collection/P06/current/UPOX"/>

</swe:Quantity>

</sml:output>

</sml:OutputList>

</sml:outputs>

## SENSOR INSTANCES

### IDENTIFIERS

#### Code style

<identification>

<IdentifierList>

<identifier>

<Term definition="http://vocab.nerc.ac.uk/collection/W07/current/IDEN0009/">

<label>UUID</label>

<value>XXXXXXX</value>

</Term>

</identifier>

<IdentifierList>

<identification>

#### Vocabularies

|  |  |  |
| --- | --- | --- |
| List of terms: | Mandatory terms: | Status: |
| W07 | |  |  | | --- | --- | |  | [Unique ID](http://vocab.nerc.ac.uk/collection/W07/current/IDEN0008/),  [Serial Number](http://vocab.nerc.ac.uk/collection/W07/current/IDEN0005/),  [UUID](http://vocab.nerc.ac.uk/collection/W07/current/IDEN0007/)  [LongName](http://vocab.nerc.ac.uk/collection/W07/current/IDEN0002/)  [ShortName](http://vocab.nerc.ac.uk/collection/W07/current/IDEN0006/) | | Mandatory |

### KEYWORDS (Keywords can include the sensor outputs from P01)

#### Code style

<keywords>

<KeywordList>

<keyword> http://vocab.nerc.ac.uk/collection/P01/current/TEMPPR01/"></keyword>

<keyword> http://vocab.nerc.ac.uk/collection/P01/current/OXYSZZ02/">"></keyword>

<keyword> http://vocab.nerc.ac.uk/collection/P01/current/TEMPPR01/"></keyword>

</KeywordList>

</keywords>

### CAPABILITIES (if additional from the model add here. if different add them in the output)

#### Code style

<?xml version="1.0"?>

<capabilities name="MeasurementCapapbilityTEMPPR01">

<CapabilityList>

<capability name="Latency">

<QuantityRange definition="http://vocab.nerc.ac.uk/collection/W04/current/CAPB0004/">

<label>Latency</label>

<uom href="http://vocab.nerc.ac.uk/collection/P06/current/UTBB/"/>

<value>0 1</value>

</QuantityRange>

</capability>

<capability name="Frequency">

<Quantity definition="http://vocab.nerc.ac.uk/collection/W04/current/CAPB0003/">

<label>Frequency</label>

<uom href="http://vocab.nerc.ac.uk/collection/P06/current/UTHZ/"/>

<value>1</value>

</Quantity>

</capability>

</CapabilityList>

</capabilities>

#### Vocabularies

|  |  |
| --- | --- |
| List of terms: | Status: |
| W06 | Optional |

### CHARACTERISTICS (Additional characteristics diff from model)

#### Code style

<characteristics name="PhysicalCharacteristics">

<CharacteristicList>

<characteristic name="Weight">

<Quantity definition="http://vocab.nerc.ac.uk/collection/W05/current/CHAR0001/">

<label>Weight</label>

<uom href="http://vocab.nerc.ac.uk/collection/P06/current/UGKG/"/>

<value>160</value>

</Quantity>

</characteristic>

<characteristic name="Length">

<QuantityRange definition="http://vocab.nerc.ac.uk/collection/W05/current/CHAR0002/">

<label>Length</label>

<uom href="http://vocab.nerc.ac.uk/collection/P06/current/UXMM/"/>

<value>193 273</value>

</QuantityRange>

</characteristic>

</CharacteristicList>

</characteristics>

|  |  |
| --- | --- |
| List of terms: | Status: |
| W05 | Optional |

### CONTACTS (Additional contacts specific to the instance)

#### Code style

<sml:contacts>

<sml:ContactList>

< sml:contact arcrole="http://vocab.nerc.ac.uk/collection/G04/current/CONT0001/">

<gmd:CI\_ResponsibleParty>

< gmd:contactInfo>

< gmd::CI\_Contact>

< gmd:phone>

< gmd:CI\_Telephone>

< gmd:voice>

<gco:CharacterString>+449898989</gco:CharacterString>

</ gmd:voice>

</ gmd:CI\_Telephone>

</ gmd:phone>

< gmd:address>

< gmd:CI\_Address>

< gmd:deliveryPoint>

<gco:CharacterString>17 BlUMERG STREET</gco:CharacterString>

</gmd:deliveryPoint>

<gmd:city>

<gmd:CharacterString>UKPT0811</gmd:CharacterString>

</gmd:city>

<gmd:postalCode>

<gco:CharacterString>XXXXX</gco:CharacterString>

</gmd:postalCode>

</gmd:CI\_Address>

</gmd:address>

</gmd:CI\_Contact>

</gmd:contactInfo>

<gmd:role gco:nilReason="inapplicable"/>

</CI\_ResponsibleParty>

</contact>

<sml:contact

xlink:arcrole=" http://vocab.nerc.ac.uk/collection/W08/current/CONT0001/"

xlink:href="http://www.myCompany.com/contact/company.xml"/>

</sml:ContactList>

</sml:contacts>

|  |  |
| --- | --- |
| List of terms for the role: | Status: |
| G08 | Mandatory |

### POSITION (only relative position to the platform)

#### Code style

<sml:position>

<swe:Vector referenceFrame="EPSG::4326">

<swe:coordinate name="easting">

<swe:Quantity axisID="x">

<swe:uom code="degree"/>

<swe:value>00.0000000</swe:value>

</swe:Quantity>

</swe:coordinate>

<swe:coordinate name="northing">

<swe:Quantity axisID="y">

<swe:uom code="degree"/>

<swe:value>00.00000</swe:value>

</swe:Quantity>

</swe:coordinate>

<swe:coordinate name="altitude">

<swe:Quantity axisID="z">

<swe:uom code="m"/>

<swe:value>0</swe:value>

</swe:Quantity>

</swe:coordinate>

</swe:Vector>

</sml:position>

Vocabularies

|  |  |
| --- | --- |
| List of terms for the position: | Status: |
| New vocabulary | Optional |

### TYPEOF

#### Code style

<sml:typeOf xlink:title="AanderaaOxygenOptode" xlink:href="[http://linkedsystems.uk/system/prototype/TOOL0969/"/](http://linkedsystems.uk/system/prototype/TOOL0969/%22/)>

### ATTACHEDTO

#### Code style

<sml:attachedTo xlink:title="platform name" xlink:href="URI of the platform"/>

### HISTORY

#### Code style

<sml:outputs>

<sml:OutputList>

<sml:output name="O2Sat\_2">

<swe:Quantity definition="http://vocab.nerc.ac.uk/collection/P01/current/OXYSZZ02/">

<swe:uom code="UCUMCODE" xlink:href="http://vocab.nerc.ac.uk/collection/P06/current/UPCT"/>

</swe:Quantity>

</sml:output>

<sml:output name="Latency">

<swe:Quantity definition="http://vocab.nerc.ac.uk/collection/W04/current/CAPB0004/">

<swe:uom code="UCUMCODE" xlink:href="http://vocab.nerc.ac.uk/collection/P06/current/UTBB"/>

<swe:value>1</swe:value>

</swe:Quantity>

</sml:output>

<sml:output name="Sample volume">

<swe:QuantityRange definition="N/A">

<swe:uom code="UCUMCODE" xlink:href="http://vocab.nerc.ac.uk/collection/P06/current/"/>

</swe:QuantityRange>

</sml:output>

<sml:output name="Temp">

<swe:Quantity definition="http://vocab.nerc.ac.uk/collection/P01/current/TEMPPR01/">

<swe:uom code="UCUMCODE" xlink:href="http://vocab.nerc.ac.uk/collection/P06/current/UPAA"/>

</swe:Quantity>

</sml:output>

<sml:output name="WC\_dissO2\_uncalib\_2">

<swe:Quantity definition="http://vocab.nerc.ac.uk/collection/P01/current/DOXYUZ02/">

<swe:uom code="UCUMCODE" xlink:href="http://vocab.nerc.ac.uk/collection/P06/current/UPOX"/>

</swe:Quantity>

</sml:output>

</sml:OutputList>

</sml:outputs>

|  |  |
| --- | --- |
| List of terms: | Status: |
| W03 | Mandatory |

## REFERENCES

1. Portal.opengeospatial.org, 2016. [Online]. Available:http://portal.opengeospatial.org/files/?artifact\_id=21273. [Accessed: 31-Jul- 2016]
2. S. Jirka, "Marine Profiles for OGC Sensor Web Enablement Standard", in EGU General Assembly, Vienna, 2016, p. 14690
3. Kokkinaki, Alexandra et al. “Semantically enhancing SensorML with Controlled Vocabularies in the Marine Domain.” (2016).