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| Source(s) | Sang-Kyun Kim, [goldmunt@gmail.com](mailto:goldmunt@gmail.com) (Myongji University)  Min Hyuk Jeong, [jmh8900@gmail.com](mailto:jmh8900@gmail.com) (Myongji University)  Hoe Yong Jin, [skydesert6410@gmail.com](mailto:skydesert6410@gmail.com) (Myongji University) |
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| Abstract | This contribution illustrates the basic JSON schema structure for representing location related sensor capabilities in a standardized data format. The semantics and examples of the location related sensor capabilities are presented. |
| Purpose | To start discussion on purpose of the standard |
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# Introduction

This contribution illustrates the basic JSON schema structure for representing location related sensor capabilities in a standardized data format. The semantics and examples of the location-related sensor capabilities are presented.

# Data formats for location sensor capabilities

## Orientation sensor capability

### General

This sub-clause specifies a sensor capability of an orientation sensor.

### Syntax

|  |
| --- |
| "orientationSensorCapabilityData": {  "type": "object",  "properties": {  "sensorCapabilityBaseData" : {  "$ref": "#/definitions/sensorCapabilityBaseData"  },  "orientationRange": {  "type": "object",  "properties": {  "yawMin" : {  "type" : "number"  },  "yawMax" : {  "type" : "number"  },  "pitchMin" : {  "type" : "number"  },  "pitchMax" : {  "type" : "number"  },  "rollMin" : {  "type" : "number"  },  "rollMax" : {  "type" : "number"  },  }  }  }  }, |

### Semantics

Semantics of the orientationSensorCapability:

| Name | Definition |
| --- | --- |
| orientationSensorCapabilityData | Tool for describing an orientation sensor capability. |
| orientationRange | Defines the range from the local coordinate system according to the Yaw, Pitch, and Roll. |
| yawMin | Describes the minimum value that the orientation sensor can perceive for Yaw in the unit of degree. |
| yawMax | Describes the maximum value that the orientation sensor can perceive for Yaw in the unit of degree. |
| pitchMin | Describes the minimum value that the orientation sensor can perceive for Pitch in the unit of degree. |
| pitch mix | Describes the maximum value that the orientation sensor can perceive for Pitch in the unit of degree. |
| rollMin | Describes the minimum value that the orientation sensor can perceive for Roll in the unit of degree. |
| rollMax | Describes the maximum value that the orientation sensor can perceive for Roll in the unit of degree. |

### Examples

This example shows the description of an orientation sensing capability with the following semantics. The sensor has the maximum value shall be yawMax ="10.0", pitchMax ="30.0" and rollMax ="45.0", and the minimum value shall be yawMin ="-10.0", pitchMin ="-20.0" and rollMin ="-45.0" .

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| --- |
| {  "sensorCapabilityBaseData": {},  "orientationRange": {  "yawMin": -10.0,  "yawMax": 10.0,  "pitchMin": -20.0,  "pitchMax": 30.0,  "rollMin": -45.0,  "rollMax": 45.0  }  } |

## Position tracking sensor capability

### General

This sub-clause specifies the capability of a position sensor.

### Syntax

|  |
| --- |
| "*PositionTrackingSensorCapabilityData*": {  "type": "object",  "properties": {  "sensorCapabilityBaseData" : {  "$ref": "#/definitions/sensorCapabilityBaseData"  },  "range": {  "type": "object",  "properties": {  "xMinValue" : {  "type" : "number"  },  "xMaxValue" : {  "type" : "number"  },  "yMinValue" : {  "type" : "number"  },  "yMaxValue" : {  "type" : "number"  },  "zMinValue" : {  "type" : "number"  },  "zMaxValue" : {  "type" : "number"  },  }  }  }  }, |

### Semantics

Semantics of the positionSensorCapabilityData:

| *Name* | *Definition* |
| --- | --- |
| PositionSensorCapability Type | Tool for describing a position sensor capability. |
| range | Defines the range in a local coordinate system relative to the position of the sensor in the idle state according to the x-, y-, and z-axis. |
| xMinValue | Describes the minimum value that the position sensor can perceive along the x-axis in the unit of meter. |
| xMaxValue | Describes the maximum value that the position sensor can perceive along the x-axis in the unit of meter. |
| yMinValue | Describes the minimum value that the position sensor can perceive along the y-axis in the unit of meter. |
| yMaxValue | Describes the maximum value that the position sensor can perceive along the y-axis in the unit of meter. |
| zMinValue | Describes the minimum value that the position sensor can perceive along the z-axis in the unit of meter. |
| zMaxValue | Describes the maximum value that the position sensor can perceive along the z-axis in the unit of meter. |

### Examples

In this example, the sensor has the maximum value shall be xMaxValue="60.0", yMaxValue="50.0" and zMaxValue="50.0", and the minimum value shall be xMinValue="-20.0", yMinValue="-30.0" and zMaxValue="0.0".

|  |
| --- |
| {  "sensorCapabilityBaseData": {},  "range": {  "xMinValue": -20.0,  "xMaxValue": 60.0,  "yMinValue": -30.0,  "yMaxValue": 50.0,  "zMinValue": 0.0,  "zMaxValue": 50.0  }  } |

## Distance sensor

### General

This sub-clause specifies a sensor data type, which describes a distance.

### Syntax

|  |
| --- |
| "distanceSensorCapabilityData": {  "type": "object",  "properties": {  "sensorCapabilityBaseData" : {  "$ref": "#/definitions/sensorCapabilityBaseData"  },  "location" : {  "$ref": "#/definitions/float3DVectorType"  },  }, |

### Semantics

Semantics of the distanceSensorCapabilityData:

| *Name* | *Definition* |
| --- | --- |
| distanceSensorCapability Type | Tool for describing a distance sensor capability. |
| location | Describes the location of the device from the global coordinate system according to the x-, y-, and z-axis in the unit of the meter (m). |

### Examples

This example shows the description of a distance sensing capability with the following semantics. The sensed information is received at the location of (1.0, 2.0, 100.0).

|  |
| --- |
| {  “sensorCapabilityBaseData”: {},  “location”: [1.0, 5.0, 100.0]  } |

## Global position sensor

### General

This sub-clause specifies the capability of a global position sensor.

### Syntax

|  |
| --- |
| "globalPositionSensorCapabilityData": {  "type": "object",  "properties": {  "sensorCapabilityBaseData" : {  "$ref": "#/definitions/sensorCapabilityBaseData"  },  "crs" : {  "type": "string"  },  "latitudeOffset": {  "type": "number"  },  "longitudeOffset": {  "type": "number"  },  "maxOperatingTemp": {  "type": "number"  },  "minOperatingTemp": {  "type": "number"  }  },  }, |

### Semantics

Semantics of the GlobalPositionSensorCapabilityData:

| *Name* | *Definition* |
| --- | --- |
| GlobalPositionSensorCapabilityData | Tool for describing a GPS sensor capability. |
| crs | Specifies the URI of the coordinate reference system based on which the values of longitude, latitude, and altitude are given. |
| longitudeOffset | Describes the value added to a base value of longitude to get to a specific absolute value. |
| latitudeOffset | Describes the value added to a base value of latitude to get to a specific absolute value. |
| maxOperatingTemp | Describes a maximum operating temperature |
| minOperatingTemp | Describes a minimum operating temperature |

### Examples

This example shows the description of a global position sensor's sensing capability with the following semantics. The sensor has a maximum operating temperature of 90 degrees Celsius, a minimum operating temperature of -30 degrees Celsius.

|  |
| --- |
| {  "sensorCapabilityBaseData": {},  "crs": "urn:ogc:def:crs:EPSG::4326",  "maxOperatingTemp": 90,  "minOperatingTemp": -30  } |

## Altitude sensor

### General

This sub-clause specifies the capability of an altitude sensor.

### Syntax

|  |
| --- |
| "altitudeSensorCapabilityData": {  "type": "object",  "properties": {  "sensorCapabilityBaseData" : {  "$ref": "#/definitions/sensorCapabilityBaseData"  },  "crs": {  "type": "string"  }  },  }, |

### Semantics

Semantics of the altitudeSensorCapabilityData:

|  |  |
| --- | --- |
| Name | Definition |
| AltitudeSensorCapabilityData | Tool for describing an altitude sensor capability. |
| crs | Specifies the URI of the coordinate reference system based on which the values of altitude are given. |

### Examples

This example shows the description of an altitude sensing capability with the following semantics. The sensor uses "urn:ogc:def:crs:EPSG::4326 as crs.

|  |
| --- |
| {  "sensorCapabilityBaseData": {},  "crs": "urn:ogc:def:crs:EPSG::4326",  } |