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| Title | **Syntax and semantics of sensor capability base type** |
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| Abstract | This contribution illustrates the basic JSON schema structure for representing sensor capability base types and attributes in a standardized data format. The semantics and examples of the base types and attributes 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 sensor capability base types and attributes in a standardized data format. The semantics and examples of the base types and attributes are presented.

# Data formats for sensor capability base type

## Sensor capability base type

### General

This sub-clause specifies a sensor capability base type.

### Syntax

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| "sensorCapabilityBaseType": { "type": "object","properties": { "id": { "type": "string" } "sensorCapabilityBaseAttributes" : { "$ref": "#/definitions/sensorCapabilityBaseAttributesType" }, "accuracyType": { "type": "object", "properties": { "oneOf": [ "percentAccuracy": { "type": "number", "minimum": 0.0, "maximum": 1.0 }, "valueAccuracy": { "type": "number" } ] } } }},"sensorCapabilityBaseAttributesType": {"type": "object","properties": { "unit": { "$ref": "#/definitions/unitType" }, "maxValue": { "type": "number" }, "minValue": { "type": "number" }, "offset": { "type": "number" }, "numOfLevels": { "type": number" "minimum": 0 }, "sensitivity": { "type": "number" }, "snr": { "type": "number" },}} |

### Semantics

Semantics of the sensorCapabilityBaseType:

| Name | Definition |
| --- | --- |
| SensorCapabilityBaseType | SensorCapabilityBaseType provides a base type for a subset of types defined as part of the sensor device capability metadata types. |
| id | Unique identifier for identifying individual sensor capabilities. |
| sensorCapabilityBase Attributes | Describes a group of attributes for the sensor capabilities to its actual value in sensorCapabilityBaseAttributesType. |
| accuracyType | Describes the degree of closeness of a measured quantity. Either percentAccuracy or valueAccuracy is chosen. |
| percentAccuracy | Describes the degree of closeness of a measured quantity to its actual value in a relative way using a value ranging from 0 to 1.0. 0 means 0 % accuracy and value 1.0 means 100 % accuracy. |
| valueAccuracy | Describes the degree of closeness of a measured quantity to its actual value in an absolute value of a given unit. The possible range of error as (-value, +value) of given unit. |

Semantics of the sensorCapabilityBaseAttributesType:

| Name | Definition |
| --- | --- |
| unit | Specifies the unit of the sensed value as a reference to a term that shall be using the unitType. |
| maxValue | Describes the maximum value that the sensor can perceive. The terms will be different according to the individual sensor type. |
| minValue | Describes the minimum value that the sensor can perceive. The terms will be different according to the individual sensor type. |
| offset | Describes the number of value locations added to a base value to get to a specific absolute value. |
| numOfLevels | Describes the number of value levels that the sensor can perceive in between maximum and minimum value.EXAMPLE The value 5 means the sensor can perceive 5 steps from minValue to maxValue. |
| sensitivity | Describes the minimum magnitude of input signal required to produce a specified output signal in a given unit. |
| snr | Describes the ratio of signal power to the noise power corrupting the signal. |

### Examples

This example shows the description of a basic sensing capability with the following semantics. The sensor capability id is "CAP-011". The unit this sensor measures is in meters. "maxValue" is 1000 meters and "minValue" is 0 meters. Since "offset" is 0 and "numOfLevels" is 10, it can be measured in units of 10 meters. Since the "sensitivity" is 5, data is output when more than 5 meters is sensed. "percentAccuracy" is 0.99.

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| { "id" : "CAP-011""sensorCapabilityBaseAttributes": { "unit": "meter", "maxValue": 1000, "minValue": 0, "offset": 0, "numOfLevels": 10, "sensitivity": 5},"accuracyType": [ "percentAccuracy": 0.99]} |