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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  ]  } |