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

# Data formats for environmental sensor capabilities

## Ambient noise sensor capability

### General

This sub-clause specifies a sensor capability of an ambient noise sensor.

### Syntax

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

### Semantics

Semantics of the ambientNoiseSensorCapability:

| Name | Definition |
| --- | --- |
| AmbientNoiseSensor CapabilityType | Tool for describing an ambient noise 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 a meter (m). |

### Examples

This example shows the description of an ambient noise sensing capability with the following semantics. The sensed information is received at the location of (1.00, 1.00, -1.00). The unit this sensor measures is in decibel(dB). "minValue" is 20 dB and "maxValue" is 100dB.

|  |
| --- |
| {"sensorCapabilityBaseType": { "unit": "decibel", "maxValue": 100, "minValue": 20},"location": [1.00, 1.00, -1.00]} |

## Temperature sensor capability

### General

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

### Syntax

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

### Semantics

Semantics of the temperatureSensorCapability:

| Name | Definition |
| --- | --- |
| TemperatureSensor CapabilityType | Tool for describing a temperature 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 a meter (m). |

### Examples

This example shows the description of a temperature sensing capability with the following semantics. The sensed information is received at the location of (1.00, 1.00, -1.00). "minValue" is 0 C˚ and "maxValue" is 50 C˚.

|  |
| --- |
| {"sensorCapabilityBaseType": { "unit": "celsius", "minValue": 0, "maxValue": 50},"location": [1.00, 1.00, -1.00]} |

## Humidity sensor capability

### General

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

### Syntax

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

### Semantics

Semantics of the humiditySensorCapability:

| Name | Definition |
| --- | --- |
| HumiditySensor CapabilityType | Tool for describing a humidity 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 a meter (m). |

### Examples

This example shows the description of a humidity sensing capability with the following semantics. The sensed information is received at the location of (1.00, 1.00, -1.00).

|  |
| --- |
| {"sensorCapabilityBaseType": {},"location": [1.00, 1.00, -1.00]} |

## Wind sensor capability

### General

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

### Syntax

|  |
| --- |
| "windSensorCapability": {"type": "object","properties": { "sensoryDeviceCapabilityBaseType": { "$ref": "#/definitions/sensoryDeviceCapabilityBaseType" }, "maxWindSpeed": { "type": "number" }, "unit": { "$ref": "#/definitions/unitType"},"numOfLevels": { "type": "number" "minimum": 0} }} |

### Semantics

Semantics of the windSensorCapability:

| Name | Definition |
| --- | --- |
| WindCapabilityType | Tool for describing a wind capability. |
| maxWindSpeed | Describes the maximum wind speed that the fan can provide in terms of Meter per second. |
| unit | Specifies the unit of the intensity, if a unit other than the default unit specified in the semantics of the maxWindSpeed is used. |
| numOfLevels | Describes the number of wind speed levels that the device can provide in between maximum and minimum speed. |

### Examples

This example shows the description of a wind device capability with the following semantics. The unit this sensor measures is in meter per sec. The maximum wind speed of the wind device (possibly a fan) is 30 meters per second. This specified device can support 5 levels in controlling the wind speed.

|  |
| --- |
| {"sensorCapabilityBaseType": { "unit": "meterpersec"},"maxWindSpeed": 30,"numOfLevels": 5} |

## Gas sensor capability

### General

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

### Syntax

|  |
| --- |
| "gasSensorCapability": {"type": "object","properties": { "sensorCapabilityBaseType": { "$ref": "#/definitions/sensorCapabilityBaseType" }, "gasType": { "$ref": "#/definitions/gasType" }}} |

### Semantics

Semantics of the temperatureSensorCapability:

| Name | Definition |
| --- | --- |
| GasSensorCapabilityType | Tool for describing a gas sensor capability. |
| GasType | Specifies the type of gas as a reference to a term provided by GasType. |

### Examples

This example shows the description of a gas sensing capability with the following semantics. The gas sensor measured methane. The unit this sensor measure is in ppm. "maxValue" is 50 ppm of methane and "minValue" is 1 ppm of methane.

|  |
| --- |
| {"sensorCapabilityBaseType": { "unit": "ppm", "maxValue": 50, "minValue": 1},"gasType" : "methane"} |

## Dust sensor capability

### General

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

### Syntax

|  |
| --- |
| "dustSensorCapability": {"type": "object","properties": { "sensorCapabilityBaseType": { "$ref": "#/definitions/sensorCapabilityBaseType" }}} |

### Semantics

Semantics of the dustSensorCapability:

| Name | Definition |
| --- | --- |
| DustSensorCapabilityType | Tool for describing a dust sensor capability. |

### Examples

This example shows the description of a dust sensing capability with the following semantics. The unit this sensor measures is in ppm. "maxValue" is 20 ppm and "minValue" is 1 ppm.

|  |
| --- |
| {"sensorCapabilityBaseType": { "unit": "ppm", "minValue": 1, "maxValue": 20}} |