|  |  |
| --- | --- |
| Project | **Specification of Sensor Interface for Cyber and Physical World**  <<https://sagroups.ieee.org/2888.1/> **>** |
| Title | **Syntax and semantics of environment-related sensor capabilities** |
| DCN | **2888-21-00XX-000001** |
| Date Submitted | **Oct 13, 2021** |
| Source(s) | Tai-Gil Kwon tgkwon@keti.re.kr (Korea Electronics Technology Institute),  Changseok Yoon csyoon@keti.re.kr (Korea Electronics Technology Institute),  Tae-Beom Lim tblim@keti.re.kr (Korea Electronics Technology Institute),  Kwanghyun Ro [khrho@hansung.ac.kr(Hansung](mailto:khrho@hansung.ac.kr(Hansung) University) |
| Re: |  |
| Abstract | This contribution illustrates the basic JSON schema structure for representing environment-related sensor capabilities in a standardized data format. The semantics and examples of the environment-related sensor capabilities are presented. |
| Purpose | To start discussion on purpose of the standard |
| Notice | This document has been prepared to assist the IEEE 2888 Working Group. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein. |
| Release | The contributor grants a free, irrevocable license to the IEEE to incorporate material contained in this contribution, and any modifications thereof, in the creation of an IEEE Standards publication; to copyright in the IEEE’s name any IEEE Standards publication even though it may include portions of this contribution; and at the IEEE’s sole discretion to permit others to reproduce in whole or in part the resulting IEEE Standards publication. The contributor also acknowledges and accepts that IEEE 2888 may make this contribution public. |
| Patent Policy | The contributor is familiar with IEEE patent policy, as stated in [Section 6 of the IEEE-SA Standards Board bylaws](http://standards.ieee.org/guides/opman/sect6.html#6.3) <[http://standards.ieee.org/guides/bylaws/sect6-7.html#6](http://127.0.0.1:4664/cache?event_id=757737&schema_id=1&s=5X0vID10lu_E6yrIkWkNd4Wz2H8&q=hancock)> and in *Understanding Patent Issues During IEEE Standards Development* <http://standards.ieee.org/board/pat/faq.pdf> |

# Introduction

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

# Data formats for environmental sensor capabilities

## Rain sensor capability

### General

This subclause specifies the capability of a rain sensor.

### Syntax

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

### Semantics

Semantics of the rainSensorCapabilityData:

| Name | Definition |
| --- | --- |
| rainSensor CapabilityData | Tool for describing a rain sensor capability. |

### Examples

This example shows the description of rain sensing capability with the following semantics. The unit of measurement for this sensor is millimeters per hour. "minValue" is 0 millimeters per hour and "maxValue" is 900 millimeters per hour.

|  |
| --- |
| {  "sensorCapabilityBaseData": {  "unit": "millimetersperhour",  "minValue": 0,  "maxValue": 900  },  } |

## Insolation sensor capability

### General

This subclause specifies the capability of an insolation sensor.

### Syntax

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

### Semantics

Semantics of the insolationSensorCapabilityData:

| Name | Definition |
| --- | --- |
| insolationSensor CapabilityData | Tool for describing an insolation sensor capability. |

### Examples

This example shows the description of insolation sensing capability with the following semantics. The unit of measurement for this sensor is watts per square meter. "minValue" is 0 watts per square meter and "maxValue" is 2500 watts per square meter.

|  |
| --- |
| {  "sensorCapabilityBaseData": {  "unit": "wattspersquaremeter",  "minValue": 0,  "maxValue": 2500  }  } |

## Soil Moisture sensor capability

### General

This subclause specifies the capability of a soil moisture sensor.

### Syntax

|  |
| --- |
| "soilmoistureSensorCapabilityData": {  "type": "object",  "properties": {  "sensoryDeviceCapabilityBaseData": {  "$ref": "#/definitions/sensoryDeviceCapabilityBaseData"  },  }  } |

### Semantics

Semantics of the soilmoistureSensorCapabilityData:

| Name | Definition |
| --- | --- |
| soilmoistureCapabilityData | Tool for describing a soil moisture capability. |

### Examples

This example shows the description of a soil moisture sensing capability with the following semantics. The unit of measurement for this sensor is percentage. "minValue" is 0 percent and "maxValue" is 50 percent.

|  |
| --- |
| {  "sensorCapabilityBaseData": {  "unit": "percentage",  "minValue": 0,  "maxValue": 50  }  } |

## Tensiometer sensor capability

### General

This subclause specifies the capability of a tensiometer sensor.

### Syntax

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

### Semantics

Semantics of the tensiometerSensorCapabilityData:

| Name | Definition |
| --- | --- |
| tensiometer SensorCapabilityData | Tool for describing a tensiometer sensor capability. |

### Examples

This example shows the description of a tensiometer sensing capability with the following semantics. The unit of measurement for this sensor is kPa. "minValue" is 0 kPa and "maxValue" is 240 kPa.

|  |
| --- |
| {  "sensorCapabilityBaseData": {  "unit": "kPa",  "minValue": 0,  "maxValue": 240  },  } |

## Electrical Conductivity sensor capability

### General

This subclause specifies the capability of an electrical conductivity sensor.

### Syntax

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

### Semantics

Semantics of the electricalconductivitySensorCapabilityData:

| Name | Definition |
| --- | --- |
| electricalconductivitySensorCapabilityData | Tool for describing an electrical conductivity sensor capability. |

### Examples

This example shows the description of a electrical conductivity sensing capability with the following semantics. The unit of measurement for this sensor is microSiemens per centimeter. "minValue" is 0 microSiemens per centimeter and "minValue" is 20 microSiemens per centimeter.

|  |
| --- |
| {  "sensorCapabilityBaseData": {  "unit": "microSiemenspercentimeter",  "minValue": 0,  "maxValue": 20  }  } |

## Acidity sensor capability

### General

This subclause specifies the capability of an acidity sensor.

### Syntax

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

### Semantics

Semantics of the aciditySensorCapabilityData:

| Name | Definition |
| --- | --- |
| aciditySensorCapabilityData | Tool for describing an acidity sensor capability. |

### Examples

This example shows the description of acidity sensing capability with the following semantics. The unit of measurement for this sensor is pH. "minValue" is 0 pH and "minValue" is 14 pH.

|  |
| --- |
| {  "sensorCapabilityBaseData": {  "unit": "pH",  "minValue": 0,  "maxValue": 14  }  } |