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| Re: |  |
| Abstract | This contribution illustrates the basic JSON schema structure for representing location related sensor information in the physical world in a standardized data format. The semantics and examples of the environmental sensor information are presented. |
| Purpose | To start discussion on purpose of the standard |
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# Data formats for location sensors

## Compass sensor

### General

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

### Syntax

|  |
| --- |
| "compassSensorType": {  "type": "object",  "properties": {  "azimuth": {  "type": "number",  "minimum": 0,  "maximum": 360  },  },  "additionalProperties": false  }, |

### Semantics

Semantics of the compassSensorType:

|  |  |
| --- | --- |
| Name | Definition |
| compassSensorType | Tool for describing sensed information with respect to a compass sensor. |
| azimuth | Describes the sensed value by the compass sensor in 0 to 360 degree. The value 0 means the “Magnetic North pole” direction and 90 means the “East” with clockwise. |

### Examples

In this example, the measured azimuth is 270.

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| --- |
| {  “sensedInfoBaseAttributes”: {},  “compassSensorType”: {  “azimuth”: 270  }  } |

## Orientation sensor

### General

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

### Syntax

|  |
| --- |
| "orientationSensorType": {  "type": "object",  "properties": {  "orientation": {  "type": "array",  "items": {  "type": "number",  "minItems": 3,  "maxItems": 3  }  }  }  }, |

### Semantics

Semantics of the orientationSensor:

| Name | Definition |
| --- | --- |
| orientationSensorType | Tool for describing sensed information with respect to an orientation sensor. |
| orientation | Describes the sensed value by the orientation sensor in a three- dimensional vector in the unit of degree. The orientation shall be measured as the inclined degree (orientation) with respect to the original pose. The original pose shall be the pose of the object sensed at the time of sensor activation. If a calibration has been performed on the orientation of the sensor after activation, the orientation after the calibration shall be considered as the original pose of the object. |

### Examples

In this example, the measured orientation has yaw, pitch, and roll values of 36, -45, and 80, respectively.

|  |
| --- |
| {  “sensedInfoBaseAttributes”: {},  “orientationSensorType”: {  “orientation”: [36, -45, 80]  }  } |

## Position sensor

### General

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

### Syntax

|  |
| --- |
| "positionSensorType": {  "type": "object",  "properties": {  "position": {  "$ref": "#/definitions/float3DVectorType"  },  }  }, |

### Semantics

Semantics of the positionSensorType:

| *Name* | *Definition* |
| --- | --- |
| positionSensorType | Tool for describing sensed information with respect to a position sensor. |
| Position | Describes the 3D value of the position sensor in the unit of meter (m). The origin of the coordinate shall be the position of the object sensed at the time of sensor activation. If a calibration has been performed on the position of the sensor, the origin shall be the position after the calibration. |

### Examples

In this example, the sensor sensed that it moved 20 meters in the x direction, 20 meters in the y direction, and 1 meter in the z direction.

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| --- |
| {  “sensedInfoBaseAttributes”: {},  “positionSensorType”: {  “position”: [20, 10, 1]  }  } |

## Distance sensor

### General

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

### Syntax

|  |
| --- |
| "distanceSensorType": {  "type": "object",  "properties": {  "value": {  "type": "number"  },  "unit": {  "$ref": "#/definitions/unitType"  }  }  }, |

### Semantics

Semantics of the distanceSensorType:

| *Name* | *Definition* |
| --- | --- |
| distanceSensorType | Tool for describing sensed information with respect to a distance sensor. |
| value | Describes the sensed value from the length sensor with respect to the unit defined in the unit attribute. |
| unit | Specifies the unit of the sensed value as a reference to a term that shall be using the unitType. |

### Examples

In this example, the distance from the distance sensor to the object is 15 meters.

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| --- |
| {  “sensedInfoBaseAttributes”: {},  “distanceSensorType”: {  “value”: 15,  “unit”: “meter”  }  } |

## Global position sensor

### General

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

### Syntax

|  |
| --- |
| "globalPositionSensorType": {  "type": "object",  "properties": {  "longitude": {  "type": "number",  "minimum": -180.0,  "maximum": 180.0  },  "latitude": {  "type": "number",  "minimum": -90.0,  "maximum": 90.0  }  },  "required": [  "longitude",  "latitude"  ],  "additionalProperties": false  }, |

### Semantics

Semantics of the GlobalPositionSensorType:

| *Name* | *Definition* |
| --- | --- |
| globalPositionSensorType | Tool for describing sensed information through global positioning system (gps) sensor with respect to a global position. |
| longitude | Describes the position of the sensor in terms of degrees of longitude. Positive values represent eastern longitude and negative values represent western longitude.  ex: -132.236 represents 132.236 degrees West. |
| latitude | Describes the position of the sensor in terms of degrees of latitude. Positive value represents northern latitude and negative value represents southern latitude.  ex: 37.103 represents 37.103 degrees North. |

### Examples

In this example, a longitude is 115.5 and a latitude is 33.971.

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| --- |
| {  “sensedInfoBaseType”: {},  “globalPositionSensorType”: {  “longitude”: 115.5”,  “latitude”: 33.971  }  } |

## Altitude sensor

### General

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

### Syntax

|  |
| --- |
| "altitudeSensorType": {  "type": "object",  "properties": {  "altitude": {  "type": "number",  },  "unit": {  "$ref": "#/definitions/unitType"  }  },  "additionalProperties": false  }, |

### Semantics

Semantics of the altitudeSensorType:

|  |  |
| --- | --- |
| Name | Definition |
| altitudeSensorType | Tool for describing sensed information with respect to a altitude sensor. |
| altitude | Describes the sensed value by the altitude sensor in the unit defined in the unit attribute. |
| unit | Specifies the unit of the sensed value as a reference to a term that shall be using the unitType. |

### Examples

In this example, the measured altitude is 122.1 meter.

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| --- |
| {  “sensedInfoBaseAttributes”: {},  “compassSensorType”: {  “altitude”: 122.1”,  “unit”: “meter”  }  } |