|  |  |
| --- | --- |
| Project | **Specification of Sensor Interface for Cyber and Physical World**<<https://sagroups.ieee.org/2888/> **>** |
| Title | **Semantics and examples correction of location related sensor data** |
| DCN | **2888-20-0050-00-0001** |
| Date Submitted | **Nov. 22nd, 2020**  |
| Source(s) | Sang-Kyun Kim, goldmunt@gmail.com (Myongji University)Min Hyuk Jeong, jmh8900@gmail.com (Myongji University)Hoe Yong Jin, skydesert6410@gmail.com (Myongji University)Kyoungro Yoon, yoonk@konkuk.ac.kr (Konkuk University)Sangkwon Jeong, ceo@joyfun.kr (Joyfun)HyeonWoo Nam, hwnam@dongduk.ac.kr (Dongduk Women’s University)Jeonghwoan Choi jordhanchoi@skonec.com (Skonec Entertainment) |
| Re: |  |
| Abstract | This contribution proposes the corrections of semantics and examples for representing location related sensor information in the physical world in a standardized data format.  |
| 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> |

# Data formats for location sensors

## Compass sensor

### Semantics

The semantics of the compassSensorData:

|  |  |
| --- | --- |
| Name | Definition |
| compassSensorData | Provides a structure for describing sensor data aquired by a compass sensor. |
| azimuth | Describes the value detected by the compass sensor from 0 to 360 degrees. A value of 0 means "magnetic north" direction and 90 means "east" clockwise. |

### Examples

In this example, the measured azimuth is 270.

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

## Orientation sensor

### Semantics

The semantics of the orientationSensorData:

| Name | Definition |
| --- | --- |
| orientationSensorData | Provides a structure for describing sensor data aquired by an orientation sensor. |
| orientation | Describes the value detected by the orientation sensor in a three-dimensional vector in degrees. The direction should be measured as the inclination (direction) relative to the original posture. The original pose is the pose of the object detected when the sensor is activated. If a calibration has been performed for the orientation of the sensor after activation, the orientation after calibration is considered the original pose of the object. |

### Examples

In this example, the measured orientation has yaw, pitch, and roll values of 35, -50, and 22, respectively.

|  |
| --- |
| {“sensedInfoBaseAttributes”: {},“orientationSensorType”: { “orientation”: [35, -50, 22]}} |

## Position sensor

### Semantics

The semantics of the positionSensorData:

| *Name* | *Definition* |
| --- | --- |
| positionSensorData | Provides a structure for describing sensor data aquired by a position sensor. |
| position | Describes the 3D value of the position sensor in meters (m). The origin of the coordinates is the position of the object detected when the sensor is activated. If calibration is performed on the sensor position, the origin becomes the position after calibration. |

### Examples

In this example, the sensor sensed that it moved 30 meters in the x-direction, 15 meters in the y-direction, and 5 meters in the z-direction.

|  |
| --- |
| {“sensedInfoBaseAttributes”: {},“positionSensorType”: { “position”: [30, 15, 5]}} |

## Distance sensor

### Semantics

Semantics of the distanceSensorData:

| *Name* | *Definition* |
| --- | --- |
| distanceSensorData | Provides a structure for describing sensor data aquired by a distance sensor. |
| value | Describes the sensed value from the distance sensor with the unit defined in the unit attribute. |
| unit | Specifies the unit of the detected value as a reference to a term using unitType. |

### Examples

In this example, the distance from the distance sensor to the object is 3 meters.

|  |
| --- |
| {“sensedInfoBaseAttributes”: {},“distanceSensorType”: { “value”: 3, “unit”: “meter”}} |

## Global position sensor

### Semantics

The semantics of the GlobalPositionSensorData:

| *Name* | *Definition* |
| --- | --- |
| globalPositionSensorData | Provides a structure for describing sensor data aquired by the global positioning system (GPS) sensor for a global position. |
| longitude | Describe the location of the sensor in longitude. Positive values represent the eastern longitude and negative values represent the western longitude.ex: -132.236 represents 132.236 degrees West. |
| latitude | Describes the location of the sensor in terms of latitude. Positive values indicate the north latitude and negative values indicate the south latitude.ex: 37.103 represents 37.103 degrees North. |

### Examples

In this example, the longitude is 123.456 and the latitude is 35.789.

|  |
| --- |
| {“sensedInfoBaseType”: {},“globalPositionSensorType”: { “longitude”: 123.456, “latitude”: 35.789}} |

## Altitude sensor

### Semantics

The semantics of the altitudeSensorData:

|  |  |
| --- | --- |
| Name | Definition |
| altitudeSensorData | Provides a structure for describing sensor data aquired by an 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 detected value as a reference to a term using unitType |

### Examples

In this example, the measured altitude is 123.4 meters.

|  |
| --- |
| {“sensedInfoBaseAttributes”: {},“compassSensorType”: { “altitude”: 123.4, “unit”: “meter”}} |