OCF Resource Type OMA Optional Specification

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Introduction

This document, and all the other parts associated with this document, were developed in response to worldwide demand for smart home focused Internet of Things (IoT) devices, such as appliances, door locks, security cameras, sensors, and actuators; these to be modelled and securely controlled, locally and remotely, over an IP network.

While some inter-device communication existed, no universal language had been developed for the IoT. Device makers instead had to choose between disparate frameworks, limiting their market share, or developing across multiple ecosystems, increasing their costs. The burden then falls on end users to determine whether the products they want are compatible with the ecosystem they bought into, or find ways to integrate their devices into their network, and try to solve interoperability issues on their own.

In addition to the smart home, IoT deployments in commercial environments are hampered by a lack of security. This issue can be avoided by having a secure IoT communication framework, which this standard solves.

The goal of these documents is then to connect the next 25 billion devices for the IoT, providing secure and reliable device discovery and connectivity across multiple OSs and platforms. There are multiple proposals and forums driving different approaches, but no single solution addresses the majority of key requirements. This document and the associated parts enable industry consolidation around a common, secure, interoperable approach.

The OCF specification suite is made up of nineteen discrete documents, the documents fall into logical groupings as described herein:

- Core framework
  - Core Specification
  - Security Specification
  - Onboarding Tool Specification
- Bridging framework and bridges
  - Bridging Specification
  - Resource to Alljoyn Interface Mapping Specification
  - OCF Resource to oneM2M Resource Mapping Specification
  - OCF Resource to BLE Mapping Specification
  - OCF Resource to EnOcean Mapping Specification
  - OCF Resource to LWM2M Mapping Specification
  - OCF Resource to UPlus Mapping Specification
  - OCF Resource to Zigbee Cluster Mapping Specification
  - OCF Resource to Z-Wave Mapping Specification
- Resource and Device models
  - Resource Type Specification
  - Device Specification
- Core framework extensions
  - Easy Setup Specification
  - Core Optional Specification
- OCF Cloud
  - Cloud API for Cloud Services Specification

562 – Device to Cloud Services Specification
563 – Cloud Security Specification

OCF OMA Resource Type Optional Specification

1 Scope

The OCF Resource Type specifications are divided into a series of documents:

– Resource Type specification: The specification document specifies the OCF defined Resources and how they are mapped on top of the . This document is mandatory for all Devices to implement.

– OCF OMA Resource Type Optional Specification (this document): The OCF OMA Resource Type Optional Specification document specifies additional resource types that can be used in an OCF Device.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC DIS 20924, *Information Technology – Internet of Things – Vocabulary*, June 2018
https://www.iso.org/standard/69470.html

ISO/IEC 30118-1, Information technology – Open Connectivity Foundation (OCF) Specification – Part 1: Core specification
https://www.iso.org/standard/53238.html
Latest version available at: https://openconnectivity.org/specs/OCF_Core_Specification.pdf

ISO/IEC 30118-2, Information technology – Open Connectivity Foundation (OCF) Specification – Part 2: Security specification
https://www.iso.org/standard/74239.html
Latest version available at: https://openconnectivity.org/specs/OCF_Security_Specification.pdf

IETF RFC 3339, *Date and Time on the Internet: Timestamps*, July 2002
https://www.rfc-editor.org/info/rfc3339

IETF RFC 5234, *Augmented BNF for Syntax Specifications: ABNF*, January 2008
https://www.rfc-editor.org/info/rfc5234

IETF RFC 5424, *The Syslog Protocol*, March 2009
https://tools.ietf.org/html/rfc5424

IETF RFC 5646, *Tags for Identifying Languages*, September 2009
https://www.rfc-editor.org/info/rfc5646

IANA ifType-MIB Definitions
https://www.iana.org/assignments/ianaiftype-mib/ianaiftype-mib

IANA Media Types Assignment, March 2017
http://www.iana.org/assignments/media-types/media-types.xhtml

OpenAPI specification, *fka Swagger RESTful API Documentation Specification*, Version 2.0
https://github.com/OAI/OpenAPI-Specification/blob/master/versions/2.0.md

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 30118-1. ISO/IEC 30118-2, and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

– ISO Online browsing platform: available at https://www.iso.org/obp.

– IEC Electropedia: available at http://www.electropedia.org/.

4 Document conventions and organization

4.1 Conventions

In this document a number of terms, conditions, mechanisms, sequences, parameters, events, states, or similar terms are printed with the first letter of each word in uppercase and the rest lowercase (e.g., Network Architecture). Any lowercase uses of these words have the normal technical English meaning.

In this document, to be consistent with the IETF usages for RESTful operations, the RESTful operation words CRUDN, CREATE, RETRIVE, UPDATE, DELETE, and NOTIFY will have all letters capitalized. Any lowercase uses of these words have the normal technical English meaning.

4.2 Notation

In this document, features are described as required, recommended, allowed or DEPRECATED as follows:

Required (or shall or mandatory)(M).

– These basic features shall be implemented to comply with Core Architecture. The phrases "shall not", and "PROHIBITED" indicate behaviour that is prohibited, i.e. that if performed means the implementation is not in compliance.

Recommended (or should)(S).

– These features add functionality supported by Core Architecture and should be implemented. Recommended features take advantage of the capabilities Core Architecture, usually without imposing major increase of complexity. Notice that for compliance testing, if a recommended feature is implemented, it shall meet the specified requirements to be in compliance with these guidelines. Some recommended features could become requirements in the future. The phrase "should not" indicates behaviour that is permitted but not recommended.

Allowed (may or allowed)(O).

– These features are neither required nor recommended by Core Architecture, but if the feature is implemented, it shall meet the specified requirements to be in compliance with these guidelines.

DEPRECATED.

– Although these features are still described in this document, they should not be implemented except for backward compatibility. The occurrence of a deprecated feature during operation of an implementation compliant with the current document has no effect on the implementation's operation and does not produce any error conditions. Backward compatibility may require that a feature is implemented and functions as specified but it shall never be used by implementations compliant with this document.

Conditionally allowed (CA).

– The definition or behaviour depends on a condition. If the specified condition is met, then the definition or behaviour is allowed, otherwise it is not allowed.

Conditionally required (CR).

– The definition or behaviour depends on a condition. If the specified condition is met, then the definition or behaviour is required. Otherwise the definition or behaviour is allowed as default unless specifically defined as not allowed.

Strings that are to be taken literally are enclosed in "double quotes".

Words that are emphasized are printed in italic.

In all of the Property and Resource definition tables that are included throughout this document the "Mandatory" column indicates that the item detailed is mandatory to implement; the mandating of inclusion of the item in a Resource Payload associated with a CRUDN action is dependent on the applicable schema for that action.

4.3 Data types

Resources are defined using data types derived from JSON values as defined in clause 4.3 in ISO/IEC 30118-1.

5 OMA Resource Type definitions

5.1 Introduction

This clause contains definitions for all optional OMA Resource Types; the complete set is listed in Table 11 – Alphabetical list of Resource Types.
All Resource Types shall be created in accordance with ISO/IEC 30118-1 clause 7.4. All comparisons against a Resource Type shall be case insensitive. All Resource Types in this document are prefixed with “oic.r**.o.**” denoting that it is an OCF **compliant** Resource Type **denoting an OMA resource**.

Table 1 – List of optional OMA Resources Types

Friendly Name (informative)	Resource Type (rt)	Clause
Accelerometer (Object ID 3313)	oic.r.o.accelerometer	5.2
Acidity (Object ID 3326)	oic.r.o.acidity	5.3
Actuation (Object ID 3306)	oic.r.o.actuation	5.4
Addressable Text Display (Object ID 3341)	oic.r.o.addressable.text.display	5.5
Altitude (Object ID 3321)	oic.r.o.altitude	5.6
Analog Input (Object ID 3202)	oic.r.o.analog.input	5.7
Analog Output (Object ID 3203)	oic.r.o.analog.output	5.8
Audio Clip (Object ID 3339)	oic.r.o.audio.clip	5.9
Barometer (Object ID 3315)	oic.r.o.barometer	5.10
Bitmap (Object ID 3349)	oic.r.o.bitmap	5.11
Buzzer (Object ID 3338)	oic.r.o.buzzer	5.12
Colour (Object ID 3335)	oic.r.o.colour	5.13
Concentration (Object ID 3325)	oic.r.o.concentration	5.14
Conductivity (Object ID 3327)	oic.r.o.conductivity	5.15
Current (Object ID 3317)	oic.r.o.current	5.16
Depth (Object ID 3319)	oic.r.o.depth	5.17

Digital Input (Object ID 3200)	oic.r.o.digital.input	5.18
Digital Output (Object ID 3201)	oic.r.o.digital.output	5.19
Dimmer (Object ID 3343)	oic.r.o.dimmer	5.20
Direction (Object ID 3332)	oic.r.o.direction	5.21
Distance (Object ID 3330)	oic.r.o.distance	5.22
Energy (Object ID 3331)	oic.r.o.energy	5.23
Frequency (Object ID 3318)	oic.r.o.frequency	5.24
Generic Sensor (Object ID 3300)	oic.r.o.generic.sensor	5.25
Gyrometer (Object ID 3334)	oic.r.o.gyrometer	5.26
Humidity (Object ID 3304)	oic.r.o.humidity	5.27
Illuminance (Object ID 3301)	oic.r.o.illuminance	5.28
Light Control (Object ID 3311)	oic.r.o.light.control	5.29
Load (Object ID 3322)	oic.r.o.load	5.30
Load Control (Object ID 3310)	oic.r.o.load.control	5.31
Location (Object ID 3336)	oic.r.o.location	5.32
Loudness (Object ID 3324)	oic.r.o.loudness	5.33
Magnetometer (Object ID 3314)	oic.r.o.magnetometer	5.34
Multiple Axis Joystick (Object ID 3345)	oic.r.o.multiple.axis.joystick	5.35
Multi-state Selector (Object ID 3348)	oic.r.o.multi-state.selector	5.36
On/Off switch (Object ID 3342)	oic.r.o.on.off.switch	5.37
Percentage (Object ID 3320)	oic.r.o.percentage	5.38
Positioner (Object ID 3337)	oic.r.o.positioner	5.39
Power (Object ID 3328)	oic.r.o.power	5.40
Power Control (Object ID 3312)	oic.r.o.power.control	5.41
Power Factor (Object ID 3329)	oic.r.o.power.factor	5.42
Power Measurement (Object ID 3305)	oic.r.o.power.measurement	5.43
Presence (Object ID 3302)	oic.r.o.presence	5.44
Pressure (Object ID 3323)	oic.r.o.pressure	5.45
Push button (Object ID 3347)	oic.r.o.push.button	5.46
Rate (Object ID 3346)	oic.r.o.rate	5.47
Set Point (Object ID 3308)	oic.r.o.set.point	5.48
Stopwatch (Object ID 3350)	oic.r.o.stopwatch	5.49
Temperature (Object ID 3303)	oic.r.o.temperature	5.50
Time (Object ID 3333)	oic.r.o.time	5.51
Timer (Object ID 3340)	oic.r.o.timer	5.52
Voltage (Object ID 3316)	oic.r.o.voltage	5.53

5.2 OMA/IPSO Accelerometer (Object ID 3313)

5.2.1 Introduction

This IPSO object can be used to represent a 1-3 axis accelerometer.

5.2.2 Example URI

/Omaipsoaccelerometerobjectid3313ResURI

5.2.3 Resource type

The Resource Type is defined as: "oic.r.o.accelerometer".

5.2.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Accelerometer (Object ID 3313)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsoaccelerometerobjectid3313ResURI": {
      "get": {
        "description": " This IPSO object can be used to represent a 1-3 axis accelerometer.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsoaccelerometerobjectid3313"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
```

```
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsoaccelerometerobjectid3313": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.accelerometer"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "X_Value": {
          "description": "The measured value along the X axis.",
          "x-label": "X Value",
          "type": "number",
          "readOnly": true
        },
        "Y_Value": {
          "description": "The measured value along the Y axis.",
          "x-label": "Y Value",
          "type": "number",
          "readOnly": true
        },
        "Z_Value": {
          "description": "The measured value along the Z axis.",
          "x-label": "Z Value",
          "type": "number",
          "readOnly": true
        },
        "Sensor_Units": {
          "description": "Measurement Units Definition.",
          "x-label": "Sensor Units",
          "type": "string",
          "readOnly": true
        },
        "Min_Range_Value": {
          "description": "The minimum value that can be measured by the sensor.",
          "x-label": "Min Range Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Range_Value": {
          "description": "The maximum value that can be measured by the sensor.",
          "x-label": "Max Range Value",
```

```
          "type": "number",
          "readOnly": true
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "X_Value"
      ]
    }
  }
}
```

5.2.5 Property definition

Table 2 defines the Properties that are part of the "oic.r.o.accelerometer" Resource Type.

Table 2 – The Property definitions of the Resource with type "rt" = "oic.r.o.accelerometer".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.

n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
X_Value	number	Yes	Read Only	The measured value along the X axis.
Y_Value	number	No	Read Only	The measured value along the Y axis.
Z_Value	number	No	Read Only	The measured value along the Z axis.
Sensor_Units	string	No	Read Only	Measurement Units Definition.
Min_Range_Value	number	No	Read Only	The minimum value that can be measured by the sensor.
Max_Range_Value	number	No	Read Only	The maximum value that can be measured by the sensor.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:

				Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.2.6 CRUDN behaviour

Table 3 defines the CRUDN operations that are supported on the "oic.r.o.accelerometer" Resource Type.

Table 3 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.accelerometer".

Create	Read	Update	Delete	Notify
	get			observe

5.3 OMA/IPSO Acidity (Object ID 3326)

5.3.1 Introduction

This IPSO object should be used to report an acidity measurement of a liquid. It also provides resources for minimum and maximum measured values, as well as the minimum and maximum range that can be measured by the sensor. An example measurement unit is pH.

5.3.2 Example URI

/Omaipsoacidityobjectid3326ResURI

5.3.3 Resource type

The Resource Type is defined as: "oic.r.o.acidity".

5.3.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Acidity (Object ID 3326)",
```

```
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsoacidityobjectid3326ResURI": {
      "get": {
        "description": " This IPSO object should be used to report an acidity measurement of a
liquid. It also provides resources for minimum and maximum measured values, as well as the minimum
and maximum range that can be measured by the sensor. An example measurement unit is pH.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsoacidityobjectid3326"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsoacidityobjectid3326": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.acidity"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
```

```
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Sensor_Value": {
          "description": "Last or Current Measured Value from the Sensor.",
          "x-label": "Sensor Value",
          "type": "number",
          "readOnly": true
        },
        "Sensor_Units": {
          "description": "Measurement Units Definition.",
          "x-label": "Sensor Units",
          "type": "string",
          "readOnly": true
        },
        "Min_Measured_Value": {
          "description": "The minimum value measured by the sensor since power ON or reset.",
          "x-label": "Min Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Measured_Value": {
          "description": "The maximum value measured by the sensor since power ON or reset.",
          "x-label": "Max Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Min_Range_Value": {
          "description": "The minimum value that can be measured by the sensor.",
          "x-label": "Min Range Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Range_Value": {
          "description": "The maximum value that can be measured by the sensor.",
          "x-label": "Max Range Value",
          "type": "number",
          "readOnly": true
        },
        "Current_Calibration": {
          "description": "Read or Write the current calibration coefficient.",
          "x-label": "Current Calibration",
          "type": "number"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
```



```
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
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Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Sensor_Value"
      ]
    }
  }
}
```

5.3.5 Property definition

Table 4 defines the Properties that are part of the "oic.r.o.acidity" Resource Type.

Table 4 – The Property definitions of the Resource with type "rt" = "oic.r.o.acidity".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Sensor_Value	number	Yes	Read Only	Last or Current Measured Value from the Sensor.
Sensor_Units	string	No	Read Only	Measurement Units Definition.
Min_Measured_Value	number	No	Read Only	The minimum value measured by the sensor since power ON or reset.
Max_Measured_Value	number	No	Read Only	The maximum value measured by the sensor since power ON or reset.

Min_Range_Value	number	No	Read Only	The minimum value that can be measured by the sensor.
Max_Range_Value	number	No	Read Only	The maximum value that can be measured by the sensor.
Current_Calibration	number	No	Read Write	Read or Write the current calibration coefficient.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that

				quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.3.6 CRUDN behaviour

Table 5 defines the CRUDN operations that are supported on the "oic.r.o.acidity" Resource Type.

Table 5 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.acidity".

Create	Read	Update	Delete	Notify
	get			observe

5.4 OMA/IPSO Actuation (Object ID 3306)

5.4.1 Introduction

This IPSO object is dedicated to remote actuation such as ON/OFF action or dimming. A multi-state output can also be described as a string. This is useful to send pilot wire orders for instance. It also provides a resource to reflect the time that the device has been switched on.

5.4.2 Example URI

/Omaipsoactuationobjectid3306ResURI

5.4.3 Resource type

The Resource Type is defined as: "oic.r.o.actuation".

5.4.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Actuation (Object ID 3306)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsoactuationobjectid3306ResURI": {
      "get": {
        "description": " This IPSO object is dedicated to remote actuation such as ON/OFF action or
```

```
dimming. A multi-state output can also be described as a string. This is useful to send pilot wire
orders for instance. It also provides a resource to reflect the time that the device has been
switched on.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsoactuationobjectid3306"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsoactuationobjectid3306": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.actuation"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "On_Off": {
          "description": "On/off control. Boolean value where True is On and False is Off.",
          "x-label": "On/Off",
          "type": "boolean"
        },
        "Dimmer": {
          "description": "This resource represents a dimmer setting, which has an Integer value
```

```
between 0 and 100 as a percentage.",
          "x-label": "Dimmer",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "x-unit": "/100"
        },
        "On_time": {
          "description": "The time in seconds that the device has been on. Writing a value of 0
resets the counter.",
          "x-label": "On time",
          "type": "integer",
          "x-unit": "s"
        },
        "Multi-state_Output": {
          "description": "A string describing a state for multiple level output such as Pilot
Wire.",
          "x-label": "Multi-state Output",
          "type": "string"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "On_Off"
      ]
    }
  }
}
```

5.4.5 Property definition

Table 6 defines the Properties that are part of the "oic.r.o.actuation" Resource Type.

Table 6 – The Property definitions of the Resource with type "rt" = "oic.r.o.actuation".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
On_Off	boolean	Yes	Read Write	On/off control. Boolean value where

				True is On and False is Off.
Dimmer	integer	No	Read Write	This resource represents a dimmer setting, which has an Integer value between 0 and 100 as a percentage.
On_time	integer	No	Read Write	The time in seconds that the device has been on. Writing a value of 0 resets the counter.
Multi-state_Output	string	No	Read Write	A string describing a state for multiple level output such as Pilot Wire.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).

5.4.6 CRUDN behaviour

Table 7 defines the CRUDN operations that are supported on the "oic.r.o.actuation" Resource Type.

Table 7 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.actuation".

Create	Read	Update	Delete	Notify
	get			observe

5.5 OMA/IPSO Addressable Text Display (Object ID 3341)

5.5.1 Introduction

This IPSO object is used to send text to a text-only or text mode graphics display. Writing a string of text to the text resource causes it to be displayed at the selected X and Y locations on the display. If X or Y are set to a value greater than the size of the display, the position "wraps around" to the modulus of the setting and the display size. Likewise, if the text string overflows the display size, the text "wraps around" and displays on the next line down or, if the last line has been written, wraps around to the top of the display. Brightness and Contrast controls are provided to allow control of various display types including STN and DSTN type LCD character displays. Writing an empty payload to the Clear Display resource causes the display to be erased.

5.5.2 Example URI

/Omaipsoaddressabletextdisplayobjectid3341ResURI

5.5.3 Resource type

The Resource Type is defined as: "oic.r.o.addressable.text.display".

5.5.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Addressable Text Display (Object ID 3341)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsoaddressabletextdisplayobjectid3341ResURI": {
      "get": {
        "description": " This IPSO object is used to send text to a text-only or text mode graphics display. Writing a string of text to the text resource causes it to be displayed at the selected X and Y locations on the display. If X or Y are set to a value greater than the size of the display, the position \"wraps around\" to the modulus of the setting and the display size. Likewise, if the text string overflows the display size, the text \"wraps around\" and displays on the next line down or, if the last line has been written, wraps around to the top of the display. Brightness and Contrast controls are provided to allow control of various display types including STN and DSTN type LCD character displays. Writing an empty payload to the Clear Display resource causes the display to be erased.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsoaddressabletextdisplayobjectid3341"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsoaddressabletextdisplayobjectid3341": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.addressable.text.display"
            ],
            "type": "string"
          },
          "minItems": 1,
```

```
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Text": {
          "description": "A string of text.",
          "x-label": "Text",
          "type": "string"
        },
        "X_Coordinate": {
          "description": "X Coordinate.",
          "x-label": "X Coordinate",
          "type": "integer"
        },
        "Y_Coordinate": {
          "description": "Y Coordinate.",
          "x-label": "Y Coordinate",
          "type": "integer"
        },
        "Max_X_Coordinate": {
          "description": "The highest X coordinate the display supports before wrapping to the next
line.",
          "x-label": "Max X Coordinate",
          "type": "integer",
          "readOnly": true
        },
        "Max_Y_Coordinate": {
          "description": "The highest Y coordinate the display supports before wrapping to the next
line.",
          "x-label": "Max Y Coordinate",
          "type": "integer",
          "readOnly": true
        },
        "Level": {
          "description": "Used to represent a level control such as audio volume.",
          "x-label": "Level",
          "maximum": 100,
          "minimum": 0,
          "type": "number",
          "x-unit": "/100"
        },
        "Contrast": {
          "description": "Proportional control, integer value between 0 and 100 as a percentage.",
          "x-label": "Contrast",
          "maximum": 100,
          "minimum": 0,
          "type": "number",
          "x-unit": "/100"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
```

```
          "type": "string"
        }
      },
      "type": "object",
      "required": [
        "Text"
      ]
    }
  }
}
```

5.5.5 Property definition

Table 8 defines the Properties that are part of the "oic.r.o.addressable.text.display" Resource Type.

Table 8 – The Property definitions of the Resource with type "rt" = "oic.r.o.addressable.text.display".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Text	string	Yes	Read Write	A string of text.
X_Coordinate	integer	No	Read Write	X Coordinate.
Y_Coordinate	integer	No	Read Write	Y Coordinate.
Max_X_Coordinate	integer	No	Read Only	The highest X coordinate the display supports before wrapping to the next line.
Max_Y_Coordinate	integer	No	Read Only	The highest Y coordinate the display supports before wrapping to the next line.
Level	number	No	Read Write	Used to represent a level control such as audio volume.
Contrast	number	No	Read Write	Proportional control, integer value between 0 and 100 as a percentage.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.

5.5.6 CRUDN behaviour

Table 9 defines the CRUDN operations that are supported on the "oic.r.o.addressable.text.display" Resource Type.

Table 9 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.addressable.text.display".

Create	Read	Update	Delete	Notify
	get			observe

5.6 OMA/IPSO Altitude (Object ID 3321)

5.6.1 Introduction

This IPSO object should be used with an altitude sensor to report altitude above sea level in meters. Note that Altitude can be calculated from the measured pressure given the local sea level pressure. It also provides resources for minimum and maximum measured values, as well as the minimum and maximum range that can be measured by the sensor. An example measurement unit is meters.

5.6.2 Example URI

/Omaipsoaltitudeobjectid3321ResURI

5.6.3 Resource type

The Resource Type is defined as: "oic.r.o.altitude".

5.6.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Altitude (Object ID 3321)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsoaltitudeobjectid3321ResURI": {
      "get": {
        "description": " This IPSO object should be used with an altitude sensor to report altitude
above sea level in meters. Note that Altitude can be calculated from the measured pressure given the
local sea level pressure.  It also provides resources for minimum and maximum measured values, as
well as the minimum and maximum range that can be measured by the sensor. An example measurement
unit is meters.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsoaltitudeobjectid3321"
            }
          }
        }
      }
    }
  },
```

```
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsoaltitudeobjectid3321": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.altitude"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Sensor_Value": {
          "description": "Last or Current Measured Value from the Sensor.",
          "x-label": "Sensor Value",
          "type": "number",
          "readOnly": true
        },
        "Sensor_Units": {
          "description": "Measurement Units Definition.",
          "x-label": "Sensor Units",
          "type": "string",
          "readOnly": true
        },
        "Min_Measured_Value": {
          "description": "The minimum value measured by the sensor since power ON or reset.",
          "x-label": "Min Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Measured_Value": {
          "description": "The maximum value measured by the sensor since power ON or reset.",
          "x-label": "Max Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Min_Range_Value": {
          "description": "The minimum value that can be measured by the sensor.",
```



```
          "x-label": "Min Range Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Range_Value": {
          "description": "The maximum value that can be measured by the sensor.",
          "x-label": "Max Range Value",
          "type": "number",
          "readOnly": true
        },
        "Current_Calibration": {
          "description": "Read or Write the current calibration coefficient.",
          "x-label": "Current Calibration",
          "type": "number"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Sensor_Value"
      ]
    }
  }
}
```


5.6.5 Property definition

Table 10 defines the Properties that are part of the "oic.r.o.altitude" Resource Type.

Table 10 – The Property definitions of the Resource with type "rt" = "oic.r.o.altitude".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Sensor_Value	number	Yes	Read Only	Last or Current Measured Value from the Sensor.
Sensor_Units	string	No	Read Only	Measurement Units Definition.
Min_Measured_Value	number	No	Read Only	The minimum value measured by the sensor since power ON or reset.
Max_Measured_Value	number	No	Read Only	The maximum value measured by the sensor since power ON or reset.
Min_Range_Value	number	No	Read Only	The minimum value that can be measured by the sensor.
Max_Range_Value	number	No	Read Only	The maximum value that can be measured by the sensor.
Current_Calibration	number	No	Read Write	Read or Write the current calibration coefficient.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because

				they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.6.6 CRUDN behaviour

Table 11 defines the CRUDN operations that are supported on the "oic.r.o.altitude" Resource Type.

Table 11 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.altitude".

Create	Read	Update	Delete	Notify
	get			observe

5.7 OMA/IPSO Analog Input (Object ID 3202)

5.7.1 Introduction

Generic analog input for non-specific sensors

5.7.2 Example URI

/Omaipsoanaloginputobjectid3202ResURI

5.7.3 Resource type

The Resource Type is defined as: "oic.r.o.analog.input".

5.7.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Analog Input (Object ID 3202)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsoanaloginputobjectid3202ResURI": {
      "get": {
        "description": " Generic analog input for non-specific sensors",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsoanaloginputobjectid3202"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsoanaloginputobjectid3202": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.analog.input"
            ],
            "type": "string"
          },
          "minItems": 1,
```

```
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Analog_Input_Current_Value": {
          "description": "The current value of the analog input.",
          "x-label": "Analog Input Current Value",
          "type": "number",
          "readOnly": true
        },
        "Min_Measured_Value": {
          "description": "The minimum value measured by the sensor since power ON or reset.",
          "x-label": "Min Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Measured_Value": {
          "description": "The maximum value measured by the sensor since power ON or reset.",
          "x-label": "Max Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Min_Range_Value": {
          "description": "The minimum value that can be measured by the sensor.",
          "x-label": "Min Range Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Range_Value": {
          "description": "The maximum value that can be measured by the sensor.",
          "x-label": "Max Range Value",
          "type": "number",
          "readOnly": true
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Sensor_Type": {
          "description": "The type of the sensor (for instance PIR type).",
          "x-label": "Sensor Type",
          "type": "string",
          "readOnly": true
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
```

```
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Analog_Input_Current_Value"
      ]
    }
  }
}
```

5.7.5 Property definition

Table 12 defines the Properties that are part of the "oic.r.o.analog.input" Resource Type.

Table 12 – The Property definitions of the Resource with type "rt" = "oic.r.o.analog.input".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Analog_Input_Current_Value	number	Yes	Read Only	The current value of the analog input.
Min_Measured_Value	number	No	Read Only	The minimum value measured by the sensor since power ON or reset.
Max_Measured_Value	number	No	Read Only	The maximum value measured by

				the sensor since power ON or reset.
Min_Range_Value	number	No	Read Only	The minimum value that can be measured by the sensor.
Max_Range_Value	number	No	Read Only	The maximum value that can be measured by the sensor.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Sensor_Type	string	No	Read Only	The type of the sensor (for instance PIR type).
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality

				check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.7.6 CRUDN behaviour

Table 13 defines the CRUDN operations that are supported on the "oic.r.o.analog.input" Resource Type.

Table 13 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.analog.input".

Create	Read	Update	Delete	Notify
	get			observe

5.8 OMA/IPSO Analog Output (Object ID 3203)

5.8.1 Introduction

This IPSO object is a generic object that can be used with any kind of analog output interface.

5.8.2 Example URI

/Omaipsoanalogoutputobjectid3203ResURI

5.8.3 Resource type

The Resource Type is defined as: "oic.r.o.analog.output".

5.8.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Analog Output (Object ID 3203)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsoanalogoutputobjectid3203ResURI": {
```



```
      "get": {
        "description": " This IPSO object is a generic object that can be used with any kind of
analog output interface.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsoanalogoutputobjectid3203"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsoanalogoutputobjectid3203": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.analog.output"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Analog_Output_Current_Value": {
          "description": "The current value of the analog output.",
          "x-label": "Analog Output Current Value",
          "maximum": 1,
          "minimum": 0,
          "type": "number"
        },
```

```
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Min_Range_Value": {
          "description": "The minimum value that can be measured by the sensor.",
          "x-label": "Min Range Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Range_Value": {
          "description": "The maximum value that can be measured by the sensor.",
          "x-label": "Max Range Value",
          "type": "number",
          "readOnly": true
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Analog_Output_Current_Value"
      ]
    }
  }
}
```

5.8.5 Property definition

Table 14 defines the Properties that are part of the "oic.r.o.analog.output" Resource Type.

Table 14 – The Property definitions of the Resource with type "rt" = "oic.r.o.analog.output".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Analog_Output_Current_Value	number	Yes	Read Write	The current value of the analog output.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.

Min_Range_Value	number	No	Read Only	The minimum value that can be measured by the sensor.
Max_Range_Value	number	No	Read Only	The maximum value that can be measured by the sensor.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).

5.8.6 CRUDN behaviour

Table 15 defines the CRUDN operations that are supported on the "oic.r.o.analog.output" Resource Type.

Table 15 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.analog.output".

Create	Read	Update	Delete	Notify
	get			observe

5.9 OMA/IPSO Audio Clip (Object ID 3339)

5.9.1 Introduction

This IPSO object should be used for a speaker that plays a pre-recorded audio clip or an audio output that is sent elsewhere. For example, an elevator which announces the floor of the building. A resource is provided to store the clip, a dimmer resource controls the relative sound level of the playback, and a duration resource limits the maximum playback time. After the duration time is reached, any remaining samples in the clip are ignored, and the clip player will be ready to play another clip.

5.9.2 Example URI

/Omaipsoaudioclipobjectid3339ResURI

5.9.3 Resource type

The Resource Type is defined as: "oic.r.o.audio.clip".

5.9.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Audio Clip (Object ID 3339)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
```

```
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsoaudioclipobjectid3339ResURI": {
      "get": {
        "description": " This IPSO object should be used for a speaker that plays a pre-recorded
audio clip or an audio output that is sent elsewhere. For example, an elevator which announces the
floor of the building. A resource is provided to store the clip, a dimmer resource controls the
relative sound level of the playback, and a duration resource limits the maximum playback time.
After the duration time is reached, any remaining samples in the clip are ignored, and the clip
player will be ready to play another clip.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsoaudioclipobjectid3339"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsoaudioclipobjectid3339": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.audio.clip"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
```

```
          "type": "array"
        },
        "Clip": {
          "description": "Audio clip that is playable (e.g., a short audio recording indicating the
floor in an elevator).",
          "x-label": "Clip",
          "x-sdfType": "byte-string",
          "type": "string"
        },
        "Level": {
          "description": "Used to represent a level control such as audio volume.",
          "x-label": "Level",
          "maximum": 100,
          "minimum": 0,
          "type": "number",
          "x-unit": "/100"
        },
        "Duration": {
          "description": "The duration of the sound once trigger.",
          "x-label": "Duration",
          "type": "number",
          "x-unit": "s"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        }
      },
      "type": "object",
      "required": [
        "Clip"
      ]
    }
  }
}
```

5.9.5 Property definition

Table 16 defines the Properties that are part of the "oic.r.o.audio.clip" Resource Type.

Table 16 – The Property definitions of the Resource with type "rt" = "oic.r.o.audio.clip".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Clip	string	Yes	Read Write	Audio clip that is playable (e.g., a short audio recording indicating the floor in an elevator).
Level	number	No	Read Write	Used to represent a level control such as audio volume.
Duration	number	No	Read Write	The duration of the sound once trigger.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string

				depending on the use case.

5.9.6 CRUDN behaviour

Table 17 defines the CRUDN operations that are supported on the "oic.r.o.audio.clip" Resource Type.

Table 17 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.audio.clip".

Create	Read	Update	Delete	Notify
	get			observe

5.10 OMA/IPSO Barometer (Object ID 3315)

5.10.1 Introduction

This IPSO object should be used with an air pressure sensor to report a barometer measurement. It also provides resources for minimum/maximum measured values and the minimum/maximum range that can be measured by the barometer sensor. An example measurement unit is pascals.

5.10.2 Example URI

/Omaipsobarometerobjectid3315ResURI

5.10.3 Resource type

The Resource Type is defined as: "oic.r.o.barometer".

5.10.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Barometer (Object ID 3315)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsobarometerobjectid3315ResURI": {
      "get": {
        "description": " This IPSO object should be used with an air pressure sensor to report a
barometer measurement.  It also provides resources for minimum/maximum measured values and the
minimum/maximum range that can be measured by the barometer sensor. An example measurement unit is
pascals.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsobarometerobjectid3315"
            }
```

```
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsobarometerobjectid3315": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.barometer"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Sensor_Value": {
          "description": "Last or Current Measured Value from the Sensor.",
          "x-label": "Sensor Value",
          "type": "number",
          "readOnly": true
        },
        "Min_Measured_Value": {
          "description": "The minimum value measured by the sensor since power ON or reset.",
          "x-label": "Min Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Measured_Value": {
          "description": "The maximum value measured by the sensor since power ON or reset.",
          "x-label": "Max Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Min_Range_Value": {
          "description": "The minimum value that can be measured by the sensor.",
          "x-label": "Min Range Value",
```

```
          "type": "number",
          "readOnly": true
        },
        "Max_Range_Value": {
          "description": "The maximum value that can be measured by the sensor.",
          "x-label": "Max Range Value",
          "type": "number",
          "readOnly": true
        },
        "Sensor_Units": {
          "description": "Measurement Units Definition.",
          "x-label": "Sensor Units",
          "type": "string",
          "readOnly": true
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Sensor_Value"
      ]
    }
  }
}
```

5.10.5 Property definition

Table 18 defines the Properties that are part of the "oic.r.o.barometer" Resource Type.

Table 18 – The Property definitions of the Resource with type "rt" = "oic.r.o.barometer".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Sensor_Value	number	Yes	Read Only	Last or Current Measured Value from the Sensor.
Min_Measured_Value	number	No	Read Only	The minimum value measured by the sensor since power ON or reset.
Max_Measured_Value	number	No	Read Only	The maximum value measured by the sensor since power ON or reset.
Min_Range_Value	number	No	Read Only	The minimum value that can be measured by the sensor.
Max_Range_Value	number	No	Read Only	The maximum value that can be measured by the sensor.
Sensor_Units	string	No	Read Only	Measurement Units Definition.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY

				The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.10.6 CRUDN behaviour

Table 19 defines the CRUDN operations that are supported on the "oic.r.o.barometer" Resource Type.

Table 19 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.barometer".

Create	Read	Update	Delete	Notify
	get			observe

5.11 OMA/IPSO Bitmap (Object ID 3349)

5.11.1 Introduction

Summarize several digital inputs to one value by mapping each bit to a digital input.

5.11.2 Example URI

/Omaipsobitmapobjectid3349ResURI

5.11.3 Resource type

The Resource Type is defined as: "oic.r.o.bitmap".

5.11.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Bitmap (Object ID 3349)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsobitmapobjectid3349ResURI": {
      "get": {
        "description": " Summarize several digital inputs to one value by mapping each bit to a
digital input.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsobitmapobjectid3349"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsobitmapobjectid3349": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.bitmap"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
```

```
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Bitmap_Input": {
          "description": "Integer in which each of the bits are associated with specific digital
input value. Represented as a binary signed integer in network byte order, and in two's complement
representation. Using values in range 0-127 is recommended to avoid ambiguities with byte order and
negative values.",
          "x-label": "Bitmap Input",
          "type": "integer",
          "readOnly": true
        },
        "Element_Description": {
          "description": "The description of each bit as a string. First instance describes the
least significant bit, second instance the second least significant bit.",
          "items": {
            "type": "string"
          },
          "x-label": "Element Description",
          "type": "array"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Bitmap_Input"
      ]
    }
  }
}
```

5.11.5 Property definition

Table 20 defines the Properties that are part of the "oic.r.o.bitmap" Resource Type.

Table 20 – The Property definitions of the Resource with type "rt" = "oic.r.o.bitmap".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Bitmap_Input	integer	Yes	Read Only	Integer in which each of the bits are associated with specific digital input value. Represented as a binary signed integer in network byte order, and in two's complement representation. Using values in range 0-127 is recommended to avoid ambiguities with byte order and negative values.
Element_Description	array: see schema	No	Read Write	The description of each bit as a string. First instance describes the least significant bit, second instance the second least significant bit.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).

5.11.6 CRUDN behaviour

Table 21 defines the CRUDN operations that are supported on the "oic.r.o.bitmap" Resource Type.

Table 21 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.bitmap".

Create	Read	Update	Delete	Notify
	get			observe

5.12 OMA/IPSO Buzzer (Object ID 3338)

5.12.1 Introduction

This IPSO object should be used to actuate an audible alarm such as a buzzer, beeper, or vibration alarm. There is a dimmer control for setting the relative level of the alarm, and an optional duration control to limit the length of time the alarm sounds when turned on. Each time "true" is written to the On/Off resource, the alarm will sound again for the configured duration. If no duration is programmed or the setting is "false", writing a "true" to the On/Off resource will result in the alarm sounding continuously until a "false" is written to the On/Off resource.

5.12.2 Example URI

/Omaipsobuzzerobjectid3338ResURI

5.12.3 Resource type

The Resource Type is defined as: "oic.r.o.buzzer".

5.12.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Buzzer (Object ID 3338)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsobuzzerobjectid3338ResURI": {
      "get": {
        "description": " This IPSO object should be used to actuate an audible alarm such as a
buzzer, beeper, or vibration alarm. There is a dimmer control for setting the relative level of the
alarm, and an optional duration control to limit the length of time the alarm sounds when turned on.
Each time \"true\" is written to the On/Off resource, the alarm will sound again for the configured
duration. If no duration is programmed or the setting is \"false\", writing a \"true\" to the On/Off
resource will result in the alarm sounding continuously until a \"false\" is written to the On/Off
resource.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsobuzzerobjectid3338"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
```

```
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsobuzzerobjectid3338": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.buzzer"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "On_Off": {
          "description": "On/off control. Boolean value where True is On and False is Off.",
          "x-label": "On/Off",
          "type": "boolean"
        },
        "Level": {
          "description": "Used to represent a level control such as audio volume.",
          "x-label": "Level",
          "maximum": 100,
          "minimum": 0,
          "type": "number",
          "x-unit": "/100"
        },
        "Delay_Duration": {
          "description": "The duration of the time delay.",
          "x-label": "Delay Duration",
          "type": "number",
          "x-unit": "s"
        },
        "Minimum_Off-time": {
          "description": "The duration of the rearm delay (i.e. the delay from the end of one cycle
until the beginning of the next, the inhibit time).",
          "x-label": "Minimum Off-time",
          "type": "number",
          "x-unit": "s"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
```



```
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "On_Off",
        "Minimum_Off-time"
      ]
    }
  }
}
```

5.12.5 Property definition

Table 22 defines the Properties that are part of the "oic.r.o.buzzer" Resource Type.

Table 22 – The Property definitions of the Resource with type "rt" = "oic.r.o.buzzer".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
On_Off	boolean	Yes	Read Write	On/off control. Boolean value where True is On and False is Off.
Level	number	No	Read Write	Used to represent a level control such as audio volume.
Delay_Duration	number	No	Read Write	The duration of the time delay.
Minimum_Off-time	number	Yes	Read Write	The duration of the rearm delay (i.e. the delay from the end of one cycle until the beginning of the next, the inhibit time).
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the

				measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).

5.12.6 CRUDN behaviour

Table 23 defines the CRUDN operations that are supported on the "oic.r.o.buzzer" Resource Type.

Table 23 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.buzzer".

Create	Read	Update	Delete	Notify
	get			observe

5.13 OMA/IPSO Colour (Object ID 3335)

5.13.1 Introduction

This IPSO object should be used to report the measured value of a colour sensor in some colour space described by the units resource.

5.13.2 Example URI

/Omaipsocolourobjectid3335ResURI

5.13.3 Resource type

The Resource Type is defined as: "oic.r.o.colour".

5.13.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Colour (Object ID 3335)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsocolourobjectid3335ResURI": {
      "get": {
        "description": " This IPSO object should be used to report the measured value of a colour
sensor in some colour space described by the units resource.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsocolourobjectid3335"
```

```
          }
        }
      }
    }
  }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsocolourobjectid3335": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.colour"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Colour": {
          "description": "A string representing a value in some color space.",
          "x-label": "Colour",
          "type": "string"
        },
        "Sensor_Units": {
          "description": "Measurement Units Definition.",
          "x-label": "Sensor Units",
          "type": "string",
          "readOnly": true
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
```

```
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Colour"
      ]
    }
  }
}
```

5.13.5 Property definition

Table 24 defines the Properties that are part of the "oic.r.o.colour" Resource Type.

Table 24 – The Property definitions of the Resource with type "rt" = "oic.r.o.colour".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Colour	string	Yes	Read Write	A string representing a value in some color space.

Sensor_Units	string	No	Read Only	Measurement Units Definition.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by

				the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.13.6 CRUDN behaviour

Table 25 defines the CRUDN operations that are supported on the "oic.r.o.colour" Resource Type.

Table 25 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.colour".

Create	Read	Update	Delete	Notify
	get			observe

5.14 OMA/IPSO Concentration (Object ID 3325)

5.14.1 Introduction

This IPSO object should be used to the particle concentration measurement of a medium. It also provides resources for minimum and maximum measured values, as well as the minimum and maximum range that can be measured by the sensor. An example measurement unit is parts per million.

5.14.2 Example URI

/Omaipsoconcentrationobjectid3325ResURI

5.14.3 Resource type

The Resource Type is defined as: "oic.r.o.concentration".

5.14.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Concentration (Object ID 3325)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsoconcentrationobjectid3325ResURI": {
      "get": {
        "description": " This IPSO object should be used to the particle concentration measurement
of a medium. It also provides resources for minimum and maximum measured values, as well as the
minimum and maximum range that can be measured by the sensor. An example measurement unit is parts
per million.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
```

```
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsoconcentrationobjectid3325"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsoconcentrationobjectid3325": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.concentration"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Sensor_Value": {
          "description": "Last or Current Measured Value from the Sensor.",
          "x-label": "Sensor Value",
          "type": "number",
          "readOnly": true
        },
        "Sensor_Units": {
          "description": "Measurement Units Definition.",
          "x-label": "Sensor Units",
          "type": "string",
          "readOnly": true
        },
        "Min_Measured_Value": {
          "description": "The minimum value measured by the sensor since power ON or reset.",
          "x-label": "Min Measured Value",
```

```
          "type": "number",
          "readOnly": true
        },
        "Max_Measured_Value": {
          "description": "The maximum value measured by the sensor since power ON or reset.",
          "x-label": "Max Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Min_Range_Value": {
          "description": "The minimum value that can be measured by the sensor.",
          "x-label": "Min Range Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Range_Value": {
          "description": "The maximum value that can be measured by the sensor.",
          "x-label": "Max Range Value",
          "type": "number",
          "readOnly": true
        },
        "Current_Calibration": {
          "description": "Read or Write the current calibration coefficient.",
          "x-label": "Current Calibration",
          "type": "number"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
```



```
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Sensor_Value"
      ]
    }
  }
}
```

5.14.5 Property definition

Table 26 defines the Properties that are part of the "oic.r.o.concentration" Resource Type.

Table 26 – The Property definitions of the Resource with type "rt" = "oic.r.o.concentration".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Sensor_Value	number	Yes	Read Only	Last or Current Measured Value from the Sensor.
Sensor_Units	string	No	Read Only	Measurement Units Definition.
Min_Measured_Value	number	No	Read Only	The minimum value measured by the sensor since power ON or reset.
Max_Measured_Value	number	No	Read Only	The maximum value measured by the sensor since power ON or reset.
Min_Range_Value	number	No	Read Only	The minimum value that can be measured by the sensor.
Max_Range_Value	number	No	Read Only	The maximum value that can be measured by the sensor.
Current_Calibration	number	No	Read Write	Read or Write the current calibration coefficient.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second

				precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.14.6 CRUDN behaviour

Table 27 defines the CRUDN operations that are supported on the "oic.r.o.concentration" Resource Type.

Table 27 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.concentration".

Create	Read	Update	Delete	Notify
	get			observe

5.15 OMA/IPSO Conductivity (Object ID 3327)

5.15.1 Introduction

This IPSO object should be used to report a measurement of the electric conductivity of a medium or sample. It also provides resources for minimum and maximum measured values, as well as the minimum and maximum range that can be measured by the sensor. An example measurement unit is Siemens.

5.15.2 Example URI

/Omaipsoconductivityobjectid3327ResURI

5.15.3 Resource type

The Resource Type is defined as: "oic.r.o.conductivity".

5.15.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Conductivity (Object ID 3327)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsoconductivityobjectid3327ResURI": {
      "get": {
        "description": " This IPSO object should be used to report a measurement of the electric
conductivity of a medium or sample. It also provides resources for minimum and maximum measured
values, as well as the minimum and maximum range that can be measured by the sensor. An example
measurement unit is Siemens.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsoconductivityobjectid3327"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
```

```
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsoconductivityobjectid3327": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.conductivity"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Sensor_Value": {
          "description": "Last or Current Measured Value from the Sensor.",
          "x-label": "Sensor Value",
          "type": "number",
          "readOnly": true
        },
        "Sensor_Units": {
          "description": "Measurement Units Definition.",
          "x-label": "Sensor Units",
          "type": "string",
          "readOnly": true
        },
        "Min_Measured_Value": {
          "description": "The minimum value measured by the sensor since power ON or reset.",
          "x-label": "Min Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Measured_Value": {
          "description": "The maximum value measured by the sensor since power ON or reset.",
          "x-label": "Max Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Min_Range_Value": {
          "description": "The minimum value that can be measured by the sensor.",
          "x-label": "Min Range Value",
          "type": "number",
          "readOnly": true
        },
```

```
        "Max_Range_Value": {
          "description": "The maximum value that can be measured by the sensor.",
          "x-label": "Max Range Value",
          "type": "number",
          "readOnly": true
        },
        "Current_Calibration": {
          "description": "Read or Write the current calibration coefficient.",
          "x-label": "Current Calibration",
          "type": "number"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Sensor_Value"
      ]
    }
  }
}
```

5.15.5 Property definition

Table 28 defines the Properties that are part of the "oic.r.o.conductivity" Resource Type.

Table 28 – The Property definitions of the Resource with type "rt" = "oic.r.o.conductivity".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Sensor_Value	number	Yes	Read Only	Last or Current Measured Value from the Sensor.
Sensor_Units	string	No	Read Only	Measurement Units Definition.
Min_Measured_Value	number	No	Read Only	The minimum value measured by the sensor since power ON or reset.
Max_Measured_Value	number	No	Read Only	The maximum value measured by the sensor since power ON or reset.
Min_Range_Value	number	No	Read Only	The minimum value that can be measured by the sensor.
Max_Range_Value	number	No	Read Only	The maximum value that can be measured by the sensor.
Current_Calibration	number	No	Read Write	Read or Write the current calibration coefficient.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured

				value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.15.6 CRUDN behaviour

Table 29 defines the CRUDN operations that are supported on the "oic.r.o.conductivity" Resource Type.

Table 29 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.conductivity".

Create	Read	Update	Delete	Notify
	get			observe

5.16 OMA/IPSO Current (Object ID 3317)

5.16.1 Introduction

This IPSO object should be used with an ammeter to report measured electric current in amperes. It also provides resources for minimum and maximum measured values, as well as the minimum and maximum range that can be measured by the sensor. An example measurement unit is ampere.

5.16.2 Example URI

/Omaipsocurrentobjectid3317ResURI

5.16.3 Resource type

The Resource Type is defined as: "oic.r.o.current".

5.16.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Current (Object ID 3317)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsocurrentobjectid3317ResURI": {
      "get": {
        "description": " This IPSO object should be used with an ammeter to report measured electric
current in amperes. It also provides resources for minimum and maximum measured values, as well as
the minimum and maximum range that can be measured by the sensor. An example measurement unit is
ampere.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsocurrentobjectid3317"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsocurrentobjectid3317": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.current"
            ],
```

```
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Sensor_Value": {
          "description": "Last or Current Measured Value from the Sensor.",
          "x-label": "Sensor Value",
          "type": "number",
          "readOnly": true
        },
        "Sensor_Units": {
          "description": "Measurement Units Definition.",
          "x-label": "Sensor Units",
          "type": "string",
          "readOnly": true
        },
        "Min_Measured_Value": {
          "description": "The minimum value measured by the sensor since power ON or reset.",
          "x-label": "Min Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Measured_Value": {
          "description": "The maximum value measured by the sensor since power ON or reset.",
          "x-label": "Max Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Min_Range_Value": {
          "description": "The minimum value that can be measured by the sensor.",
          "x-label": "Min Range Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Range_Value": {
          "description": "The maximum value that can be measured by the sensor.",
          "x-label": "Max Range Value",
          "type": "number",
          "readOnly": true
        },
        "Current_Calibration": {
          "description": "Read or Write the current calibration coefficient.",
          "x-label": "Current Calibration",
          "type": "number"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
```

```
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Sensor_Value"
      ]
    }
  }
}
```

5.16.5 Property definition

Table 30 defines the Properties that are part of the "oic.r.o.current" Resource Type.

Table 30 – The Property definitions of the Resource with type "rt" = "oic.r.o.current".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.

Sensor_Value	number	Yes	Read Only	Last or Current Measured Value from the Sensor.
Sensor_Units	string	No	Read Only	Measurement Units Definition.
Min_Measured_Value	number	No	Read Only	The minimum value measured by the sensor since power ON or reset.
Max_Measured_Value	number	No	Read Only	The maximum value measured by the sensor since power ON or reset.
Min_Range_Value	number	No	Read Only	The minimum value that can be measured by the sensor.
Max_Range_Value	number	No	Read Only	The maximum value that can be measured by the sensor.
Current_Calibration	number	No	Read Write	Read or Write the current calibration coefficient.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future

				extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.16.6 CRUDN behaviour

Table 31 defines the CRUDN operations that are supported on the "oic.r.o.current" Resource Type.

Table 31 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.current".

Create	Read	Update	Delete	Notify
	get			observe

5.17 OMA/IPSO Depth (Object ID 3319)

5.17.1 Introduction

This IPSO object should be used to report depth measurements. It can, for example, be used to describe a generic rain gauge that measures the accumulated rainfall in millimetres (mm).

5.17.2 Example URI

/Omaipsodepthobjectid3319ResURI

5.17.3 Resource type

The Resource Type is defined as: "oic.r.o.depth".

5.17.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Depth (Object ID 3319)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
```

```
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsodepthobjectid3319ResURI": {
      "get": {
        "description": " This IPSO object should be used to report depth measurements. It can, for
example, be used to describe a generic rain gauge that measures the accumulated rainfall in
millimetres (mm).",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsodepthobjectid3319"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsodepthobjectid3319": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.depth"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
```

```
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Sensor_Value": {
          "description": "Last or Current Measured Value from the Sensor.",
          "x-label": "Sensor Value",
          "type": "number",
          "readOnly": true
        },
        "Sensor_Units": {
          "description": "Measurement Units Definition.",
          "x-label": "Sensor Units",
          "type": "string",
          "readOnly": true
        },
        "Min_Measured_Value": {
          "description": "The minimum value measured by the sensor since power ON or reset.",
          "x-label": "Min Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Measured_Value": {
          "description": "The maximum value measured by the sensor since power ON or reset.",
          "x-label": "Max Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Min_Range_Value": {
          "description": "The minimum value that can be measured by the sensor.",
          "x-label": "Min Range Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Range_Value": {
          "description": "The maximum value that can be measured by the sensor.",
          "x-label": "Max Range Value",
          "type": "number",
          "readOnly": true
        },
        "Current_Calibration": {
          "description": "Read or Write the current calibration coefficient.",
          "x-label": "Current Calibration",
          "type": "number"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
```

```
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Sensor_Value"
      ]
    }
  }
}
```

5.17.5 Property definition

Table 32 defines the Properties that are part of the "oic.r.o.depth" Resource Type.

Table 32 – The Property definitions of the Resource with type "rt" = "oic.r.o.depth".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Sensor_Value	number	Yes	Read Only	Last or Current Measured Value from the Sensor.
Sensor_Units	string	No	Read Only	Measurement Units Definition.
Min_Measured_Value	number	No	Read Only	The minimum value measured by the sensor since power ON or reset.
Max_Measured_Value	number	No	Read Only	The maximum value measured by the sensor since power ON or reset.
Min_Range_Value	number	No	Read Only	The minimum value that can be measured by the sensor.

Max_Range_Value	number	No	Read Only	The maximum value that can be measured by the sensor.
Current_Calibration	number	No	Read Write	Read or Write the current calibration coefficient.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality

				check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.17.6 CRUDN behaviour

Table 33 defines the CRUDN operations that are supported on the "oic.r.o.depth" Resource Type.

Table 33 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.depth".

Create	Read	Update	Delete	Notify
	get			observe

5.18 OMA/IPSO Digital Input (Object ID 3200)

5.18.1 Introduction

Generic digital input for non-specific sensors

5.18.2 Example URI

/Omaipsodigitalinputobjectid3200ResURI

5.18.3 Resource type

The Resource Type is defined as: "oic.r.o.digital.input".

5.18.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Digital Input (Object ID 3200)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsodigitalinputobjectid3200ResURI": {
      "get": {
        "description": " Generic digital input for non-specific sensors",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
```

```
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsodigitalinputobjectid3200"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsodigitalinputobjectid3200": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.digital.input"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Digital_Input_State": {
          "description": "The current state of a digital input.",
          "x-label": "Digital Input State",
          "type": "boolean",
          "readOnly": true
        },
        "Digital_Input_Counter": {
          "description": "The cumulative value of active state detected.",
          "x-label": "Digital Input Counter",
          "type": "integer",
          "readOnly": true
        },
        "Digital_Input_Polarity": {
          "description": "The polarity of the digital input as a Boolean (False = Normal, True =
Reversed).",
          "x-label": "Digital Input Polarity",
          "type": "boolean"
```

```
        },
        "Digital_Input_Debounce": {
          "description": "The debounce period in ms.",
          "x-label": "Digital Input Debounce",
          "type": "integer",
          "x-unit": "ms"
        },
        "Digital_Input_Edge_Selection": {
          "description": "The edge selection as an integer (1 = Falling edge, 2 = Rising edge, 3 =
Both Rising and Falling edge).",
          "x-label": "Digital Input Edge Selection",
          "maximum": 3,
          "minimum": 1,
          "type": "integer"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Sensor_Type": {
          "description": "The type of the sensor (for instance PIR type).",
          "x-label": "Sensor Type",
          "type": "string",
          "readOnly": true
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Digital_Input_State"
      ]
    }
  }
}
```

5.18.5 Property definition

Table 34 defines the Properties that are part of the "oic.r.o.digital.input" Resource Type.

Table 34 – The Property definitions of the Resource with type "rt" = "oic.r.o.digital.input".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.

Digital_Input_State	boolean	Yes	Read Only	The current state of a digital input.
Digital_Input_Counter	integer	No	Read Only	The cumulative value of active state detected.
Digital_Input_Polarity	boolean	No	Read Write	The polarity of the digital input as a Boolean (False = Normal, True = Reversed).
Digital_Input_Debounce	integer	No	Read Write	The debounce period in ms.
Digital_Input_Edge_Selection	integer	No	Read Write	The edge selection as an integer (1 = Falling edge, 2 = Rising edge, 3 = Both Rising and Falling edge).
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Sensor_Type	string	No	Read Only	The type of the sensor (for instance PIR type).
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).

5.18.6 CRUDN behaviour

Table 35 defines the CRUDN operations that are supported on the "oic.r.o.digital.input" Resource Type.

Table 35 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.digital.input".

Create	Read	Update	Delete	Notify
	get			observe

5.19 OMA/IPSO Digital Output (Object ID 3201)

5.19.1 Introduction

Generic digital output for non-specific actuators

5.19.2 Example URI

/Omaipsodigitaloutputobjectid3201ResURI

5.19.3 Resource type

The Resource Type is defined as: "oic.r.o.digital.output".

5.19.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Digital Output (Object ID 3201)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsodigitaloutputobjectid3201ResURI": {
      "get": {
        "description": " Generic digital output for non-specific actuators",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsodigitaloutputobjectid3201"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsodigitaloutputobjectid3201": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.digital.output"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
```

```
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Digital_Output_State": {
          "description": "The current state of a digital output.",
          "x-label": "Digital Output State",
          "type": "boolean"
        },
        "Digital_Output_Polarity": {
          "description": "The polarity of the digital output as a Boolean (False = Normal, True =
Reversed).",
          "x-label": "Digital Output Polarity",
          "type": "boolean"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Digital_Output_State"
      ]
    }
  }
}
```

5.19.5 Property definition

Table 36 defines the Properties that are part of the "oic.r.o.digital.output" Resource Type.

Table 36 – The Property definitions of the Resource with type "rt" = "oic.r.o.digital.output".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	

if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Digital_Output_State	boolean	Yes	Read Write	The current state of a digital output.
Digital_Output_Polarity	boolean	No	Read Write	The polarity of the digital output as a Boolean (False = Normal, True = Reversed).
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).

5.19.6 CRUDN behaviour

Table 37 defines the CRUDN operations that are supported on the "oic.r.o.digital.output" Resource Type.

Table 37 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.digital.output".

Create	Read	Update	Delete	Notify
	get			observe

5.20 OMA/IPSO Dimmer (Object ID 3343)

5.20.1 Introduction

This IPSO object should be used with a dimmer or level control to report the state of the control.

5.20.2 Example URI

/Omaipsodimmerobjectid3343ResURI

5.20.3 Resource type

The Resource Type is defined as: "oic.r.o.dimmer".

5.20.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Dimmer (Object ID 3343)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
```



```
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsodimmerobjectid3343ResURI": {
      "get": {
        "description": " This IPSO object should be used with a dimmer or level control to report
the state of the control.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsodimmerobjectid3343"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsodimmerobjectid3343": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.dimmer"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
```

```
        "Level": {
          "description": "Used to represent a level control such as audio volume.",
          "x-label": "Level",
          "maximum": 100,
          "minimum": 0,
          "type": "number",
          "x-unit": "/100"
        },
        "On_time": {
          "description": "The time in seconds that the device has been on. Writing a value of 0
resets the counter.",
          "x-label": "On time",
          "type": "integer",
          "x-unit": "s"
        },
        "Off_Time": {
          "description": "The time in seconds in the off state. Writing a value of 0 resets the
counter.",
          "x-label": "Off Time",
          "type": "integer",
          "x-unit": "s"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        }
      },
      "type": "object",
      "required": [
        "Level"
      ]
    }
  }
}
```

5.20.5 Property definition

Table 38 defines the Properties that are part of the "oic.r.o.dimmer" Resource Type.

Table 38 – The Property definitions of the Resource with type "rt" = "oic.r.o.dimmer".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Level	number	Yes	Read Write	Used to represent a level control such as audio volume.
On_time	integer	No	Read Write	The time in seconds that the device has been on. Writing a value of 0 resets the counter.
Off_Time	integer	No	Read Write	The time in seconds in the off state. Writing a value of 0 resets the counter.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string

				depending on the use case.

5.20.6 CRUDN behaviour

Table 39 defines the CRUDN operations that are supported on the "oic.r.o.dimmer" Resource Type.

Table 39 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.dimmer".

Create	Read	Update	Delete	Notify
	get			observe

5.21 OMA/IPSO Direction (Object ID 3332)

5.21.1 Introduction

This IPSO object is used to report the direction indicated by a compass, wind vane, or other directional indicator. The units of measure is plane angle degrees.

5.21.2 Example URI

/Omaipsodirectionobjectid3332ResURI

5.21.3 Resource type

The Resource Type is defined as: "oic.r.o.direction".

5.21.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Direction (Object ID 3332)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsodirectionobjectid3332ResURI": {
      "get": {
        "description": " This IPSO object is used to report the direction indicated by a compass,
wind vane, or other directional indicator. The units of measure is plane angle degrees.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsodirectionobjectid3332"
            }
          }
        }
      }
    }
  },
  "parameters": {
```

```
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsodirectionobjectid3332": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.direction"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Compass_Direction": {
          "description": "The measured compass direction.",
          "x-label": "Compass Direction",
          "maximum": 360,
          "minimum": 0,
          "type": "number",
          "x-unit": "deg",
          "readOnly": true
        },
        "Min_Measured_Value": {
          "description": "The minimum value measured by the sensor since power ON or reset.",
          "x-label": "Min Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Measured_Value": {
          "description": "The maximum value measured by the sensor since power ON or reset.",
          "x-label": "Max Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
```

```
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Compass_Direction"
      ]
    }
  }
}
```

5.21.5 Property definition

Table 40 defines the Properties that are part of the "oic.r.o.direction" Resource Type.

Table 40 – The Property definitions of the Resource with type "rt" = "oic.r.o.direction".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Compass_Direction	number	Yes	Read Only	The measured compass direction.

Min_Measured_Value	number	No	Read Only	The minimum value measured by the sensor since power ON or reset.
Max_Measured_Value	number	No	Read Only	The maximum value measured by the sensor since power ON or reset.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially

				passed quality check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.21.6 CRUDN behaviour

Table 41 defines the CRUDN operations that are supported on the "oic.r.o.direction" Resource Type.

Table 41 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.direction".

Create	Read	Update	Delete	Notify
	get			observe

5.22 OMA/IPSO Distance (Object ID 3330)

5.22.1 Introduction

This IPSO object should be used to report a distance measurement. It also provides resources for minimum and maximum measured values, as well as the minimum and maximum range that can be measured by the sensor. An example measurement unit is Meters.

5.22.2 Example URI

/Omaipsodistanceobjectid3330ResURI

5.22.3 Resource type

The Resource Type is defined as: "oic.r.o.distance".

5.22.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Distance (Object ID 3330)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsodistanceobjectid3330ResURI": {
      "get": {
        "description": " This IPSO object should be used to report a distance measurement. It also
provides resources for minimum and maximum measured values, as well as the minimum and maximum range
that can be measured by the sensor. An example measurement unit is Meters.",
```

```
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsodistanceobjectid3330"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsodistanceobjectid3330": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.distance"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Sensor_Value": {
          "description": "Last or Current Measured Value from the Sensor.",
          "x-label": "Sensor Value",
          "type": "number",
          "readOnly": true
        },
        "Sensor_Units": {
          "description": "Measurement Units Definition.",
          "x-label": "Sensor Units",
          "type": "string",
```

```
          "readOnly": true
        },
        "Min_Measured_Value": {
          "description": "The minimum value measured by the sensor since power ON or reset.",
          "x-label": "Min Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Measured_Value": {
          "description": "The maximum value measured by the sensor since power ON or reset.",
          "x-label": "Max Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Min_Range_Value": {
          "description": "The minimum value that can be measured by the sensor.",
          "x-label": "Min Range Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Range_Value": {
          "description": "The maximum value that can be measured by the sensor.",
          "x-label": "Max Range Value",
          "type": "number",
          "readOnly": true
        },
        "Current_Calibration": {
          "description": "Read or Write the current calibration coefficient.",
          "x-label": "Current Calibration",
          "type": "number"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
```

```
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Sensor_Value"
      ]
    }
  }
}
```

5.22.5 Property definition

Table 42 defines the Properties that are part of the "oic.r.o.distance" Resource Type.

Table 42 – The Property definitions of the Resource with type "rt" = "oic.r.o.distance".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Sensor_Value	number	Yes	Read Only	Last or Current Measured Value from the Sensor.
Sensor_Units	string	No	Read Only	Measurement Units Definition.
Min_Measured_Value	number	No	Read Only	The minimum value measured by the sensor since power ON or reset.
Max_Measured_Value	number	No	Read Only	The maximum value measured by the sensor since power ON or reset.
Min_Range_Value	number	No	Read Only	The minimum value that can be measured by the sensor.
Max_Range_Value	number	No	Read Only	The maximum value that can be measured by the sensor.
Current_Calibration	number	No	Read Write	Read or Write the current calibration coefficient.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the

				measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.22.6 CRUDN behaviour

Table 43 defines the CRUDN operations that are supported on the "oic.r.o.distance" Resource Type.

Table 43 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.distance".

Create	Read	Update	Delete	Notify
	get			observe

5.23 OMA/IPSO Energy (Object ID 3331)

5.23.1 Introduction

This IPSO object should be used to report energy consumption (Cumulative Power) of an electrical load. An example measurement unit is Watt Hours.

5.23.2 Example URI

/Omaipsoenergyobjectid3331ResURI

5.23.3 Resource type

The Resource Type is defined as: "oic.r.o.energy".

5.23.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Energy (Object ID 3331)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsoenergyobjectid3331ResURI": {
      "get": {
        "description": " This IPSO object should be used to report energy consumption (Cumulative
Power) of an electrical load. An example measurement unit is Watt Hours.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsoenergyobjectid3331"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
```

```
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsoenergyobjectid3331": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.energy"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Sensor_Value": {
          "description": "Last or Current Measured Value from the Sensor.",
          "x-label": "Sensor Value",
          "type": "number",
          "readOnly": true
        },
        "Sensor_Units": {
          "description": "Measurement Units Definition.",
          "x-label": "Sensor Units",
          "type": "string",
          "readOnly": true
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
```



```
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Sensor_Value"
      ]
    }
  }
}
```

5.23.5 Property definition

Table 44 defines the Properties that are part of the "oic.r.o.energy" Resource Type.

Table 44 – The Property definitions of the Resource with type "rt" = "oic.r.o.energy".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Sensor_Value	number	Yes	Read Only	Last or Current Measured Value from the Sensor.
Sensor_Units	string	No	Read Only	Measurement Units Definition.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.

Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement. When the quality level is 0 it means that the measurement

				should certainly be rejected.

5.23.6 CRUDN behaviour

Table 45 defines the CRUDN operations that are supported on the "oic.r.o.energy" Resource Type.

Table 45 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.energy".

Create	Read	Update	Delete	Notify
	get			observe

5.24 OMA/IPSO Frequency (Object ID 3318)

5.24.1 Introduction

This IPSO object should be used to report frequency measurements. It also provides resources for minimum and maximum measured values, as well as the minimum and maximum range that can be measured by the sensor. An example measurement unit is hertz.

5.24.2 Example URI

/Omaipsofrequencyobjectid3318ResURI

5.24.3 Resource type

The Resource Type is defined as: "oic.r.o.frequency".

5.24.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Frequency (Object ID 3318)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsofrequencyobjectid3318ResURI": {
      "get": {
        "description": " This IPSO object should be used to report frequency measurements. It also
provides resources for minimum and maximum measured values, as well as the minimum and maximum range
that can be measured by the sensor. An example measurement unit is hertz.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsofrequencyobjectid3318"
            }
          }
        }
      }
    }
  }
```

```
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsofrequencyobjectid3318": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.frequency"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Sensor_Value": {
          "description": "Last or Current Measured Value from the Sensor.",
          "x-label": "Sensor Value",
          "type": "number",
          "readOnly": true
        },
        "Sensor_Units": {
          "description": "Measurement Units Definition.",
          "x-label": "Sensor Units",
          "type": "string",
          "readOnly": true
        },
        "Min_Measured_Value": {
          "description": "The minimum value measured by the sensor since power ON or reset.",
          "x-label": "Min Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Measured_Value": {
          "description": "The maximum value measured by the sensor since power ON or reset.",
          "x-label": "Max Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Min_Range_Value": {
```

```
          "description": "The minimum value that can be measured by the sensor.",
          "x-label": "Min Range Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Range_Value": {
          "description": "The maximum value that can be measured by the sensor.",
          "x-label": "Max Range Value",
          "type": "number",
          "readOnly": true
        },
        "Current_Calibration": {
          "description": "Read or Write the current calibration coefficient.",
          "x-label": "Current Calibration",
          "type": "number"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Sensor_Value"
      ]
    }
  }
```

}

5.24.5 Property definition

Table 46 defines the Properties that are part of the "oic.r.o.frequency" Resource Type.

Table 46 – The Property definitions of the Resource with type "rt" = "oic.r.o.frequency".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Sensor_Value	number	Yes	Read Only	Last or Current Measured Value from the Sensor.
Sensor_Units	string	No	Read Only	Measurement Units Definition.
Min_Measured_Value	number	No	Read Only	The minimum value measured by the sensor since power ON or reset.
Max_Measured_Value	number	No	Read Only	The maximum value measured by the sensor since power ON or reset.
Min_Range_Value	number	No	Read Only	The minimum value that can be measured by the sensor.
Max_Range_Value	number	No	Read Only	The maximum value that can be measured by the sensor.
Current_Calibration	number	No	Read Write	Read or Write the current calibration coefficient.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No

				quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.24.6 CRUDN behaviour

Table 47 defines the CRUDN operations that are supported on the "oic.r.o.frequency" Resource Type.

Table 47 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.frequency".

Create	Read	Update	Delete	Notify
	get			observe

5.25 OMA/IPSO Generic Sensor (Object ID 3300)

5.25.1 Introduction

This IPSO object allows the description of a generic sensor. It is based on the description of a value and a unit according to the SenML specification. Thus, any type of value defined within this specification can be reported using this object. This object may be used as a generic object if a dedicated one does not exist.

5.25.2 Example URI

/Omaipsogenericsensorobjectid3300ResURI

5.25.3 Resource type

The Resource Type is defined as: "oic.r.o.generic.sensor".

5.25.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Generic Sensor (Object ID 3300)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsogenericsensorobjectid3300ResURI": {
      "get": {
        "description": " This IPSO object allows the description of a generic sensor. It is based on
the description of a value and a unit according to the SenML specification. Thus, any type of value
defined within this specification can be reported using this object. This object may be used as a
generic object if a dedicated one does not exist.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsogenericsensorobjectid3300"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
```

```
  },
  "definitions": {
    "Omaipsogenericsensorobjectid3300": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.generic.sensor"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Sensor_Value": {
          "description": "Last or Current Measured Value from the Sensor.",
          "x-label": "Sensor Value",
          "type": "number",
          "readOnly": true
        },
        "Sensor_Units": {
          "description": "Measurement Units Definition.",
          "x-label": "Sensor Units",
          "type": "string",
          "readOnly": true
        },
        "Min_Measured_Value": {
          "description": "The minimum value measured by the sensor since power ON or reset.",
          "x-label": "Min Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Measured_Value": {
          "description": "The maximum value measured by the sensor since power ON or reset.",
          "x-label": "Max Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Min_Range_Value": {
          "description": "The minimum value that can be measured by the sensor.",
          "x-label": "Min Range Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Range_Value": {
          "description": "The maximum value that can be measured by the sensor.",
          "x-label": "Max Range Value",
          "type": "number",
          "readOnly": true
        },
```

```
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Sensor_Type": {
          "description": "The type of the sensor (for instance PIR type).",
          "x-label": "Sensor Type",
          "type": "string",
          "readOnly": true
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Sensor_Value"
      ]
    }
  }
}
```

5.25.5 Property definition

Table 48 defines the Properties that are part of the "oic.r.o.generic.sensor" Resource Type.

Table 48 – The Property definitions of the Resource with type "rt" = "oic.r.o.generic.sensor".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Sensor_Value	number	Yes	Read Only	Last or Current Measured Value from the Sensor.
Sensor_Units	string	No	Read Only	Measurement Units Definition.
Min_Measured_Value	number	No	Read Only	The minimum value measured by the sensor since power ON or reset.
Max_Measured_Value	number	No	Read Only	The maximum value measured by the sensor since power ON or reset.
Min_Range_Value	number	No	Read Only	The minimum value that can be measured by the sensor.
Max_Range_Value	number	No	Read Only	The maximum value that can be measured by the sensor.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Sensor_Type	string	No	Read Only	The type of the sensor (for instance PIR type).
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED

				WITH CERTAINTY The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.25.6 CRUDN behaviour

Table 49 defines the CRUDN operations that are supported on the "oic.r.o.generic.sensor" Resource Type.

Table 49 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.generic.sensor".

Create	Read	Update	Delete	Notify
	get			observe

5.26 OMA/IPSO Gyrometer (Object ID 3334)

5.26.1 Introduction

This IPSO Object is used to report the current reading of a gyrometer sensor in 3 axes. It provides tracking of the minimum and maximum angular rate in all 3 axes. An example unit of measure is radians per second.

5.26.2 Example URI

/Omaipsogyrometerobjectid3334ResURI

5.26.3 Resource type

The Resource Type is defined as: "oic.r.o.gyrometer".

5.26.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Gyrometer (Object ID 3334)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsogyrometerobjectid3334ResURI": {
      "get": {
        "description": " This IPSO Object is used to report the current reading of a gyrometer
sensor in 3 axes. It provides tracking of the minimum and maximum angular rate in all 3 axes. An
example unit of measure is radians per second.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsogyrometerobjectid3334"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsogyrometerobjectid3334": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.gyrometer"
            ],
            "type": "string"
```

```
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "X_Value": {
          "description": "The measured value along the X axis.",
          "x-label": "X Value",
          "type": "number",
          "readOnly": true
        },
        "Y_Value": {
          "description": "The measured value along the Y axis.",
          "x-label": "Y Value",
          "type": "number",
          "readOnly": true
        },
        "Z_Value": {
          "description": "The measured value along the Z axis.",
          "x-label": "Z Value",
          "type": "number",
          "readOnly": true
        },
        "Sensor_Units": {
          "description": "Measurement Units Definition.",
          "x-label": "Sensor Units",
          "type": "string",
          "readOnly": true
        },
        "Min_X_Value": {
          "description": "The minimum measured value along the X axis.",
          "x-label": "Min X Value",
          "type": "number",
          "readOnly": true
        },
        "Max_X_Value": {
          "description": "The maximum measured value along the X axis.",
          "x-label": "Max X Value",
          "type": "number",
          "readOnly": true
        },
        "Min_Y_Value": {
          "description": "The minimum measured value along the Y axis.",
          "x-label": "Min Y Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Y_Value": {
          "description": "The maximum measured value along the Y axis.",
          "x-label": "Max Y Value",
          "type": "number",
          "readOnly": true
```

```
        },
        "Min_Z_Value": {
          "description": "The minimum measured value along the Z axis.",
          "x-label": "Min Z Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Z_Value": {
          "description": "The maximum measured value along the Z axis.",
          "x-label": "Max Z Value",
          "type": "number",
          "readOnly": true
        },
        "Min_Range_Value": {
          "description": "The minimum value that can be measured by the sensor.",
          "x-label": "Min Range Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Range_Value": {
          "description": "The maximum value that can be measured by the sensor.",
          "x-label": "Max Range Value",
          "type": "number",
          "readOnly": true
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
```

```
        }
      },
      "type": "object",
      "required": [
        "X_Value"
      ]
    }
  }
}
```

5.26.5 Property definition

Table 50 defines the Properties that are part of the "oic.r.o.gyrometer" Resource Type.

Table 50 – The Property definitions of the Resource with type "rt" = "oic.r.o.gyrometer".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
X_Value	number	Yes	Read Only	The measured value along the X axis.
Y_Value	number	No	Read Only	The measured value along the Y axis.
Z_Value	number	No	Read Only	The measured value along the Z axis.
Sensor_Units	string	No	Read Only	Measurement Units Definition.
Min_X_Value	number	No	Read Only	The minimum measured value along the X axis.
Max_X_Value	number	No	Read Only	The maximum measured value along the X axis.
Min_Y_Value	number	No	Read Only	The minimum measured value along the Y axis.
Max_Y_Value	number	No	Read Only	The maximum measured value along the Y axis.
Min_Z_Value	number	No	Read Only	The minimum measured value along the Z axis.
Max_Z_Value	number	No	Read Only	The maximum measured value along the Z axis.
Min_Range_Value	number	No	Read Only	The minimum value that can be measured by the sensor.
Max_Range_Value	number	No	Read Only	The maximum value that can be

				measured by the sensor.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by the application

				when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.26.6 CRUDN behaviour

Table 51 defines the CRUDN operations that are supported on the "oic.r.o.gyrometer" Resource Type.

Table 51 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.gyrometer".

Create	Read	Update	Delete	Notify
	get			observe

5.27 OMA/IPSO Humidity (Object ID 3304)

5.27.1 Introduction

This IPSO object should be used with a humidity sensor to report a humidity measurement. It also provides resources for minimum/maximum measured values and the minimum/maximum range that can be measured by the humidity sensor. An example measurement unit is relative humidity as a percentage.

5.27.2 Example URI

/Omaipsohumidityobjectid3304ResURI

5.27.3 Resource type

The Resource Type is defined as: "oic.r.o.humidity".

5.27.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Humidity (Object ID 3304)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsohumidityobjectid3304ResURI": {
      "get": {
        "description": " This IPSO object should be used with a humidity sensor to report a humidity
measurement.  It also provides resources for minimum/maximum measured values and the minimum/maximum
range that can be measured by the humidity sensor. An example measurement unit is relative humidity
as a percentage.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
```

```
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsohumidityobjectid3304"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsohumidityobjectid3304": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.humidity"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Sensor_Value": {
          "description": "Last or Current Measured Value from the Sensor.",
          "x-label": "Sensor Value",
          "type": "number",
          "readOnly": true
        },
        "Min_Measured_Value": {
          "description": "The minimum value measured by the sensor since power ON or reset.",
          "x-label": "Min Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Measured_Value": {
          "description": "The maximum value measured by the sensor since power ON or reset.",
          "x-label": "Max Measured Value",
```

```
          "type": "number",
          "readOnly": true
        },
        "Min_Range_Value": {
          "description": "The minimum value that can be measured by the sensor.",
          "x-label": "Min Range Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Range_Value": {
          "description": "The maximum value that can be measured by the sensor.",
          "x-label": "Max Range Value",
          "type": "number",
          "readOnly": true
        },
        "Sensor_Units": {
          "description": "Measurement Units Definition.",
          "x-label": "Sensor Units",
          "type": "string",
          "readOnly": true
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
```

```
        "Sensor_Value"
      ]
    }
  }
}
```

5.27.5 Property definition

Table 52 defines the Properties that are part of the "oic.r.o.humidity" Resource Type.

Table 52 – The Property definitions of the Resource with type "rt" = "oic.r.o.humidity".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Sensor_Value	number	Yes	Read Only	Last or Current Measured Value from the Sensor.
Min_Measured_Value	number	No	Read Only	The minimum value measured by the sensor since power ON or reset.
Max_Measured_Value	number	No	Read Only	The maximum value measured by the sensor since power ON or reset.
Min_Range_Value	number	No	Read Only	The minimum value that can be measured by the sensor.
Max_Range_Value	number	No	Read Only	The maximum value that can be measured by the sensor.
Sensor_Units	string	No	Read Only	Measurement Units Definition.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No

				quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.27.6 CRUDN behaviour

Table 53 defines the CRUDN operations that are supported on the "oic.r.o.humidity" Resource Type.

Table 53 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.humidity".

Create	Read	Update	Delete	Notify
	get			observe

5.28 OMA/IPSO Illuminance (Object ID 3301)

5.28.1 Introduction

Illuminance sensor, example units = lx

5.28.2 Example URI

/Omaipsoilluminanceobjectid3301ResURI

5.28.3 Resource type

The Resource Type is defined as: "oic.r.o.illuminance".

5.28.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Illuminance (Object ID 3301)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsoilluminanceobjectid3301ResURI": {
      "get": {
        "description": " Illuminance sensor, example units = lx",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsoilluminanceobjectid3301"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsoilluminanceobjectid3301": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
```

```
            "enum": [
              "oic.r.o.illuminance"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Sensor_Value": {
          "description": "Last or Current Measured Value from the Sensor.",
          "x-label": "Sensor Value",
          "type": "number",
          "readOnly": true
        },
        "Min_Measured_Value": {
          "description": "The minimum value measured by the sensor since power ON or reset.",
          "x-label": "Min Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Measured_Value": {
          "description": "The maximum value measured by the sensor since power ON or reset.",
          "x-label": "Max Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Min_Range_Value": {
          "description": "The minimum value that can be measured by the sensor.",
          "x-label": "Min Range Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Range_Value": {
          "description": "The maximum value that can be measured by the sensor.",
          "x-label": "Max Range Value",
          "type": "number",
          "readOnly": true
        },
        "Sensor_Units": {
          "description": "Measurement Units Definition.",
          "x-label": "Sensor Units",
          "type": "string",
          "readOnly": true
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
```

```
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Sensor_Value"
      ]
    }
  }
}
```

5.28.5 Property definition

Table 54 defines the Properties that are part of the "oic.r.o.illuminance" Resource Type.

Table 54 – The Property definitions of the Resource with type "rt" = "oic.r.o.illuminance".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Sensor_Value	number	Yes	Read Only	Last or Current Measured Value from the Sensor.

Min_Measured_Value	number	No	Read Only	The minimum value measured by the sensor since power ON or reset.
Max_Measured_Value	number	No	Read Only	The maximum value measured by the sensor since power ON or reset.
Min_Range_Value	number	No	Read Only	The minimum value that can be measured by the sensor.
Max_Range_Value	number	No	Read Only	The maximum value that can be measured by the sensor.
Sensor_Units	string	No	Read Only	Measurement Units Definition.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level

				reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.28.6 CRUDN behaviour

Table 55 defines the CRUDN operations that are supported on the "oic.r.o.illuminance" Resource Type.

Table 55 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.illuminance".

Create	Read	Update	Delete	Notify
	get			observe

5.29 OMA/IPSO Light Control (Object ID 3311)

5.29.1 Introduction

This Object is used to control a light source, such as a LED or other light. It allows a light to be turned on or off and its dimmer setting to be control as a % between 0 and 100. An optional colour setting enables a string to be used to indicate the desired colour.

5.29.2 Example URI

/Omaipsolightcontrolobjectid3311ResURI

5.29.3 Resource type

The Resource Type is defined as: "oic.r.o.light.control".

5.29.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Light Control (Object ID 3311)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
```

```
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsolightcontrolobjectid3311ResURI": {
      "get": {
        "description": " This Object is used to control a light source, such as a LED or other
light.  It allows a light to be turned on or off and its dimmer setting to be control as a % between
0 and 100. An optional colour setting enables a string to be used to indicate the desired colour.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsolightcontrolobjectid3311"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsolightcontrolobjectid3311": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.light.control"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
```

```
          "readOnly": true,
          "type": "array"
        },
        "On_Off": {
          "description": "On/off control. Boolean value where True is On and False is Off.",
          "x-label": "On/Off",
          "type": "boolean"
        },
        "Dimmer": {
          "description": "This resource represents a dimmer setting, which has an Integer value
between 0 and 100 as a percentage.",
          "x-label": "Dimmer",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "x-unit": "/100"
        },
        "On_time": {
          "description": "The time in seconds that the device has been on. Writing a value of 0
resets the counter.",
          "x-label": "On time",
          "type": "integer",
          "x-unit": "s"
        },
        "Cumulative_active_power": {
          "description": "The cumulative active power since the last cumulative energy reset or
device start.",
          "x-label": "Cumulative active power",
          "type": "number",
          "x-unit": "Wh",
          "readOnly": true
        },
        "Power_factor": {
          "description": "If applicable, the power factor of the current consumption.",
          "x-label": "Power factor",
          "type": "number",
          "readOnly": true
        },
        "Colour": {
          "description": "A string representing a value in some color space.",
          "x-label": "Colour",
          "type": "string"
        },
        "Sensor_Units": {
          "description": "Measurement Units Definition.",
          "x-label": "Sensor Units",
          "type": "string",
          "readOnly": true
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        }
      },
      "type": "object",
      "required": [
        "On_Off"
      ]
    }
  }
}
```

5.29.5 Property definition

Table 56 defines the Properties that are part of the "oic.r.o.light.control" Resource Type.

Table 56 – The Property definitions of the Resource with type "rt" = "oic.r.o.light.control".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
On_Off	boolean	Yes	Read Write	On/off control. Boolean value where True is On and False is Off.
Dimmer	integer	No	Read Write	This resource represents a dimmer setting, which has an Integer value between 0 and 100 as a percentage.
On_time	integer	No	Read Write	The time in seconds that the device has been on. Writing a value of 0 resets the counter.
Cumulative_active_power	number	No	Read Only	The cumulative active power since the last cumulative energy reset or device start.
Power_factor	number	No	Read Only	If applicable, the power factor of the current consumption.
Colour	string	No	Read Write	A string representing a value in some color space.
Sensor_Units	string	No	Read Only	Measurement Units Definition.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.

5.29.6 CRUDN behaviour

Table 57 defines the CRUDN operations that are supported on the "oic.r.o.light.control" Resource Type.

Table 57 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.light.control".

Create	Read	Update	Delete	Notify
	get			observe

5.30 OMA/IPSO Load (Object ID 3322)

5.30.1 Introduction

This IPSO object should be used with a load sensor (as in a scale) to report the applied weight or force. It also provides resources for minimum and maximum measured values, as well as the minimum and maximum range that can be measured by the sensor. An example measurement unit is kilograms.

5.30.2 Example URI

/Omaipsoloadobjectid3322ResURI

5.30.3 Resource type

The Resource Type is defined as: "oic.r.o.load".

5.30.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Load (Object ID 3322)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsoloadobjectid3322ResURI": {
      "get": {
        "description": " This IPSO object should be used with a load sensor (as in a scale) to
report the applied weight or force. It also provides resources for minimum and maximum measured
values, as well as the minimum and maximum range that can be measured by the sensor. An example
measurement unit is kilograms.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsoloadobjectid3322"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
```

```
  },
  "definitions": {
    "Omaipsoloadobjectid3322": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.load"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Sensor_Value": {
          "description": "Last or Current Measured Value from the Sensor.",
          "x-label": "Sensor Value",
          "type": "number",
          "readOnly": true
        },
        "Sensor_Units": {
          "description": "Measurement Units Definition.",
          "x-label": "Sensor Units",
          "type": "string",
          "readOnly": true
        },
        "Min_Measured_Value": {
          "description": "The minimum value measured by the sensor since power ON or reset.",
          "x-label": "Min Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Measured_Value": {
          "description": "The maximum value measured by the sensor since power ON or reset.",
          "x-label": "Max Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Min_Range_Value": {
          "description": "The minimum value that can be measured by the sensor.",
          "x-label": "Min Range Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Range_Value": {
          "description": "The maximum value that can be measured by the sensor.",
          "x-label": "Max Range Value",
          "type": "number",
          "readOnly": true
        },
```

```
        "Current_Calibration": {
          "description": "Read or Write the current calibration coefficient.",
          "x-label": "Current Calibration",
          "type": "number"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Sensor_Value"
      ]
    }
  }
}
```

5.30.5 Property definition

Table 58 defines the Properties that are part of the "oic.r.o.load" Resource Type.

Table 58 – The Property definitions of the Resource with type "rt" = "oic.r.o.load".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Sensor_Value	number	Yes	Read Only	Last or Current Measured Value from the Sensor.
Sensor_Units	string	No	Read Only	Measurement Units Definition.
Min_Measured_Value	number	No	Read Only	The minimum value measured by the sensor since power ON or reset.
Max_Measured_Value	number	No	Read Only	The maximum value measured by the sensor since power ON or reset.
Min_Range_Value	number	No	Read Only	The minimum value that can be measured by the sensor.
Max_Range_Value	number	No	Read Only	The maximum value that can be measured by the sensor.
Current_Calibration	number	No	Read Write	Read or Write the current calibration coefficient.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured

				value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.30.6 CRUDN behaviour

Table 59 defines the CRUDN operations that are supported on the "oic.r.o.load" Resource Type.

Table 59 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.load".

Create	Read	Update	Delete	Notify
	get			observe

5.31 OMA/IPSO Load Control (Object ID 3310)

5.31.1 Introduction

This Object is used for demand-response load control and other load control in automation application (not limited to power).

5.31.2 Example URI

/Omaipsoloadcontrolobjectid3310ResURI

5.31.3 Resource type

The Resource Type is defined as: "oic.r.o.load.control".

5.31.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Load Control (Object ID 3310)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsoloadcontrolobjectid3310ResURI": {
      "get": {
        "description": " This Object is used for demand-response load control and other load control
in automation application (not limited to power).",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsoloadcontrolobjectid3310"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsoloadcontrolobjectid3310": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.load.control"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
```

```
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Event_Identifier": {
          "description": "The event identifier as a string.",
          "x-label": "Event Identifier",
          "type": "string"
        },
        "Start_Time": {
          "description": "Time when the event started.",
          "x-label": "Start Time",
          "x-sdfType": "unix-time",
          "type": "number"
        },
        "Duration_In_Min": {
          "description": "The duration of the event in minutes.",
          "x-label": "Duration In Min",
          "type": "integer",
          "x-unit": "min"
        },
        "Criticality_Level": {
          "description": "The criticality of the event. The device receiving the event will react in
an appropriate fashion for the device.",
          "x-label": "Criticality Level",
          "maximum": 3,
          "minimum": 0,
          "type": "integer"
        },
        "Avg_Load_AdjPct": {
          "description": "Defines the maximum energy usage of the receiving device, as a percentage
of the device's normal maximum energy usage.",
          "x-label": "Avg Load AdjPct",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "x-unit": "/100"
        },
        "Duty_Cycle": {
          "description": "Defines the duty cycle for the load control event, i.e, what percentage of
time the receiving device is allowed to be on.",
          "x-label": "Duty Cycle",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "x-unit": "/100"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
```

```
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Event_Identifier",
        "Start_Time",
        "Duration_In_Min"
      ]
    }
  }
}
```

5.31.5 Property definition

Table 60 defines the Properties that are part of the "oic.r.o.load.control" Resource Type.

Table 60 – The Property definitions of the Resource with type "rt" = "oic.r.o.load.control".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Event_Identifier	string	Yes	Read Write	The event identifier as a string.
Start_Time	number	Yes	Read Write	Time when the event started.
Duration_In_Min	integer	Yes	Read Write	The duration of the event in minutes.
Criticality_Level	integer	No	Read Write	The criticality of the event. The device receiving the event will react in an appropriate fashion for the device.
Avg_Load_AdjPct	integer	No	Read Write	Defines the maximum energy usage of the receiving device, as a percentage of the device's normal maximum energy usage.
Duty_Cycle	integer	No	Read Write	Defines the duty cycle for the load control event, i.e, what percentage of time the receiving

				device is allowed to be on.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).

5.31.6 CRUDN behaviour

Table 61 defines the CRUDN operations that are supported on the "oic.r.o.load.control" Resource Type.

Table 61 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.load.control".

Create	Read	Update	Delete	Notify
	get			observe

5.32 OMA/IPSO Location (Object ID 3336)

5.32.1 Introduction

This IPSO object represents GPS coordinates. This object is compatible with the LwM2M management object for location, but uses reusable resources.

5.32.2 Example URI

/Omaipsolocationobjectid3336ResURI

5.32.3 Resource type

The Resource Type is defined as: "oic.r.o.location".

5.32.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Location (Object ID 3336)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2021 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsolocationobjectid3336ResURI": {
      "get": {
```

```
        "description": " This IPSO object represents GPS coordinates. This object is compatible with
the LwM2M management object for location, but uses reusable resources.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsolocationobjectid3336"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsolocationobjectid3336": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.location"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Numeric_Latitude": {
          "description": "The decimal notation of latitude, e.g. -43.5723 (World Geodetic System
1984).",
          "x-label": "Numeric Latitude",
          "type": "number",
          "x-unit": "lat",
          "readOnly": true
        },
```

```
        "Numeric_Longitude": {
          "description": "The decimal notation of longitude, e.g. 153.21760 (World Geodetic System
1984).",
          "x-label": "Numeric Longitude",
          "type": "number",
          "x-unit": "lon",
          "readOnly": true
        },
        "Numeric_Uncertainty": {
          "description": "The accuracy of the position in meters.",
          "x-label": "Numeric Uncertainty",
          "type": "number",
          "x-unit": "m",
          "readOnly": true
        },
        "Compass_Direction": {
          "description": "The measured compass direction.",
          "x-label": "Compass Direction",
          "maximum": 360,
          "minimum": 0,
          "type": "number",
          "x-unit": "deg",
          "readOnly": true
        },
        "Velocity": {
          "description": "The velocity of the device as defined in 3GPP 23.032 GAD specification.
This set of values may not be available if the device is static.",
          "x-label": "Velocity",
          "x-sdfType": "byte-string",
          "type": "string",
          "readOnly": true
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
```

```
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Numeric_Latitude",
        "Numeric_Longitude"
      ]
    }
  }
}
```

5.32.5 Property definition

Table 62 defines the Properties that are part of the "oic.r.o.location" Resource Type.

Table 62 – The Property definitions of the Resource with type "rt" = "oic.r.o.location".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Numeric_Latitude	number	Yes	Read Only	The decimal notation of latitude, e.g. -43.5723 (World Geodetic System 1984).
Numeric_Longitude	number	Yes	Read Only	The decimal notation of longitude, e.g. 153.21760 (World Geodetic System 1984).
Numeric_Uncertainty	number	No	Read Only	The accuracy of the position in meters.
Compass_Direction	number	No	Read Only	The measured compass direction.
Velocity	string	No	Read Only	The velocity of the device as defined in 3GPP 23.032 GAD specification. This set of values may not be available if the device is static.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a

				string depending on the use case.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.32.6 CRUDN behaviour

Table 63 defines the CRUDN operations that are supported on the "oic.r.o.location" Resource Type.

Table 63 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.location".

Create	Read	Update	Delete	Notify
	get			observe

5.33 OMA/IPSO Loudness (Object ID 3324)

5.33.1 Introduction

This IPSO object should be used to report loudness or noise level measurements. It also provides resources for minimum and maximum measured values, as well as the minimum and maximum range that can be measured by the sensor. An example measurement unit is decibels.

5.33.2 Example URI

/Omaipsoloudnessobjectid3324ResURI

5.33.3 Resource type

The Resource Type is defined as: "oic.r.o.loudness".

5.33.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Loudness (Object ID 3324)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsoloudnessobjectid3324ResURI": {
      "get": {
        "description": " This IPSO object should be used to report loudness or noise level
measurements. It also provides resources for minimum and maximum measured values, as well as the
minimum and maximum range that can be measured by the sensor. An example measurement unit is
decibels.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsoloudnessobjectid3324"
            }
          }
        }
      }
    }
  },
  "parameters": {
```

```
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsoloudnessobjectid3324": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.loudness"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Sensor_Value": {
          "description": "Last or Current Measured Value from the Sensor.",
          "x-label": "Sensor Value",
          "type": "number",
          "readOnly": true
        },
        "Sensor_Units": {
          "description": "Measurement Units Definition.",
          "x-label": "Sensor Units",
          "type": "string",
          "readOnly": true
        },
        "Min_Measured_Value": {
          "description": "The minimum value measured by the sensor since power ON or reset.",
          "x-label": "Min Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Measured_Value": {
          "description": "The maximum value measured by the sensor since power ON or reset.",
          "x-label": "Max Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Min_Range_Value": {
          "description": "The minimum value that can be measured by the sensor.",
          "x-label": "Min Range Value",
```

```
          "type": "number",
          "readOnly": true
        },
        "Max_Range_Value": {
          "description": "The maximum value that can be measured by the sensor.",
          "x-label": "Max Range Value",
          "type": "number",
          "readOnly": true
        },
        "Current_Calibration": {
          "description": "Read or Write the current calibration coefficient.",
          "x-label": "Current Calibration",
          "type": "number"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Sensor_Value"
      ]
    }
  }
}
```

5.33.5 Property definition

Table 64 defines the Properties that are part of the "oic.r.o.loudness" Resource Type.

Table 64 – The Property definitions of the Resource with type "rt" = "oic.r.o.loudness".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Sensor_Value	number	Yes	Read Only	Last or Current Measured Value from the Sensor.
Sensor_Units	string	No	Read Only	Measurement Units Definition.
Min_Measured_Value	number	No	Read Only	The minimum value measured by the sensor since power ON or reset.
Max_Measured_Value	number	No	Read Only	The maximum value measured by the sensor since power ON or reset.
Min_Range_Value	number	No	Read Only	The minimum value that can be measured by the sensor.
Max_Range_Value	number	No	Read Only	The maximum value that can be measured by the sensor.
Current_Calibration	number	No	Read Write	Read or Write the current calibration coefficient.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because

				they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.33.6 CRUDN behaviour

Table 65 defines the CRUDN operations that are supported on the "oic.r.o.loudness" Resource Type.

Table 65 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.loudness".

Create	Read	Update	Delete	Notify
	get			observe

5.34 OMA/IPSO Magnetometer (Object ID 3314)

5.34.1 Introduction

This IPSO object can be used to represent a 1-3 axis magnetometer with optional compass direction.

5.34.2 Example URI

/Omaipsomagnetometerobjectid3314ResURI

5.34.3 Resource type

The Resource Type is defined as: "oic.r.o.magnetometer".

5.34.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Magnetometer (Object ID 3314)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsomagnetometerobjectid3314ResURI": {
      "get": {
        "description": " This IPSO object can be used to represent a 1-3 axis magnetometer with
optional compass direction.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsomagnetometerobjectid3314"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsomagnetometerobjectid3314": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.magnetometer"
            ],
            "type": "string"
          },
```

```
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "X_Value": {
          "description": "The measured value along the X axis.",
          "x-label": "X Value",
          "type": "number",
          "readOnly": true
        },
        "Y_Value": {
          "description": "The measured value along the Y axis.",
          "x-label": "Y Value",
          "type": "number",
          "readOnly": true
        },
        "Z_Value": {
          "description": "The measured value along the Z axis.",
          "x-label": "Z Value",
          "type": "number",
          "readOnly": true
        },
        "Compass_Direction": {
          "description": "The measured compass direction.",
          "x-label": "Compass Direction",
          "maximum": 360,
          "minimum": 0,
          "type": "number",
          "x-unit": "deg",
          "readOnly": true
        },
        "Sensor_Units": {
          "description": "Measurement Units Definition.",
          "x-label": "Sensor Units",
          "type": "string",
          "readOnly": true
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
```

```
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "X_Value"
      ]
    }
  }
}
```

5.34.5 Property definition

Table 66 defines the Properties that are part of the "oic.r.o.magnetometer" Resource Type.

Table 66 – The Property definitions of the Resource with type "rt" = "oic.r.o.magnetometer".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
X_Value	number	Yes	Read Only	The measured value along the X axis.
Y_Value	number	No	Read Only	The measured value along the Y axis.
Z_Value	number	No	Read Only	The measured value along the Z axis.

Compass_Direction	number	No	Read Only	The measured compass direction.
Sensor_Units	string	No	Read Only	Measurement Units Definition.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the

				more caution should be used by the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.34.6 CRUDN behaviour

Table 67 defines the CRUDN operations that are supported on the "oic.r.o.magnetometer" Resource Type.

Table 67 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.magnetometer".

Create	Read	Update	Delete	Notify
	get			observe

5.35 OMA/IPSO Multiple Axis Joystick (Object ID 3345)

5.35.1 Introduction

This IPSO object can be used to report the position of a shuttle or joystick control. A digital input is provided to report the state of an associated push button.

5.35.2 Example URI

/Omaipsomultipleaxisjoystickobjectid3345ResURI

5.35.3 Resource type

The Resource Type is defined as: "oic.r.o.multiple.axis.joystick".

5.35.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Multiple Axis Joystick (Object ID 3345)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsomultipleaxisjoystickobjectid3345ResURI": {
      "get": {
        "description": " This IPSO object can be used to report the position of a shuttle or
joystick control. A digital input is provided to report the state of an associated push button.",
       "parameters": [
         {
           "$ref": "#/parameters/interface"
         }
       ],
       "responses": {
         "200": {
```

```
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsomultipleaxisjoystickobjectid3345"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsomultipleaxisjoystickobjectid3345": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.multiple.axis.joystick"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Digital_Input_State": {
          "description": "The current state of a digital input.",
          "x-label": "Digital Input State",
          "type": "boolean",
          "readOnly": true
        },
        "Digital_Input_Counter": {
          "description": "The cumulative value of active state detected.",
          "x-label": "Digital Input Counter",
          "type": "integer",
          "readOnly": true
        },
        "X_Value": {
          "description": "The measured value along the X axis.",
          "x-label": "X Value",
          "type": "number",
          "readOnly": true
```

```
        },
        "Y_Value": {
          "description": "The measured value along the Y axis.",
          "x-label": "Y Value",
          "type": "number",
          "readOnly": true
        },
        "Z_Value": {
          "description": "The measured value along the Z axis.",
          "x-label": "Z Value",
          "type": "number",
          "readOnly": true
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        }
      },
      "type": "object"
    }
  }
}
```

5.35.5 Property definition

Table 68 defines the Properties that are part of the "oic.r.o.multiple.axis.joystick" Resource Type.

Table 68 – The Property definitions of the Resource with type "rt" = "oic.r.o.multiple.axis.joystick".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema		Read Only	The Resource Type.
n	multiple types: see schema		Read Write	
if	array: see schema		Read Only	The OCF Interface set supported by this Resource.
Digital_Input_State	boolean		Read Only	The current state of a digital input.
Digital_Input_Counter	integer		Read Only	The cumulative value of active state detected.
X_Value	number		Read Only	The measured value along the X axis.
Y_Value	number		Read Only	The measured value along the Y axis.
Z_Value	number		Read Only	The measured value along the Z axis.
Application_Type	string		Read Write	The application type of the sensor or actuator as a string depending on the use case.

5.35.6 CRUDN behaviour

Table 69 defines the CRUDN operations that are supported on the "oic.r.o.multiple.axis.joystick" Resource Type.

Table 69 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.multiple.axis.joystick".

Create	Read	Update	Delete	Notify
	get			observe

5.36 OMA/IPSO Multi-state Selector (Object ID 3348)

5.36.1 Introduction

This IPSO object is used to represent the state of a Multi-state selector switch with a number of fixed positions.

5.36.2 Example URI

/Omaipsomultistateselectorobjectid3348ResURI

5.36.3 Resource type

The Resource Type is defined as: "oic.r.o.multi-state.selector".

5.36.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Multi-state Selector (Object ID 3348)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsomultistateselectorobjectid3348ResURI": {
      "get": {
        "description": " This IPSO object is used to represent the state of a Multi-state selector
switch with a number of fixed positions.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsomultistateselectorobjectid3348"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
```

```
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsomultistateselectorobjectid3348": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.multi-state.selector"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Multi-state_Input": {
          "description": "The current state of a Multi-state input or selector.",
          "x-label": "Multi-state Input",
          "type": "integer",
          "readOnly": true
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Multi-state_Input"
```

```
      ]
    }
  }
}
```

5.36.5 Property definition

Table 70 defines the Properties that are part of the "oic.r.o.multi-state.selector" Resource Type.

Table 70 – The Property definitions of the Resource with type "rt" = "oic.r.o.multi-state.selector".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Multi-state_Input	integer	Yes	Read Only	The current state of a Multi-state input or selector.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).

5.36.6 CRUDN behaviour

Table 71 defines the CRUDN operations that are supported on the "oic.r.o.multi-state.selector" Resource Type.

Table 71 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.multi-state.selector".

Create	Read	Update	Delete	Notify
	get			observe

5.37 OMA/IPSO On/Off switch (Object ID 3342)

5.37.1 Introduction

This IPSO object should be used with an On/Off switch to report the state of the switch.

5.37.2 Example URI

/Omaipsoonoffswitchobjectid3342ResURI

5.37.3 Resource type

The Resource Type is defined as: "oic.r.o.on.off.switch".

5.37.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO On/Off switch (Object ID 3342)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsoonoffswitchobjectid3342ResURI": {
      "get": {
        "description": " This IPSO object should be used with an On/Off switch to report the state
of the switch.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsoonoffswitchobjectid3342"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsoonoffswitchobjectid3342": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.on.off.switch"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
```

```
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Digital_Input_State": {
          "description": "The current state of a digital input.",
          "x-label": "Digital Input State",
          "type": "boolean",
          "readOnly": true
        },
        "Digital_Input_Counter": {
          "description": "The cumulative value of active state detected.",
          "x-label": "Digital Input Counter",
          "type": "integer",
          "readOnly": true
        },
        "On_time": {
          "description": "The time in seconds that the device has been on. Writing a value of 0
resets the counter.",
          "x-label": "On time",
          "type": "integer",
          "x-unit": "s"
        },
        "Off_Time": {
          "description": "The time in seconds in the off state. Writing a value of 0 resets the
counter.",
          "x-label": "Off Time",
          "type": "integer",
          "x-unit": "s"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Digital_Input_State"
      ]
    }
  }
```

}

5.37.5 Property definition

Table 72 defines the Properties that are part of the "oic.r.o.on.off.switch" Resource Type.

Table 72 – The Property definitions of the Resource with type "rt" = "oic.r.o.on.off.switch".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Digital_Input_State	boolean	Yes	Read Only	The current state of a digital input.
Digital_Input_Counter	integer	No	Read Only	The cumulative value of active state detected.
On_time	integer	No	Read Write	The time in seconds that the device has been on. Writing a value of 0 resets the counter.
Off_Time	integer	No	Read Write	The time in seconds in the off state. Writing a value of 0 resets the counter.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).

5.37.6 CRUDN behaviour

Table 73 defines the CRUDN operations that are supported on the "oic.r.o.on.off.switch" Resource Type.

Table 73 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.on.off.switch".

Create	Read	Update	Delete	Notify
	get			observe

5.38 OMA/IPSO Percentage (Object ID 3320)

5.38.1 Introduction

This IPSO object should can be used to report measurements relative to a 0-100% scale. For example it could be used to measure the level of a liquid in a vessel or container in units of %.

5.38.2 Example URI

/Omaipsopercentageobjectid3320ResURI

5.38.3 Resource type

The Resource Type is defined as: "oic.r.o.percentage".

5.38.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Percentage (Object ID 3320)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsopercentageobjectid3320ResURI": {
      "get": {
        "description": " This IPSO object should can be used to report measurements relative to a 0-
100% scale. For example it could be used to measure the level of a liquid in a vessel or container
in units of %.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsopercentageobjectid3320"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsopercentageobjectid3320": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.percentage"
            ],
            "type": "string"
```

```
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Sensor_Value": {
          "description": "Last or Current Measured Value from the Sensor.",
          "x-label": "Sensor Value",
          "type": "number",
          "readOnly": true
        },
        "Sensor_Units": {
          "description": "Measurement Units Definition.",
          "x-label": "Sensor Units",
          "type": "string",
          "readOnly": true
        },
        "Min_Measured_Value": {
          "description": "The minimum value measured by the sensor since power ON or reset.",
          "x-label": "Min Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Measured_Value": {
          "description": "The maximum value measured by the sensor since power ON or reset.",
          "x-label": "Max Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Min_Range_Value": {
          "description": "The minimum value that can be measured by the sensor.",
          "x-label": "Min Range Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Range_Value": {
          "description": "The maximum value that can be measured by the sensor.",
          "x-label": "Max Range Value",
          "type": "number",
          "readOnly": true
        },
        "Current_Calibration": {
          "description": "Read or Write the current calibration coefficient.",
          "x-label": "Current Calibration",
          "type": "number"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
```

```
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Sensor_Value"
      ]
    }
  }
}
```

5.38.5 Property definition

Table 74 defines the Properties that are part of the "oic.r.o.percentage" Resource Type.

Table 74 – The Property definitions of the Resource with type "rt" = "oic.r.o.percentage".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.

Sensor_Value	number	Yes	Read Only	Last or Current Measured Value from the Sensor.
Sensor_Units	string	No	Read Only	Measurement Units Definition.
Min_Measured_Value	number	No	Read Only	The minimum value measured by the sensor since power ON or reset.
Max_Measured_Value	number	No	Read Only	The maximum value measured by the sensor since power ON or reset.
Min_Range_Value	number	No	Read Only	The minimum value that can be measured by the sensor.
Max_Range_Value	number	No	Read Only	The maximum value that can be measured by the sensor.
Current_Calibration	number	No	Read Write	Read or Write the current calibration coefficient.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future

				extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.38.6 CRUDN behaviour

Table 75 defines the CRUDN operations that are supported on the "oic.r.o.percentage" Resource Type.

Table 75 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.percentage".

Create	Read	Update	Delete	Notify
	get			observe

5.39 OMA/IPSO Positioner (Object ID 3337)

5.39.1 Introduction

This IPSO object should be used with a generic position actuator with range from 0 to 100%. This object optionally allows setting the transition time for an operation that changes the position of the actuator, and for reading the remaining time of the currently active transition.

5.39.2 Example URI

/Omaipsopositionerobjectid3337ResURI

5.39.3 Resource type

The Resource Type is defined as: "oic.r.o.positioner".

5.39.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Positioner (Object ID 3337)",
    "version": "2022-02-22",
```



```
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsopositionerobjectid3337ResURI": {
      "get": {
        "description": " This IPSO object should be used with a generic position actuator with range
from 0 to 100%. This object optionally allows setting the transition time for an operation that
changes the position of the actuator, and for reading the remaining time of the currently active
transition.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsopositionerobjectid3337"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsopositionerobjectid3337": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.positioner"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
```

```
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Current_Position": {
          "description": "Current position or desired position of a positioner actuator.",
          "x-label": "Current Position",
          "maximum": 100,
          "minimum": 0,
          "type": "number",
          "x-unit": "/100"
        },
        "Transition_Time": {
          "description": "The time expected to move the actuator to the new position.",
          "x-label": "Transition Time",
          "type": "number",
          "x-unit": "s"
        },
        "Remaining_Time": {
          "description": "The time remaining in an operation.",
          "x-label": "Remaining Time",
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Min_Measured_Value": {
          "description": "The minimum value measured by the sensor since power ON or reset.",
          "x-label": "Min Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Measured_Value": {
          "description": "The maximum value measured by the sensor since power ON or reset.",
          "x-label": "Max Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Min_Limit": {
          "description": "The minimum value that can be measured by the sensor.",
          "x-label": "Min Limit",
          "type": "number",
          "readOnly": true
        },
        "Max_Limit": {
          "description": "The maximum value that can be measured by the sensor.",
          "x-label": "Max Limit",
          "type": "number",
          "readOnly": true
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
```



```
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Current_Position"
      ]
    }
  }
}
```

5.39.5 Property definition

Table 76 defines the Properties that are part of the "oic.r.o.positioner" Resource Type.

Table 76 – The Property definitions of the Resource with type "rt" = "oic.r.o.positioner".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Current_Position	number	Yes	Read Write	Current position or desired position of a positioner actuator.
Transition_Time	number	No	Read Write	The time expected to move the actuator to the new position.
Remaining_Time	number	No	Read Only	The time remaining in an operation.
Min_Measured_Value	number	No	Read Only	The minimum value measured by the sensor since power ON or reset.
Max_Measured_Value	number	No	Read Only	The maximum value measured by the sensor since power ON or reset.
Min_Limit	number	No	Read Only	The minimum value that can be measured by the sensor.
Max_Limit	number	No	Read Only	The maximum value that can be measured by the sensor.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the

				measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).

5.39.6 CRUDN behaviour

Table 77 defines the CRUDN operations that are supported on the "oic.r.o.positioner" Resource Type.

Table 77 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.positioner".

Create	Read	Update	Delete	Notify
	get			observe

5.40 OMA/IPSO Power (Object ID 3328)

5.40.1 Introduction

This IPSO object should be used to report power measurements. It also provides resources for minimum and maximum measured values, as well as the minimum and maximum range that can be measured by the sensor. An example measurement unit is Watts. This object may be used for either real power or apparent power measurements.

5.40.2 Example URI

/Omaipsopowerobjectid3328ResURI

5.40.3 Resource type

The Resource Type is defined as: "oic.r.o.power".

5.40.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Power (Object ID 3328)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsopowerobjectid3328ResURI": {
      "get": {
        "description": " This IPSO object should be used to report power measurements. It also
provides resources for minimum and maximum measured values, as well as the minimum and maximum range
that can be measured by the sensor. An example measurement unit is Watts. This object may be used
for either real power or apparent power measurements.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
```

```
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsopowerobjectid3328"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsopowerobjectid3328": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.power"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Sensor_Value": {
          "description": "Last or Current Measured Value from the Sensor.",
          "x-label": "Sensor Value",
          "type": "number",
          "readOnly": true
        },
        "Sensor_Units": {
          "description": "Measurement Units Definition.",
          "x-label": "Sensor Units",
          "type": "string",
          "readOnly": true
        },
        "Min_Measured_Value": {
          "description": "The minimum value measured by the sensor since power ON or reset.",
          "x-label": "Min Measured Value",
```

```
          "type": "number",
          "readOnly": true
        },
        "Max_Measured_Value": {
          "description": "The maximum value measured by the sensor since power ON or reset.",
          "x-label": "Max Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Min_Range_Value": {
          "description": "The minimum value that can be measured by the sensor.",
          "x-label": "Min Range Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Range_Value": {
          "description": "The maximum value that can be measured by the sensor.",
          "x-label": "Max Range Value",
          "type": "number",
          "readOnly": true
        },
        "Current_Calibration": {
          "description": "Read or Write the current calibration coefficient.",
          "x-label": "Current Calibration",
          "type": "number"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
```

```
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Sensor_Value"
      ]
    }
  }
}
```

5.40.5 Property definition

Table 78 defines the Properties that are part of the "oic.r.o.power" Resource Type.

Table 78 – The Property definitions of the Resource with type "rt" = "oic.r.o.power".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Sensor_Value	number	Yes	Read Only	Last or Current Measured Value from the Sensor.
Sensor_Units	string	No	Read Only	Measurement Units Definition.
Min_Measured_Value	number	No	Read Only	The minimum value measured by the sensor since power ON or reset.
Max_Measured_Value	number	No	Read Only	The maximum value measured by the sensor since power ON or reset.
Min_Range_Value	number	No	Read Only	The minimum value that can be measured by the sensor.
Max_Range_Value	number	No	Read Only	The maximum value that can be measured by the sensor.
Current_Calibration	number	No	Read Write	Read or Write the current calibration coefficient.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second

				precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.40.6 CRUDN behaviour

Table 79 defines the CRUDN operations that are supported on the "oic.r.o.power" Resource Type.

Table 79 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.power".

Create	Read	Update	Delete	Notify
	get			observe

5.41 OMA/IPSO Power Control (Object ID 3312)

5.41.1 Introduction

This Object is used to control a power source, such as a Smart Plug. It allows a power relay to be turned on or off and its dimmer setting to be control as a % between 0 and 100.

5.41.2 Example URI

/Omaipsopowercontrolobjectid3312ResURI

5.41.3 Resource type

The Resource Type is defined as: "oic.r.o.power.control".

5.41.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Power Control (Object ID 3312)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsopowercontrolobjectid3312ResURI": {
      "get": {
        "description": " This Object is used to control a power source, such as a Smart Plug.  It
allows a power relay to be turned on or off and its dimmer setting to be control as a % between 0
and 100.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsopowercontrolobjectid3312"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
```

```
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsopowercontrolobjectid3312": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.power.control"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "On_Off": {
          "description": "On/off control. Boolean value where True is On and False is Off.",
          "x-label": "On/Off",
          "type": "boolean"
        },
        "Dimmer": {
          "description": "This resource represents a dimmer setting, which has an Integer value
between 0 and 100 as a percentage.",
          "x-label": "Dimmer",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "x-unit": "/100"
        },
        "On_time": {
          "description": "The time in seconds that the device has been on. Writing a value of 0
resets the counter.",
          "x-label": "On time",
          "type": "integer",
          "x-unit": "s"
        },
        "Cumulative_active_power": {
          "description": "The cumulative active power since the last cumulative energy reset or
device start.",
          "x-label": "Cumulative active power",
          "type": "number",
          "x-unit": "Wh",
          "readOnly": true
        },
        "Power_factor": {
          "description": "If applicable, the power factor of the current consumption.",
          "x-label": "Power factor",
          "type": "number",
```

```
          "readOnly": true
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "On_Off"
      ]
    }
  }
}
```

5.41.5 Property definition

Table 80 defines the Properties that are part of the "oic.r.o.power.control" Resource Type.

Table 80 – The Property definitions of the Resource with type "rt" = "oic.r.o.power.control".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
On_Off	boolean	Yes	Read Write	On/off control. Boolean value where True is On and False is Off.
Dimmer	integer	No	Read Write	This resource represents a dimmer setting, which has an Integer value between 0 and 100 as a percentage.
On_time	integer	No	Read Write	The time in seconds that the device has been on. Writing a value of 0 resets the counter.
Cumulative_active_power	number	No	Read Only	The cumulative active power since

				the last cumulative energy reset or device start.
Power_factor	number	No	Read Only	If applicable, the power factor of the current consumption.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).

5.41.6 CRUDN behaviour

Table 81 defines the CRUDN operations that are supported on the "oic.r.o.power.control" Resource Type.

Table 81 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.power.control".

Create	Read	Update	Delete	Notify
	get			observe

5.42 OMA/IPSO Power Factor (Object ID 3329)

5.42.1 Introduction

This IPSO object should be used to report a measurement or calculation of the power factor of a reactive electrical load. Power Factor is normally the ratio of non-reactive power to total power. This object also provides resources for minimum and maximum measured values, as well as the minimum and maximum range that can be measured by the sensor.

5.42.2 Example URI

/Omaipsopowerfactorobjectid3329ResURI

5.42.3 Resource type

The Resource Type is defined as: "oic.r.o.power.factor".

5.42.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Power Factor (Object ID 3329)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
```

```
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsopowerfactorobjectid3329ResURI": {
      "get": {
        "description": " This IPSO object should be used to report a measurement or calculation of
the power factor of a reactive electrical load. Power Factor is normally the ratio of non-reactive
power to total power. This object also provides resources for minimum and maximum measured values,
as well as the minimum and maximum range that can be measured by the sensor.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsopowerfactorobjectid3329"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsopowerfactorobjectid3329": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.power.factor"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
```

```
      "type": "array"
    },
    "Sensor_Value": {
      "description": "Last or Current Measured Value from the Sensor.",
      "x-label": "Sensor Value",
      "type": "number",
      "readOnly": true
    },
    "Sensor_Units": {
      "description": "Measurement Units Definition.",
      "x-label": "Sensor Units",
      "type": "string",
      "readOnly": true
    },
    "Min_Measured_Value": {
      "description": "The minimum value measured by the sensor since power ON or reset.",
      "x-label": "Min Measured Value",
      "type": "number",
      "readOnly": true
    },
    "Max_Measured_Value": {
      "description": "The maximum value measured by the sensor since power ON or reset.",
      "x-label": "Max Measured Value",
      "type": "number",
      "readOnly": true
    },
    "Min_Range_Value": {
      "description": "The minimum value that can be measured by the sensor.",
      "x-label": "Min Range Value",
      "type": "number",
      "readOnly": true
    },
    "Max_Range_Value": {
      "description": "The maximum value that can be measured by the sensor.",
      "x-label": "Max Range Value",
      "type": "number",
      "readOnly": true
    },
    "Current_Calibration": {
      "description": "Read or Write the current calibration coefficient.",
      "x-label": "Current Calibration",
      "type": "number"
    },
    "Application_Type": {
      "description": "The application type of the sensor or actuator as a string depending on
the use case.",
      "x-label": "Application Type",
      "type": "string"
    },
    "Timestamp": {
      "description": "The timestamp of when the measurement was performed.",
      "x-label": "Timestamp",
      "x-sdfType": "unix-time",
      "type": "number",
      "readOnly": true
    },
    "Fractional_Timestamp": {
      "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
      "x-label": "Fractional Timestamp",
      "maximum": 1,
      "minimum": 0,
      "type": "number",
      "x-unit": "s",
      "readOnly": true
    },
    "Measurement_Quality_Indicator": {
      "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
```

```
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Sensor_Value"
      ]
    }
  }
}
```

5.42.5 Property definition

Table 82 defines the Properties that are part of the "oic.r.o.power.factor" Resource Type.

Table 82 – The Property definitions of the Resource with type "rt" = "oic.r.o.power.factor".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Sensor_Value	number	Yes	Read Only	Last or Current Measured Value from the Sensor.
Sensor_Units	string	No	Read Only	Measurement Units Definition.
Min_Measured_Value	number	No	Read Only	The minimum value measured by the sensor since power ON or reset.
Max_Measured_Value	number	No	Read Only	The maximum value measured by the sensor since power ON or reset.
Min_Range_Value	number	No	Read Only	The minimum value that can be measured by the sensor.
Max_Range_Value	number	No	Read Only	The maximum value that can be measured by the sensor.

Current_Calibration	number	No	Read Write	Read or Write the current calibration coefficient.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution

				should be used by the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.42.6 CRUDN behaviour

Table 83 defines the CRUDN operations that are supported on the "oic.r.o.power.factor" Resource Type.

Table 83 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.power.factor".

Create	Read	Update	Delete	Notify
	get			observe

5.43 OMA/IPSO Power Measurement (Object ID 3305)

5.43.1 Introduction

This IPSO object should be used over a power measurement sensor to report a remote power measurement. It also provides resources for minimum/maximum measured values and the minimum/maximum range for both active and reactive power. It also provides resources for cumulative energy, calibration, and the power factor.

5.43.2 Example URI

/Omaipsopowermeasurementobjectid3305ResURI

5.43.3 Resource type

The Resource Type is defined as: "oic.r.o.power.measurement".

5.43.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Power Measurement (Object ID 3305)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsopowermeasurementobjectid3305ResURI": {
      "get": {
        "description": " This IPSO object should be used over a power measurement sensor to report a
remote power measurement. It also provides resources for minimum/maximum measured values and the
minimum/maximum range for both active and reactive power. It also provides resources for cumulative
energy, calibration, and the power factor.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
```

```
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsopowermeasurementobjectid3305"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsopowermeasurementobjectid3305": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.power.measurement"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Instantaneous_active_power": {
          "description": "The current active power.",
          "x-label": "Instantaneous active power",
          "type": "number",
          "x-unit": "W",
          "readOnly": true
        },
        "Min_Measured_active_power": {
          "description": "The minimum active power measured by the sensor since it is ON.",
          "x-label": "Min Measured active power",
          "type": "number",
          "x-unit": "W",
          "readOnly": true
```

```
        },
        "Max_Measured_active_power": {
          "description": "The maximum active power measured by the sensor since it is ON.",
          "x-label": "Max Measured active power",
          "type": "number",
          "x-unit": "W",
          "readOnly": true
        },
        "Min_Range_active_power": {
          "description": "The minimum active power that can be measured by the sensor.",
          "x-label": "Min Range active power",
          "type": "number",
          "x-unit": "W",
          "readOnly": true
        },
        "Max_Range_active_power": {
          "description": "The maximum active power that can be measured by the sensor.",
          "x-label": "Max Range active power",
          "type": "number",
          "x-unit": "W",
          "readOnly": true
        },
        "Cumulative_active_power": {
          "description": "The cumulative active power since the last cumulative energy reset or
device start.",
          "x-label": "Cumulative active power",
          "type": "number",
          "x-unit": "Wh",
          "readOnly": true
        },
        "Active_Power_Calibration": {
          "description": "Request an active power calibration by writing the value of a calibrated
load.",
          "x-label": "Active Power Calibration",
          "x-readable": false,
          "type": "number",
          "x-unit": "W"
        },
        "Instantaneous_reactive_power": {
          "description": "The current reactive power.",
          "x-label": "Instantaneous reactive power",
          "type": "number",
          "x-unit": "var",
          "readOnly": true
        },
        "Min_Measured_reactive_power": {
          "description": "The minimum reactive power measured by the sensor since it is ON.",
          "x-label": "Min Measured reactive power",
          "type": "number",
          "x-unit": "var",
          "readOnly": true
        },
        "Max_Measured_reactive_power": {
          "description": "The maximum reactive power measured by the sensor since it is ON.",
          "x-label": "Max Measured reactive power",
          "type": "number",
          "x-unit": "var",
          "readOnly": true
        },
        "Min_Range_reactive_power": {
          "description": "The minimum active power that can be measured by the sensor.",
          "x-label": "Min Range reactive power",
          "type": "number",
          "x-unit": "var",
          "readOnly": true
        },
        "Max_Range_reactive_power": {
          "description": "The maximum reactive power that can be measured by the sensor.",
          "x-label": "Max Range reactive power",
          "type": "number",
          "x-unit": "var",
          "readOnly": true
```

```
        },
        "Cumulative_reactive_power": {
          "description": "The cumulative reactive power since the last cumulative energy reset or
device start.",
          "x-label": "Cumulative reactive power",
          "type": "number",
          "x-unit": "varh",
          "readOnly": true
        },
        "Reactive_Power_Calibration": {
          "description": "Request a reactive power calibration by writing the value of a calibrated
load.",
          "x-label": "Reactive Power Calibration",
          "x-readable": false,
          "type": "number",
          "x-unit": "var"
        },
        "Power_factor": {
          "description": "If applicable, the power factor of the current consumption.",
          "x-label": "Power factor",
          "type": "number",
          "readOnly": true
        },
        "Current_Calibration": {
          "description": "Read or Write the current calibration coefficient.",
          "x-label": "Current Calibration",
          "type": "number"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
```

```
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Instantaneous_active_power"
      ]
    }
  }
}
```

5.43.5 Property definition

Table 84 defines the Properties that are part of the "oic.r.o.power.measurement" Resource Type.

Table 84 – The Property definitions of the Resource with type "rt" = "oic.r.o.power.measurement".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Instantaneous_active_power	number	Yes	Read Only	The current active power.
Min_Measured_active_power	number	No	Read Only	The minimum active power measured by the sensor since it is ON.
Max_Measured_active_power	number	No	Read Only	The maximum active power measured by the sensor since it is ON.
Min_Range_active_power	number	No	Read Only	The minimum active power that can be measured by the sensor.
Max_Range_active_power	number	No	Read Only	The maximum active power that can be measured by the sensor.
Cumulative_active_power	number	No	Read Only	The cumulative active power since the last cumulative energy reset or device start.
Active_Power_Calibration	number	No	Read Write	Request an active power calibration by writing the value of a calibrated load.
Instantaneous_reactive_power	number	No	Read Only	The current reactive power.

Min_Measured_reactive_power	number	No	Read Only	The minimum reactive power measured by the sensor since it is ON.
Max_Measured_reactive_power	number	No	Read Only	The maximum reactive power measured by the sensor since it is ON.
Min_Range_reactive_power	number	No	Read Only	The minimum active power that can be measured by the sensor.
Max_Range_reactive_power	number	No	Read Only	The maximum reactive power that can be measured by the sensor.
Cumulative_reactive_power	number	No	Read Only	The cumulative reactive power since the last cumulative energy reset or device start.
Reactive_Power_Calibration	number	No	Read Write	Request a reactive power calibration by writing the value of a calibrated load.
Power_factor	number	No	Read Only	If applicable, the power factor of the current consumption.
Current_Calibration	number	No	Read Write	Read or Write the current calibration coefficient.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured

				value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.43.6 CRUDN behaviour

Table 85 defines the CRUDN operations that are supported on the "oic.r.o.power.measurement" Resource Type.

Table 85 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.power.measurement".

Create	Read	Update	Delete	Notify
	get			observe

5.44 OMA/IPSO Presence (Object ID 3302)

5.44.1 Introduction

Presence sensor with digital sensing, optional delay parameters

5.44.2 Example URI

/Omaipsopresenceobjectid3302ResURI

5.44.3 Resource type

The Resource Type is defined as: "oic.r.o.presence".

5.44.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Presence (Object ID 3302)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsopresenceobjectid3302ResURI": {
      "get": {
        "description": " Presence sensor with digital sensing, optional delay parameters",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsopresenceobjectid3302"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsopresenceobjectid3302": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.presence"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
```

```
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Digital_Input_State": {
          "description": "The current state of a digital input.",
          "x-label": "Digital Input State",
          "type": "boolean",
          "readOnly": true
        },
        "Digital_Input_Counter": {
          "description": "The cumulative value of active state detected.",
          "x-label": "Digital Input Counter",
          "type": "integer",
          "readOnly": true
        },
        "Sensor_Type": {
          "description": "The type of the sensor (for instance PIR type).",
          "x-label": "Sensor Type",
          "type": "string",
          "readOnly": true
        },
        "Busy_to_Clear_delay": {
          "description": "Delay from the detection state to the clear state in ms.",
          "x-label": "Busy to Clear delay",
          "type": "integer",
          "x-unit": "ms"
        },
        "Clear_to_Busy_delay": {
          "description": "Delay from the clear state to the busy state in ms.",
          "x-label": "Clear to Busy delay",
          "type": "integer",
          "x-unit": "ms"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
```

```
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Digital_Input_State"
      ]
    }
  }
}
```

5.44.5 Property definition

Table 86 defines the Properties that are part of the "oic.r.o.presence" Resource Type.

Table 86 – The Property definitions of the Resource with type "rt" = "oic.r.o.presence".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Digital_Input_State	boolean	Yes	Read Only	The current state of a digital input.
Digital_Input_Counter	integer	No	Read Only	The cumulative value of active state detected.
Sensor_Type	string	No	Read Only	The type of the sensor (for instance PIR type).
Busy_to_Clear_delay	integer	No	Read Write	Delay from the detection state to the clear state in ms.
Clear_to_Busy_delay	integer	No	Read Write	Delay from the clear state to the busy state in ms.

Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement.

				When the quality level is 0 it means that the measurement should certainly be rejected.

5.44.6 CRUDN behaviour

Table 87 defines the CRUDN operations that are supported on the "oic.r.o.presence" Resource Type.

Table 87 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.presence".

Create	Read	Update	Delete	Notify
	get			observe

5.45 OMA/IPSO Pressure (Object ID 3323)

5.45.1 Introduction

This IPSO object should be used to report pressure measurements. It also provides resources for minimum and maximum measured values, as well as the minimum and maximum range that can be measured by the sensor. An example measurement unit is pascals.

5.45.2 Example URI

/Omaipsopressureobjectid3323ResURI

5.45.3 Resource type

The Resource Type is defined as: "oic.r.o.pressure".

5.45.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Pressure (Object ID 3323)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsopressureobjectid3323ResURI": {
      "get": {
        "description": " This IPSO object should be used to report pressure measurements. It also
provides resources for minimum and maximum measured values, as well as the minimum and maximum range
that can be measured by the sensor. An example measurement unit is pascals.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsopressureobjectid3323"
```

```
          }
        }
      }
    }
  }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsopressureobjectid3323": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.pressure"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Sensor_Value": {
          "description": "Last or Current Measured Value from the Sensor.",
          "x-label": "Sensor Value",
          "type": "number",
          "readOnly": true
        },
        "Sensor_Units": {
          "description": "Measurement Units Definition.",
          "x-label": "Sensor Units",
          "type": "string",
          "readOnly": true
        },
        "Min_Measured_Value": {
          "description": "The minimum value measured by the sensor since power ON or reset.",
          "x-label": "Min Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Measured_Value": {
          "description": "The maximum value measured by the sensor since power ON or reset.",
```

```
          "x-label": "Max Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Min_Range_Value": {
          "description": "The minimum value that can be measured by the sensor.",
          "x-label": "Min Range Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Range_Value": {
          "description": "The maximum value that can be measured by the sensor.",
          "x-label": "Max Range Value",
          "type": "number",
          "readOnly": true
        },
        "Current_Calibration": {
          "description": "Read or Write the current calibration coefficient.",
          "x-label": "Current Calibration",
          "type": "number"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
```

```
        "Sensor_Value"
      ]
    }
  }
}
```

5.45.5 Property definition

Table 88 defines the Properties that are part of the "oic.r.o.pressure" Resource Type.

Table 88 – The Property definitions of the Resource with type "rt" = "oic.r.o.pressure".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Sensor_Value	number	Yes	Read Only	Last or Current Measured Value from the Sensor.
Sensor_Units	string	No	Read Only	Measurement Units Definition.
Min_Measured_Value	number	No	Read Only	The minimum value measured by the sensor since power ON or reset.
Max_Measured_Value	number	No	Read Only	The maximum value measured by the sensor since power ON or reset.
Min_Range_Value	number	No	Read Only	The minimum value that can be measured by the sensor.
Max_Range_Value	number	No	Read Only	The maximum value that can be measured by the sensor.
Current_Calibration	number	No	Read Write	Read or Write the current calibration coefficient.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).

Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.45.6 CRUDN behaviour

Table 89 defines the CRUDN operations that are supported on the "oic.r.o.pressure" Resource Type.

Table 89 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.pressure".

Create	Read	Update	Delete	Notify
	get			observe

5.46 OMA/IPSO Push button (Object ID 3347)

5.46.1 Introduction

This IPSO object is used to report the state of a momentary action push button control and to count the number of times the control has been operated since the last observation.

5.46.2 Example URI

/Omaipsopushbuttonobjectid3347ResURI

5.46.3 Resource type

The Resource Type is defined as: "oic.r.o.push.button".

5.46.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Push button (Object ID 3347)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsopushbuttonobjectid3347ResURI": {
      "get": {
        "description": " This IPSO object is used to report the state of a momentary action push
button control and to count the number of times the control has been operated since the last
observation.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsopushbuttonobjectid3347"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
```

```
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsopushbuttonobjectid3347": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.push.button"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Digital_Input_State": {
          "description": "The current state of a digital input.",
          "x-label": "Digital Input State",
          "type": "boolean",
          "readOnly": true
        },
        "Digital_Input_Counter": {
          "description": "The cumulative value of active state detected.",
          "x-label": "Digital Input Counter",
          "type": "integer",
          "readOnly": true
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
```

```
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Digital_Input_State"
      ]
    }
  }
}
```

5.46.5 Property definition

Table 90 defines the Properties that are part of the "oic.r.o.push.button" Resource Type.

Table 90 – The Property definitions of the Resource with type "rt" = "oic.r.o.push.button".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Digital_Input_State	boolean	Yes	Read Only	The current state of a digital input.
Digital_Input_Counter	integer	No	Read Only	The cumulative value of active state detected.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).

5.46.6 CRUDN behaviour

Table 91 defines the CRUDN operations that are supported on the "oic.r.o.push.button" Resource Type.

Table 91 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.push.button".

Create	Read	Update	Delete	Notify
	get			observe

5.47 OMA/IPSO Rate (Object ID 3346)

5.47.1 Introduction

This object type should be used to report a rate measurement, for example the speed of a vehicle, or the rotational speed of a drive shaft. It also provides resources for minimum and

maximum measured values, as well as the minimum and maximum range that can be measured by the sensor. An example measurement unit is meters per second (m/s).

5.47.2 Example URI

/Omaipsorateobjectid3346ResURI

5.47.3 Resource type

The Resource Type is defined as: "oic.r.o.rate".

5.47.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Rate (Object ID 3346)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsorateobjectid3346ResURI": {
      "get": {
        "description": " This object type should be used to report a rate measurement, for example
the speed of a vehicle, or the rotational speed of a drive shaft. It also provides resources for
minimum and maximum measured values, as well as the minimum and maximum range that can be measured
by the sensor. An example measurement unit is meters per second (m/s).",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsorateobjectid3346"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsorateobjectid3346": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
```

```
          "items": {
            "enum": [
              "oic.r.o.rate"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Sensor_Value": {
          "description": "Last or Current Measured Value from the Sensor.",
          "x-label": "Sensor Value",
          "type": "number",
          "readOnly": true
        },
        "Sensor_Units": {
          "description": "Measurement Units Definition.",
          "x-label": "Sensor Units",
          "type": "string",
          "readOnly": true
        },
        "Min_Measured_Value": {
          "description": "The minimum value measured by the sensor since power ON or reset.",
          "x-label": "Min Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Measured_Value": {
          "description": "The maximum value measured by the sensor since power ON or reset.",
          "x-label": "Max Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Min_Range_Value": {
          "description": "The minimum value that can be measured by the sensor.",
          "x-label": "Min Range Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Range_Value": {
          "description": "The maximum value that can be measured by the sensor.",
          "x-label": "Max Range Value",
          "type": "number",
          "readOnly": true
        },
        "Current_Calibration": {
          "description": "Read or Write the current calibration coefficient.",
          "x-label": "Current Calibration",
          "type": "number"
        },
        "Application_Type": {
```

```
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Sensor_Value"
      ]
    }
  }
}
```


5.47.5 Property definition

Table 92 defines the Properties that are part of the "oic.r.o.rate" Resource Type.

Table 92 – The Property definitions of the Resource with type "rt" = "oic.r.o.rate".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	

if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Sensor_Value	number	Yes	Read Only	Last or Current Measured Value from the Sensor.
Sensor_Units	string	No	Read Only	Measurement Units Definition.
Min_Measured_Value	number	No	Read Only	The minimum value measured by the sensor since power ON or reset.
Max_Measured_Value	number	No	Read Only	The maximum value measured by the sensor since power ON or reset.
Min_Range_Value	number	No	Read Only	The minimum value that can be measured by the sensor.
Max_Range_Value	number	No	Read Only	The maximum value that can be measured by the sensor.
Current_Calibration	number	No	Read Write	Read or Write the current calibration coefficient.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4:

				ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.47.6 CRUDN behaviour

Table 93 defines the CRUDN operations that are supported on the "oic.r.o.rate" Resource Type.

Table 93 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.rate".

Create	Read	Update	Delete	Notify
	get			observe

5.48 OMA/IPSO Set Point (Object ID 3308)

5.48.1 Introduction

This IPSO object should be used to set a desired value to a controller, such as a thermostat. A special resource is added to set the colour of an object.

5.48.2 Example URI

/Omaipsosetpointobjectid3308ResURI

5.48.3 Resource type

The Resource Type is defined as: "oic.r.o.set.point".

5.48.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Set Point (Object ID 3308)",
```



```
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsosetpointobjectid3308ResURI": {
      "get": {
        "description": " This IPSO object should be used to set a desired value to a controller,
such as a thermostat. A special resource is added to set the colour of an object.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsosetpointobjectid3308"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsosetpointobjectid3308": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.set.point"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
```

```
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Set_Point_Value": {
          "description": "The setpoint value.",
          "x-label": "Set Point Value",
          "type": "number"
        },
        "Sensor_Units": {
          "description": "Measurement Units Definition.",
          "x-label": "Sensor Units",
          "type": "string",
          "readOnly": true
        },
        "Colour": {
          "description": "A string representing a value in some color space.",
          "x-label": "Colour",
          "type": "string"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Set_Point_Value"
      ]
    }
  }
}
```

5.48.5 Property definition

Table 94 defines the Properties that are part of the "oic.r.o.set.point" Resource Type.

Table 94 – The Property definitions of the Resource with type "rt" = "oic.r.o.set.point".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	

if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Set_Point_Value	number	Yes	Read Write	The setpoint value.
Sensor_Units	string	No	Read Only	Measurement Units Definition.
Colour	string	No	Read Write	A string representing a value in some color space.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).

5.48.6 CRUDN behaviour

Table 95 defines the CRUDN operations that are supported on the "oic.r.o.set.point" Resource Type.

Table 95 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.set.point".

Create	Read	Update	Delete	Notify
	get			observe

5.49 OMA/IPSO Stopwatch (Object ID 3350)

5.49.1 Introduction

An ascending timer that counts how long time has passed since the timer was started after reset.

5.49.2 Example URI

/Omaipsostopwatchobjectid3350ResURI

5.49.3 Resource type

The Resource Type is defined as: "oic.r.o.stopwatch".

5.49.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Stopwatch (Object ID 3350)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
```

```
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsostopwatchobjectid3350ResURI": {
      "get": {
        "description": " An ascending timer that counts how long time has passed since the timer was
started after reset.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsostopwatchobjectid3350"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsostopwatchobjectid3350": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.stopwatch"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
```

```
        "Cumulative_Time": {
          "description": "The total time in seconds that the timer input is true. Writing a 0 resets
the time.",
          "x-label": "Cumulative Time",
          "type": "number",
          "x-unit": "s"
        },
        "On_Off": {
          "description": "On/off control. Boolean value where True is On and False is Off.",
          "x-label": "On/Off",
          "type": "boolean"
        },
        "Digital_Input_Counter": {
          "description": "The cumulative value of active state detected.",
          "x-label": "Digital Input Counter",
          "type": "integer",
          "readOnly": true
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Cumulative_Time"
      ]
    }
```

```
  }
}
```

5.49.5 Property definition

Table 96 defines the Properties that are part of the "oic.r.o.stopwatch" Resource Type.

Table 96 – The Property definitions of the Resource with type "rt" = "oic.r.o.stopwatch".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Cumulative_Time	number	Yes	Read Write	The total time in seconds that the timer input is true. Writing a 0 resets the time.
On_Off	boolean	No	Read Write	On/off control. Boolean value where True is On and False is Off.
Digital_Input_Counter	integer	No	Read Only	The cumulative value of active state detected.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The

				measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.49.6 CRUDN behaviour

Table 97 defines the CRUDN operations that are supported on the "oic.r.o.stopwatch" Resource Type.

Table 97 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.stopwatch".

Create	Read	Update	Delete	Notify
	get			observe

5.50 OMA/IPSO Temperature (Object ID 3303)

5.50.1 Introduction

This IPSO object should be used with a temperature sensor to report a temperature measurement. It also provides resources for minimum/maximum measured values and the minimum/maximum range that can be measured by the temperature sensor. An example measurement unit is degrees Celsius.

5.50.2 Example URI

/Omaipsotemperatureobjectid3303ResURI

5.50.3 Resource type

The Resource Type is defined as: "oic.r.o.temperature".

5.50.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Temperature (Object ID 3303)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsotemperatureobjectid3303ResURI": {
      "get": {
        "description": " This IPSO object should be used with a temperature sensor to report a
temperature measurement.  It also provides resources for minimum/maximum measured values and the
minimum/maximum range that can be measured by the temperature sensor. An example measurement unit is
degrees Celsius.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsotemperatureobjectid3303"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsotemperatureobjectid3303": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.temperature"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
```

```
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Sensor_Value": {
          "description": "Last or Current Measured Value from the Sensor.",
          "x-label": "Sensor Value",
          "type": "number",
          "readOnly": true
        },
        "Min_Measured_Value": {
          "description": "The minimum value measured by the sensor since power ON or reset.",
          "x-label": "Min Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Measured_Value": {
          "description": "The maximum value measured by the sensor since power ON or reset.",
          "x-label": "Max Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Min_Range_Value": {
          "description": "The minimum value that can be measured by the sensor.",
          "x-label": "Min Range Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Range_Value": {
          "description": "The maximum value that can be measured by the sensor.",
          "x-label": "Max Range Value",
          "type": "number",
          "readOnly": true
        },
        "Sensor_Units": {
          "description": "Measurement Units Definition.",
          "x-label": "Sensor Units",
          "type": "string",
          "readOnly": true
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
```

```
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Sensor_Value"
      ]
    }
  }
}
```

5.50.5 Property definition

Table 98 defines the Properties that are part of the "oic.r.o.temperature" Resource Type.

Table 98 – The Property definitions of the Resource with type "rt" = "oic.r.o.temperature".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Sensor_Value	number	Yes	Read Only	Last or Current Measured Value from the Sensor.
Min_Measured_Value	number	No	Read Only	The minimum value measured by the sensor since power ON or reset.
Max_Measured_Value	number	No	Read Only	The maximum value measured by the sensor since power ON or reset.

Min_Range_Value	number	No	Read Only	The minimum value that can be measured by the sensor.
Max_Range_Value	number	No	Read Only	The maximum value that can be measured by the sensor.
Sensor_Units	string	No	Read Only	Measurement Units Definition.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has

				decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.50.6 CRUDN behaviour

Table 99 defines the CRUDN operations that are supported on the "oic.r.o.temperature" Resource Type.

Table 99 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.temperature".

Create	Read	Update	Delete	Notify
	get			observe

5.51 OMA/IPSO Time (Object ID 3333)

5.51.1 Introduction

This IPSO object is used to report the current time in seconds since January 1, 1970 UTC. There is also a fractional time counter that has a range of less than one second.

5.51.2 Example URI

/Omaipsotimeobjectid3333ResURI

5.51.3 Resource type

The Resource Type is defined as: "oic.r.o.time".

5.51.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Time (Object ID 3333)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsotimeobjectid3333ResURI": {
      "get": {
        "description": " This IPSO object is used to report the current time in seconds since
January 1, 1970 UTC. There is also a fractional time counter that has a range of less than one
```

```
second.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsotimeobjectid3333"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsotimeobjectid3333": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.time"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Current_Time": {
          "description": "Unix Time. A signed integer representing the number of seconds since Jan
1st, 1970 in the UTC time zone.",
          "x-label": "Current Time",
          "x-sdfType": "unix-time",
          "type": "number"
        },
        "Fractional_Time": {
          "description": "Fractional part of the time when sub-second precision is used (e.g., 0.23
```

```
for 230 ms).",
          "x-label": "Fractional Time",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Current_Time"
      ]
    }
  }
}
```

5.51.5 Property definition

Table 100 defines the Properties that are part of the "oic.r.o.time" Resource Type.

Table 100 – The Property definitions of the Resource with type "rt" = "oic.r.o.time".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Current_Time	number	Yes	Read Write	Unix Time. A signed integer representing the number of seconds since Jan 1st, 1970

				in the UTC time zone.
Fractional_Time	number	No	Read Write	Fractional part of the time when sub-second precision is used (e.g., 0.23 for 230 ms).
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement. When the quality level is 0 it means that the

				measurement should certainly be rejected.

5.51.6 CRUDN behaviour

Table 101 defines the CRUDN operations that are supported on the "oic.r.o.time" Resource Type.

Table 101 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.time".

Create	Read	Update	Delete	Notify
	get			observe

5.52 OMA/IPSO Timer (Object ID 3340)

5.52.1 Introduction

This IPSO object is used to time events and actions, using patterns common to industrial timers. A write to the trigger resource or On/Off input state change starts the timing operation, and the timer remaining time shows zero when the operation is complete. The patterns supported are One-Shot (mode 1), On-Time or Interval (mode 2), Time delay on pick-up or TDPU (mode 3), and Time Delay on Drop-Out or TDDO (mode 4). Mode 0 disables the timer, so the output follows the input with no delay. A counter is provided to count occurrences of the timer output changing from 0 to 1. Writing a value of zero resets the counter. The Digital Input State resource reports the state of the timer output.

5.52.2 Example URI

/Omaipsotimerobjectid3340ResURI

5.52.3 Resource type

The Resource Type is defined as: "oic.r.o.timer".

5.52.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Timer (Object ID 3340)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsotimerobjectid3340ResURI": {
      "get": {
        "description": " This IPSO object is used to time events and actions, using patterns common
to industrial timers. A write to the trigger resource or On/Off input state change starts the timing
operation, and the timer remaining time shows zero when the operation is complete. The patterns
supported are One-Shot (mode 1), On-Time or Interval (mode 2), Time delay on pick-up or TDPU (mode
3), and Time Delay on Drop-Out or TDDO (mode 4). Mode 0 disables the timer, so the output follows
the input with no delay. A counter is provided to count occurrences of the timer output changing
from 0 to 1. Writing a value of zero resets the counter. The Digital Input State resource reports
the state of the timer output.",
        "parameters": [
          {
```

```
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsotimerobjectid3340"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
  },
  "definitions": {
    "Omaipsotimerobjectid3340": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.timer"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Delay_Duration": {
          "description": "The duration of the time delay.",
          "x-label": "Delay Duration",
          "type": "number",
          "x-unit": "s"
        },
        "Remaining_Time": {
          "description": "The time remaining in an operation.",
          "x-label": "Remaining Time",
          "type": "number",
          "x-unit": "s",
          "readOnly": true
```



```
        },
        "Minimum_Off-time": {
          "description": "The duration of the rearm delay (i.e. the delay from the end of one cycle
until the beginning of the next, the inhibit time).",
          "x-label": "Minimum Off-time",
          "type": "number",
          "x-unit": "s"
        },
        "On_Off": {
          "description": "On/off control. Boolean value where True is On and False is Off.",
          "x-label": "On/Off",
          "type": "boolean"
        },
        "Digital_Input_Counter": {
          "description": "The cumulative value of active state detected.",
          "x-label": "Digital Input Counter",
          "type": "integer",
          "readOnly": true
        },
        "Cumulative_Time": {
          "description": "The total time in seconds that the timer input is true. Writing a 0 resets
the time.",
          "x-label": "Cumulative Time",
          "type": "number",
          "x-unit": "s"
        },
        "Digital_State": {
          "description": "The current state of the timer output.",
          "x-label": "Digital State",
          "type": "boolean",
          "readOnly": true
        },
        "Counter": {
          "description": "Counts the number of times the timer output transitions from 0 to 1.",
          "x-label": "Counter",
          "type": "integer"
        },
        "Timer_Mode": {
          "description": "Type of timer pattern used by the timer. 1: One-shot, 2: On-Time or
Interval, 3: Time delay on pick-up, 4: Time Delay on Drop-Out, 0: disables the timer.",
          "x-label": "Timer Mode",
          "maximum": 4,
          "minimum": 0,
          "type": "integer"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        }
      },
      "type": "object",
      "required": [
        "Delay_Duration"
      ]
    }
  }
}
```

5.52.5 Property definition

Table 102 defines the Properties that are part of the "oic.r.o.timer" Resource Type.

Table 102 – The Property definitions of the Resource with type "rt" = "oic.r.o.timer".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.

n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Delay_Duration	number	Yes	Read Write	The duration of the time delay.
Remaining_Time	number	No	Read Only	The time remaining in an operation.
Minimum_Off-time	number	No	Read Write	The duration of the rearm delay (i.e. the delay from the end of one cycle until the beginning of the next, the inhibit time).
On_Off	boolean	No	Read Write	On/off control. Boolean value where True is On and False is Off.
Digital_Input_Counter	integer	No	Read Only	The cumulative value of active state detected.
Cumulative_Time	number	No	Read Write	The total time in seconds that the timer input is true. Writing a 0 resets the time.
Digital_State	boolean	No	Read Only	The current state of the timer output.
Counter	integer	No	Read Write	Counts the number of times the timer output transitions from 0 to 1.
Timer_Mode	integer	No	Read Write	Type of timer pattern used by the timer. 1: One-shot, 2: On-Time or Interval, 3: Time delay on pick-up, 4: Time Delay on Drop-Out, 0: disables the timer.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.

5.52.6 CRUDN behaviour

Table 103 defines the CRUDN operations that are supported on the "oic.r.o.timer" Resource Type.

Table 103 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.timer".

Create	Read	Update	Delete	Notify
	get			observe

5.53 OMA/IPSO Voltage (Object ID 3316)

5.53.1 Introduction

This IPSO object should be used with voltmeter sensor to report measured voltage between two points. It also provides resources for minimum and maximum measured values, as well as the minimum and maximum range that can be measured by the sensor. An example measurement unit is volts.

5.53.2 Example URI

/Omaipsovoltageobjectid3316ResURI

5.53.3 Resource type

The Resource Type is defined as: "oic.r.o.voltage".

5.53.4 OpenAPI 2.0 definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "OMA/IPSO Voltage (Object ID 3316)",
    "version": "2022-02-22",
    "license": {
      "name": "BSD-3-Clause",
      "x-copyright": "Copyright 2019 Open Mobile Alliance."
    }
  },
  "schemes": [
    "http"
  ],
  "consumes": [
    "application/json"
  ],
  "produces": [
    "application/json"
  ],
  "paths": {
    "/Omaipsovoltageobjectid3316ResURI": {
      "get": {
        "description": " This IPSO object should be used with voltmeter sensor to report measured
voltage between two points.  It also provides resources for minimum and maximum measured values, as
well as the minimum and maximum range that can be measured by the sensor. An example measurement
unit is volts.",
        "parameters": [
          {
            "$ref": "#/parameters/interface"
          }
        ],
        "responses": {
          "200": {
            "description": "",
            "schema": {
              "$ref": "#/definitions/Omaipsovoltageobjectid3316"
            }
          }
        }
      }
    }
  },
  "parameters": {
    "interface": {
      "in": "query",
      "name": "if",
      "type": "string",
      "enum": [
        "oic.if.s",
        "oic.if.baseline"
      ]
    }
```

```
  },
  "definitions": {
    "Omaipsovoltageobjectid3316": {
      "properties": {
        "rt": {
          "description": "The Resource Type.",
          "items": {
            "enum": [
              "oic.r.o.voltage"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "n": {
          "$ref":
"https://openconnectivityfoundation.github.io/core/schemas/oic.common.properties.core-
schema.json#/definitions/n"
        },
        "if": {
          "description": "The OCF Interface set supported by this Resource.",
          "items": {
            "enum": [
              "oic.if.s",
              "oic.if.baseline"
            ],
            "type": "string"
          },
          "minItems": 1,
          "uniqueItems": true,
          "readOnly": true,
          "type": "array"
        },
        "Sensor_Value": {
          "description": "Last or Current Measured Value from the Sensor.",
          "x-label": "Sensor Value",
          "type": "number",
          "readOnly": true
        },
        "Sensor_Units": {
          "description": "Measurement Units Definition.",
          "x-label": "Sensor Units",
          "type": "string",
          "readOnly": true
        },
        "Min_Measured_Value": {
          "description": "The minimum value measured by the sensor since power ON or reset.",
          "x-label": "Min Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Measured_Value": {
          "description": "The maximum value measured by the sensor since power ON or reset.",
          "x-label": "Max Measured Value",
          "type": "number",
          "readOnly": true
        },
        "Min_Range_Value": {
          "description": "The minimum value that can be measured by the sensor.",
          "x-label": "Min Range Value",
          "type": "number",
          "readOnly": true
        },
        "Max_Range_Value": {
          "description": "The maximum value that can be measured by the sensor.",
          "x-label": "Max Range Value",
          "type": "number",
          "readOnly": true
        },
```

```
        "Current_Calibration": {
          "description": "Read or Write the current calibration coefficient.",
          "x-label": "Current Calibration",
          "type": "number"
        },
        "Application_Type": {
          "description": "The application type of the sensor or actuator as a string depending on
the use case.",
          "x-label": "Application Type",
          "type": "string"
        },
        "Timestamp": {
          "description": "The timestamp of when the measurement was performed.",
          "x-label": "Timestamp",
          "x-sdfType": "unix-time",
          "type": "number",
          "readOnly": true
        },
        "Fractional_Timestamp": {
          "description": "Fractional part of the timestamp when sub-second precision is used (e.g.,
0.23 for 230 ms).",
          "x-label": "Fractional Timestamp",
          "maximum": 1,
          "minimum": 0,
          "type": "number",
          "x-unit": "s",
          "readOnly": true
        },
        "Measurement_Quality_Indicator": {
          "description": "Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No
quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY
The measured value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3:
ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15:
Reserved for future extensions. 16-23: Vendor specific measurement quality.",
          "x-label": "Measurement Quality Indicator",
          "maximum": 23,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        },
        "Measurement_Quality_Level": {
          "description": "Measurement quality level reported by a smart sensor. Quality level 100
means that the measurement has fully passed quality check algorithms. Smaller quality levels mean
that quality has decreased and the measurement has only partially passed quality check algorithms.
The smaller the quality level, the more caution should be used by the application when using the
measurement. When the quality level is 0 it means that the measurement should certainly be
rejected.",
          "x-label": "Measurement Quality Level",
          "maximum": 100,
          "minimum": 0,
          "type": "integer",
          "readOnly": true
        }
      },
      "type": "object",
      "required": [
        "Sensor_Value"
      ]
    }
  }
}
```

5.53.5 Property definition

Table 104 defines the Properties that are part of the "oic.r.o.voltage" Resource Type.

Table 104 – The Property definitions of the Resource with type "rt" = "oic.r.o.voltage".

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema	No	Read Only	The Resource Type.
n	multiple types: see schema	No	Read Write	
if	array: see schema	No	Read Only	The OCF Interface set supported by this Resource.
Sensor_Value	number	Yes	Read Only	Last or Current Measured Value from the Sensor.
Sensor_Units	string	No	Read Only	Measurement Units Definition.
Min_Measured_Value	number	No	Read Only	The minimum value measured by the sensor since power ON or reset.
Max_Measured_Value	number	No	Read Only	The maximum value measured by the sensor since power ON or reset.
Min_Range_Value	number	No	Read Only	The minimum value that can be measured by the sensor.
Max_Range_Value	number	No	Read Only	The maximum value that can be measured by the sensor.
Current_Calibration	number	No	Read Write	Read or Write the current calibration coefficient.
Application_Type	string	No	Read Write	The application type of the sensor or actuator as a string depending on the use case.
Timestamp	number	No	Read Only	The timestamp of when the measurement was performed.
Fractional_Timestamp	number	No	Read Only	Fractional part of the timestamp when sub-second precision is used (e.g., 0.23 for 230 ms).
Measurement_Quality_Indicator	integer	No	Read Only	Measurement quality indicator reported by a smart sensor. 0: UNCHECKED No quality checks were done because they do not exist or can not be applied. 1: REJECTED WITH CERTAINTY The measured

				value is invalid. 2: REJECTED WITH PROBABILITY The measured value is likely invalid. 3: ACCEPTED BUT SUSPICIOUS The measured value is likely OK. 4: ACCEPTED The measured value is OK. 5-15: Reserved for future extensions. 16-23: Vendor specific measurement quality.
Measurement_Quality_Level	integer	No	Read Only	Measurement quality level reported by a smart sensor. Quality level 100 means that the measurement has fully passed quality check algorithms. Smaller quality levels mean that quality has decreased and the measurement has only partially passed quality check algorithms. The smaller the quality level, the more caution should be used by the application when using the measurement. When the quality level is 0 it means that the measurement should certainly be rejected.

5.53.6 CRUDN behaviour

Table 105 defines the CRUDN operations that are supported on the "oic.r.o.voltage" Resource Type.

Table 105 – The CRUDN operations of the Resource with type "rt" = "oic.r.o.voltage".

Create	Read	Update	Delete	Notify
	get			observe