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Information technology — Open Connectivity Foundation (OCF) Specification —

Part 8: OCF resource to oneM2M resource mapping specification

Technologies de l'information — Specification de la Fondation pour la connectivité ouverte (Fondation OCF) —

Partie 8: Spécification du mapping entre ressources OCF et ressources oneM2M

Reference number
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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted (see www.iso.org/directives or www.iec.ch/members_experts/refdocs).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents) or the IEC list of patent declarations received (see patents.iec.ch).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html. In the IEC, see www.iec.ch/understanding-standards.

This document was prepared by the Open Connectivity Foundation (OCF) (as OCF Resource to OneM2M Module Class Mapping Specification, version 2.2.0) and drafted in accordance with its editorial rules. It was adopted, under the JTC 1 PAS procedure, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*.

A list of all parts in the ISO/IEC 30118 series can be found on the ISO and IEC websites.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html and www.iec.ch/national-committees.

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.

ISO/IEC 30118 consists of eighteen parts, under the general title Information technology — Open Connectivity Foundation (OCF) Specification. The parts fall into logical groupings as described herein:

- Core framework
  - Part 1: Core Specification
  - Part 2: Security Specification
  - Part 13: Onboarding Tool Specification
- Bridging framework and bridges
  - Part 3: Bridging Specification
  - Part 6: Resource to Alljoyn Interface Mapping Specification
  - Part 8: OCF Resource to oneM2M Resource Mapping Specification
  - Part 14: OCF Resource to BLE Mapping Specification
  - Part 15: OCF Resource to EnOcean Mapping Specification
  - Part 16: OCF Resource to UPlus Mapping Specification
  - Part 17: OCF Resource to Zigbee Cluster Mapping Specification
  - Part 18: OCF Resource to Z-Wave Mapping Specification
- Resource and Device models
  - Part 4: Resource Type Specification
  - Part 5: Device Specification

- Core framework extensions
  - Part 7: Wi-Fi Easy Setup Specification
  - Part 9: Core Optional Specification
- OCF Cloud
  - Part 10: Cloud API for Cloud Services Specification
  - Part 11: Device to Cloud Services Specification
  - Part 12: Cloud Security Specification

Information technology — Open Connectivity Foundation (OCF) Specification —

Part 8:
OCF resource to oneM2M resource mapping specification

1 Scope

This document provides detailed mapping information to provide equivalency between oneM2M defined Module Classes and OCF defined Resources.

A oneM2M Bridge is Asymmetric Client Bridge, therefore this document provides unidirectional mapping for Device Types (oneM2M Devices to OCF Devices), identifies equivalent OCF Resources for specific oneM2M Module Classes, and defines the detailed Property by Property mapping using OCF defined extensions to JSON schema to programmatically define the mappings.

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 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

ISO/IEC 30118-3 Information technology – Open Connectivity Foundation (OCF) Specification – Part 3: Bridging specification
https://www.iso.org/standard/74240.html
Latest version available at: https://openconnectivity.org/specs/OCF_Bridging_Specification.pdf

ISO/IEC 30118-4 Information technology – Open Connectivity Foundation (OCF) Specification – Part 4: Resource type specification
https://www.iso.org/standard/74241.html
Latest version available at: https://openconnectivity.org/specs/OCF_Resource_Type_Specification.pdf

ISO/IEC 30118-5 Information technology – Open Connectivity Foundation (OCF) Specification – Part 5: Smart home device specification
https://www.iso.org/standard/74242.html
Latest version available at: https://openconnectivity.org/specs/OCF_Device_Specification.pdf

Derived Models for Interoperability between IoT Ecosystems, Stevens & Merriam, March 2016 https://www.iab.org/wp-content/IAB-uploads/2016/03/OCF-Derived-Models-for-Interoperability-Between-IoT-Ecosystems_v2-examples.pdf

3 Terms and definitions

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 ISO/IEC 30118-3 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/

3.1.1
oneM2M Application
the oneM2M control point (i.e. client) being mapped to a Virtual OCF Client.

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).

– These basic features shall be implemented to comply with OIC 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).

– These features add functionality supported by OIC Core Architecture and should be implemented. Recommended features take advantage of the capabilities OIC 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 (or allowed).

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

– 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.

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.

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

Words that are emphasized are printed in *italic*.

5 Theory of operation

5.1 Interworking approach

The interworking between oneM2M defined Module Classes and OCF defined Resource Types is modelled using the derived model syntax described in Derived Models for Interoperability.

5.2 Mapping syntax

5.2.1 Introduction

Within the defined syntax for derived modelling used by this document there are two blocks that define the actual Property-Property equivalence or mapping. These blocks are identified by the keywords "x-to-ocf" and "x-from-ocf". Derived Models for Interoperability does not define a rigid syntax for these blocks; they are free form string arrays that contain pseudo-coded mapping logic.

Within this document we apply the rules defined in clause 5.2 to these blocks to ensure consistency and re-usability and extensibility of the mapping logic that is defined.

5.2.2 General

All statements are terminated with a carriage return.

5.2.3 Value assignment

The equals sign (=) is used to assign one value to another. The assignee is on the left of the operator; the value being assigned on the right.

5.2.4 Property naming

All Property names are identical to the name used by the original model; for example, from the OCF Temperature Resource the Property name "temperature" is used whereas when referred to the derived ecosystem then the semantically equivalent Property name is used.

5.2.5 Arrays

An array element is indicated by the use of square brackets "[]" with the index of the element contained therein, e.g. range[1]. All arrays start at an index of 0. If an entire array is being referenced, then no index is included.

5.2.6 Conditional mapping

When a mapping is dependent on the meeting of other conditions then the syntax:

if "condition", "mapping".

is applied.

6 oneM2M translation

6.1 Operational scenarios

The purpose of the oneM2M Bridge Platform is to enable access by the oneM2M ecosystem to select OCF Servers. This is accomplished by creating Virtual OCF Clients to represent the necessary access levels to the OCF servers that are exposed to the oneM2M ecosystem. The oneM2M Bridge Platform then exposes native oneM2M entities that map to those Virtual OCF Clients.

The oneM2M Bridge Platform is an Asymmetric Client Bridge.

The mapping between the OCF data models and the oneM2M data models is specified in 9. Programmatic (i.e. On-the-fly) data model translation is not supported.

6.2 Enabling oneM2M application access to OCF servers

Each level of oneM2M application access for OCF servers is modelled as a Virtual OCF Client. In this way, oneM2M application access can be appropriately restricted and enforced by the OCF security capabilities.

6.3 Enabling OCF client access to oneM2M devices

This capability is not supported.

6.4 On-the-fly translation

All devices and resources have been aligned between the OCF and oneM2M ecosystems, so on-the-fly translation is not required.

If new OCF devices are not reflected into the oneM2M ecosystem by updates to the oneM2M specifications, the Bridge Platform will not provide a successful translation of those devices.

7 Device type mapping

7.1 Introduction

This clause contains the mappings to/from Device Types.

7.2 OneM2M device types to OCF device types

Table 1 captures the equivalency mapping between oneM2M defined Device Types and OCF defined Device Types. The minimum Resource sets for each OCF Device is provided in ISO/IEC 30118-5.

Table 1 – oneM2M Device Type to OCF Device Type Mapping

oneM2M Device Type	OCF Device Type
device3DPrinter	oic.d.3dprinter
deviceAirConditioner	oic.d.airconditioner
deviceAirPurifier	oic.d.airpurifier
deviceAirQualityMonitor	oic.d.airqualitymonitor
deviceAudioReceiver	oic.d.receiver
deviceBloodPressureMonitor	oic.d.bloodpressuremonitor
deviceCamera	oic.d.camera
deviceClothesDryer	oic.d.dryer
deviceClothesWasher	oic.d.washer
deviceCoffeeMachine	oic.d.coffeemachine
deviceCookerHood	oic.d.cookerhood
deviceCooktop	oic.d.cooktop
deviceDehumidifier	oic.d.dehumidifier
deviceDishWasher	oic.d.dishwasher
deviceDoor	oic.d.door
deviceDoorLock	oic.d.smartlock
deviceElectricVehicleCharger	oic.d.electricvehiclecharger
deviceFan	oic.d.fan
deviceFoodProbe	oic.d.foodprobe
deviceFreezer	oic.d.freezer
deviceGlucosemeter	oic.d.glucosemeter

oneM2M Device Type	OCF Device Type
deviceHumidifier	oic.d.humidifier
deviceKettle	oic.d.kettle
deviceLight	oic.d.light
deviceMicrogeneration	oic.d.energygenerator
deviceMultiFunctionPrinter	oic.d.multifunctionprinter
deviceOutdoorLamp	oic.d.light
deviceOven	oic.d.oven
devicePrinter	oic.d.printer
deviceRefrigerator	oic.d.refrigerator
deviceRobotCleaner	oic.d.robotcleaner
deviceScanner	oic.d.scanner
deviceSecurityPanel	oic.d.securitypanel
deviceSetTopBox	oic.d.stb
deviceSmartElectricMeter	oic.d.electricmeter
deviceSmartPlug	oic.d.smartplug
deviceSteamCloset	oic.d.steamcloset
deviceStorageBattery	oic.d.battery
deviceSwitch	oic.d.switch
deviceTelevision	oic.d.tv
deviceThermostat	oic.d.thermostat
deviceWaterHeater	oic.d.waterheater
deviceWaterValve	oic.d.watervalve
deviceWeightScaleAndBodyCompositionAnalyzer	oic.d.bodyscale
deviceWindowShade	oic.d.blind
deviceThermometer	oic.d.bodythermometer

8 Resource to oneM2M module class equivalence

8.1 Introduction

This clause lists the complete set of applicable oneM2M Module Classes and provides the equivalent OCF Resource Type(s) to which the Module Classes map.

8.2 OneM2M module classes to OCF resources

Table 2 captures the equivalency mapping between oneM2M defined Module Classes and OCF defined Resource Types (see ISO/IEC 30118-4). Detailed Property by Property mappings are provided in clause 9.

Table 2 – oneM2M Module Classes to OCF Resource Type Mapping

oneM2M Module Class	OCF Resource Type
3Dprinter	oic.r.3dprinter
acousticsensor	oic.r.soundpressure
airconjobmode	oic.r.operational.state
airflow	oic.r.airflow
airpurifierjobmode	oic.r.operational.state
airqualitysensor	oic.r.airquality oic.r.switch.binary oic.r.humidity
alarmspeaker	oic.r.audiovolume oic.r.switch.binary oic.r.light.dimming
audioVolume	oic.r.audio
autodocumentfeeder	oic.r.operational.state
battery	oic.r.energy.battery
binaryswitch	oic.r.swtich.binary
boiler	oic.r.sensor
brewing	oic.r.brewing
brightness	oic.r.light.brightness
clock	oic.r.clock
clothesdryerjobmode	oic.r.operational.state
colour	oic.r.colour
coloursaturation	oic.r.colour.saturation

oneM2M Module Class	OCF Resource Type
credentials	oic.r.userinfo
dehumidiiferjobmode	oic.r.operational.state
doorStatus	oic.r.door
electricvehicleconnector	oic.r.vehicle.connector
energyconsumption	oic.r.energy.electrical oic.r.energy.consumption
energygeneration	oic.r.energy.generation
filterinfo	oic.r.consumable oic.r.sensor
foaming	oic.r.foaming
grinder	oic.r.grinder oic.r.switch.binary
heatingzone	oic.r.heatingzone
height	oic.r.height
hotwatersupply	oic.r.switch.binary oic.r.sensor
impactsensor	oic.r.impactsensor
keepwarm	oic.r.time.period
Keypad	oic.r.keypadchar
liquidlevel	oic.r.liquid.level
liquidremaining	oic.r.liquid.level
lock	oic.r.lock
motionSensor	oic.r.sensor.motion oic.r.sensor.props
openlevel	oic.r.openlevel
operationmode	oic.r.switch.binary
overcurrentsensor	oic.r.time.period oic.r.sensor
powersave	oic.r.switch.binary
printqueue	oic.r.printer.queue
pushbutton	oic.r.button

oneM2M Module Class	OCF Resource Type
refrigeration	oic.r.refrigeration
relativeHumidity	oic.r.humidity
robotcleanerjobmode	oic.r.operational.state
steamclosetjobmode	oic.r.operational.state
temperature	oic.r.temperature
uvsensor	oic.r.sensor.radiation.uv
watersensor	oic.r.sensor.water
weight	oic.r.weight

9 Detailed mapping APIs

9.1 Introduction

This clause provides an API and mapping description that aligns with the Derived Modelling syntax described in Derived Models for Interoperability for all Module Classes and Resources that are within scope.

The derived model definitions presented in clause 9 are formatted for readability, and so may appear to have extra line breaks.

9.2 3D printer

9.2.1 Derived model

The derived model: "onem2m.m.3Dprinter".

9.2.2 Property definition

Table 3 provides the detailed per Property mapping for "onem2m.m.3Dprinter".

Table 3 – The property mapping for "onem2m.3Dprinter"

oneM2M Property name	OCF Resource	To OCF	From OCF
memorySize	oic.r.3dprinter	oic.r.3dprinter.memorysize = memorySize	memorySize = oic.r.3dprinter.memorysize
printType	oic.r.3dprinter	oic.r.3dprinter.3dprinttype = printType	printType = oic.r.3dprinter.3dprintype
printSizeX	oic.r.3dprinter	oic.r.3dprinter.printsizex = printSizeX	printSizeX = oic.r.3dprinter.printsizex

oneM2M Property name	OCF Resource	To OCF	From OCF
printSizeZ	oic.r.3dprinter	oic.r.3dprinter.printsizez = printSizeZ	printSizeZ = oic.r.3dprinter.printsizez
network	oic.r.3dprinter	oic.r.3dprinter.wanconnected = network	network = oic.r.3dprinter.wanconnected
printSizeY	oic.r.3dprinter	oic.r.3dprinter.printsizey = printSizeY	printSizeY = oic.r.3dprinter.printsizey

Table 4 provides the details of the Properties that are part of "onem2m.m.3Dprinter".

Table 4 – The properties of "onem2m.3Dprinter"

oneM2M Property name	Type	Required	Description
memorySize	number	yes	Memory Size
printType	string	yes	3D Printer Type
printSizeX	number	yes	Print Size X
printSizeZ	number	yes	Print Size Z
network	boolean	yes	WAN Connected
printSizeY	number	yes	Print Size Y

9.2.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.3Dprinter.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "3D Printer",
  "definitions": {
    "onem2m.m.3Dprinter": {
      "type": "object",
      "properties": {
        "printType": {
          "type": "string",
          "description": "3D Printer Type",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.3dprinter",
            "x-to-ocf": [
              "oic.r.3dprinter.3dprinttype = printType"
            ],
            "x-from-ocf": [
              "printType = oic.r.3dprinter.3dprintype"
            ]
          }
        },
        "printSizeX": {
          "type": "number",
          "description": "Print Size X",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.3dprinter",
            "x-to-ocf": [
              "oic.r.3dprinter.printsizex = printSizeX"
```

```
            ],
            "x-from-ocf": [
              "printSizeX = oic.r.3dprinter.printsizex"
            ]
          }
        },
        "printSizeY": {
          "type": "number",
          "description": "Print Size Y",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.3dprinter",
            "x-to-ocf": [
              "oic.r.3dprinter.printsizey = printSizeY"
            ],
            "x-from-ocf": [
              "printSizeY = oic.r.3dprinter.printsizey"
            ]
          }
        },
        "printSizeZ": {
          "type": "number",
          "description": "Print Size Z",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.3dprinter",
            "x-to-ocf": [
              "oic.r.3dprinter.printsizez = printSizeZ"
            ],
            "x-from-ocf": [
              "printSizeZ = oic.r.3dprinter.printsizez"
            ]
          }
        },
        "network": {
          "type": "boolean",
          "description": "WAN Connected",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.3dprinter",
            "x-to-ocf": [
              "oic.r.3dprinter.wanconnected = network"
            ],
            "x-from-ocf": [
              "network = oic.r.3dprinter.wanconnected"
            ]
          }
        },
        "memorySize": {
          "type": "number",
          "description": "Memory Size",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.3dprinter",
            "x-to-ocf": [
              "oic.r.3dprinter.memorysize = memorySize"
            ],
            "x-from-ocf": [
              "memorySize = oic.r.3dprinter.memorysize"
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.3Dprinter"}
  ],
  "required": [ "printType", "printSizeX", "printSizeY", "printSizeZ", "network", "memorySize" ]
}
```

9.3 Acoustic sensor

9.3.1 Derived model

The derived model: "onem2m.m.acousticsensor".

9.3.2 Property definition

Table 5 provides the detailed per Property mapping for "onem2m.m.acousticsensor".

Table 5 – The property mapping for "onem2m.acousticsensor"

oneM2M Property name	OCF Resource	To OCF	From OCF
loudness	oic.r.soundpressure	oic.r.soundpressure.dba = loudness	loudness = oic.r.soundpressure.dba
acousticStatus	oic.r.soundpressure	oic.r.soundpressure.percentage = acousticStatus	acousticStatus = oic.r.soundpressure.percentage

Table 6 provides the details of the Properties that are part of "onem2m.m.acousticsensor".

Table 6 – The properties of "onem2m.acousticsensor"

oneM2M Property name	Type	Required	Description
loudness	number	yes	The common unit of the sound pressure in dBa.
acousticStatus	integer	no	The rounded percentage of the current sound pressure as compared to the sensitivity range of the sensor. The acousticStatus indicates as follows: (0) No sound ~ (100) Most noisy.

9.3.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.acousticsensor.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Acoustic Sensor",
  "definitions": {
    "onem2m.m.acousticsensor": {
      "type": "object",
      "properties": {
        "loudness": {
          "type": "number",
          "description": "The common unit of the sound pressure in dBa.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.soundpressure",
            "x-to-ocf": [
              "oic.r.soundpressure.dba = loudness"
            ],
            "x-from-ocf": [
```

```
              "loudness = oic.r.soundpressure.dba"
            ]
          }
        },
        "acousticStatus": {
          "type": "integer",
          "description": "The rounded percentage of the current sound pressure as compared to the
sensitivity range of the sensor. The acousticStatus indicates as follows: (0) No sound ~ (100) Most
noisy.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.soundpressure",
            "x-to-ocf": [
              "oic.r.soundpressure.percentage = acousticStatus"
            ],
            "x-from-ocf": [
              "acousticStatus = oic.r.soundpressure.percentage"
           ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.acousticsensor"}
  ],
  "required": [ "loudness" ]
}
```


9.4 AirCon job mode

9.4.1 Derived model

The derived model: "onem2m.m.airconjobmode".

9.4.2 Property definition

Table 7 provides the detailed per Property mapping for "onem2m.m.airconjobmode".

Table 7 – The property mapping for "onem2m.airconjobmode"

oneM2M Property name	OCF Resource	To OCF	From OCF
jobModes	oic.r.operational.state	This does not exist in OCF as all possible operational states are available.	This is an array of integers in oneM2M defined by the current version of the specification as follows:jobModes[1] = 1jobModes[2] = 2jobModes[3] = 3jobModes[4] = 4jobModes[5] = 5jobModes[6] = 6jobModes[7] = 7jobModes[8] = 8
currentJobModeName	oic.r.operational.state	This value does not exist in OCF as it is already accommodated in the currentJobMode property.	Need to translate between the OCF operational state enumerated string and the oneM2M string valueif (oic.r.operational.state.currentJobState == "cooling") { currentJobModeName = "cool"; }if (oic.r.operational.state.currentJobState == "airDry") { currentJobModeName = "airDry"; }if (oic.r.operational.state.currentJobState == "fan" { currentJobModeName = "fan"; }if (oic.r.operational.state.currentJobState == "artificialintelligence") { currentJobModeName = "AI"; }if (oic.r.operational.state.currentJobState == "heating") { currentJobModeName = "heat"; }if (oic.r.operational.state.currentJobState == "cleaning") { currentJobModeName = "airClean"; }if (oic.r.operational.state.currentJobState == "auto") { currentJobModeName = "ACO"; }if (oic.r.operational.state.currentJobState == "aroma") { currentJobModeName = "aroma"; }else { currentJobModeName = ""; }

oneM2M Property name	OCF Resource	To OCF	From OCF
currentJobMode	oic.r.operational.state	Need to translate between the oneM2M integer value and the OCF operational state enumerated stringif (currentJobMode == 1) { oic.r.operational.state.currentJobState == "cooling"; }if (currentJobMode == 2) { oic.r.operational.state.currentJobState == "airDry"; }if (currentJobMode == 3) { oic.r.operational.state.currentJobState == "fan"; }if (currentJobMode == 4) { oic.r.operational.state.currentJobState == "artificialintelligence"; }if (currentJobMode == 5) { oic.r.operational.state.currentJobState == "heating"; }if (currentJobMode == 6) { oic.r.operational.state.currentJobState == "cleaning"; }if (currentJobMode == 7) { oic.r.operational.state.currentJobState == "auto"; }if (currentJobMode == 8) { oic.r.operational.state.currentJobState == "aroma"; }else { oic.r.operational.state.currentJobState == "unknown"; }	Need to translate between the OCF operational state enumerated string and the oneM2M integer valueif (oic.r.operational.state.currentJobState == "cooling") { currentJobMode = 1; }if (oic.r.operational.state.currentJobState == "airDry") { currentJobMode = 2; }if (oic.r.operational.state.currentJobState == "fan") { currentJobMode = 3; }if (oic.r.operational.state.currentJobState == "artificialintelligence") { currentJobMode = 4; }if (oic.r.operational.state.currentJobState == "heating") { currentJobMode = 5; }if (oic.r.operational.state.currentJobState == "cleaning") { currentJobMode = 6; }if (oic.r.operational.state.currentJobState == "auto") { currentJobMode = 7; }if (oic.r.operational.state.currentJobState == "aroma") { currentJobMode = 8; }else { currentJobMode = 0; }

Table 8 provides the details of the Properties that are part of "onem2m.m.airconjobmode".

Table 8 – The properties of "onem2m.airconjobmode"

oneM2M Property name	Type	Required	Description
jobModes	array	yes	List of possible job states the device supports
currentJobModeName	string	no	Name of current job mode in string. This can be used when currentJobMode is vendor-specific.
currentJobMode	integer	yes	Currently active job mode.

9.4.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.airconjobmode.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "AirCon Job Mode",
  "definitions": {
    "onem2m.m.airconjobmode": {
      "type": "object",
      "properties": {
        "currentJobMode": {
          "type": "integer",
          "description": "Currently active job mode.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.operational.state",
            "x-to-ocf": [
              "Need to translate between the oneM2M integer value and the OCF operational state
enumerated string",
              "if ( currentJobMode == 1 ) { oic.r.operational.state.currentJobState == \"cooling\"; }",
              "if ( currentJobMode == 2 ) { oic.r.operational.state.currentJobState == \"airDry\"; }",
              "if ( currentJobMode == 3 ) { oic.r.operational.state.currentJobState == \"fan\"; }",
              "if ( currentJobMode == 4 ) { oic.r.operational.state.currentJobState ==
\"artificialintelligence\"; }",
              "if ( currentJobMode == 5 ) { oic.r.operational.state.currentJobState == \"heating\"; }",
              "if ( currentJobMode == 6 ) { oic.r.operational.state.currentJobState ==
\"cleaning\"; }",
              "if ( currentJobMode == 7 ) { oic.r.operational.state.currentJobState == \"auto\"; }",
              "if ( currentJobMode == 8 ) { oic.r.operational.state.currentJobState == \"aroma\"; }",
              "else { oic.r.operational.state.currentJobState == \"unknown\"; }"
            ],
            "x-from-ocf": [
              "Need to translate between the OCF operational state enumerated string and the oneM2M
integer value",
              "if (oic.r.operational.state.currentJobState == \"cooling\" ) { currentJobMode = 1; }",
              "if (oic.r.operational.state.currentJobState == \"airDry\" ) { currentJobMode = 2; }",
              "if (oic.r.operational.state.currentJobState == \"fan\" { currentJobMode = 3; }",
              "if (oic.r.operational.state.currentJobState == \"artificialintelligence\" )
{ currentJobMode = 4; }",
              "if (oic.r.operational.state.currentJobState == \"heating\" ) { currentJobMode = 5; }",
              "if (oic.r.operational.state.currentJobState == \"cleaning\" ) { currentJobMode = 6; }",
              "if (oic.r.operational.state.currentJobState == \"auto\" ) { currentJobMode = 7; }",
              "if (oic.r.operational.state.currentJobState == \"aroma\" ) { currentJobMode = 8; }",
              "else { currentJobMode = 0; }"
            ]
          }
        },
        "currentJobModeName": {
          "type": "string",
          "description": "Name of current job mode in string. This can be used when currentJobMode is
vendor-specific.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.operational.state",
            "x-to-ocf": [
              "This value does not exist in OCF as it is already accommodated in the currentJobMode
property."
            ],
            "x-from-ocf": [
              "Need to translate between the OCF operational state enumerated string and the oneM2M
string value",
              "if (oic.r.operational.state.currentJobState == \"cooling\" ) { currentJobModeName =
\"cool\"; }",
              "if (oic.r.operational.state.currentJobState == \"airDry\" ) { currentJobModeName =
\"airDry\"; }",
              "if (oic.r.operational.state.currentJobState == \"fan\" { currentJobModeName =
\"fan\"; }",
              "if (oic.r.operational.state.currentJobState == \"artificialintelligence\" )
{ currentJobModeName = \"AI\"; }",
              "if (oic.r.operational.state.currentJobState == \"heating\" ) { currentJobModeName =
\"heat\"; }",
              "if (oic.r.operational.state.currentJobState == \"cleaning\" ) { currentJobModeName =
\"airClean\"; }",
              "if (oic.r.operational.state.currentJobState == \"auto\" ) { currentJobModeName =
\"ACO\"; }",
              "if (oic.r.operational.state.currentJobState == \"aroma\" ) { currentJobModeName =
\"aroma\"; }",
              "else { currentJobModeName = \"\"; }"
```



```
            ]
          }
        },
        "jobModes": {
          "type": "array",
          "description": "List of possible job states the device supports",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.operational.state",
            "x-to-ocf": [
              "This does not exist in OCF as all possible operational states are available."
            ],
            "x-from-ocf": [
              "This is an array of integers in oneM2M defined by the current version of the
specification as follows:",
              "jobModes[1] = 1",
              "jobModes[2] = 2",
              "jobModes[3] = 3",
              "jobModes[4] = 4",
              "jobModes[5] = 5",
              "jobModes[6] = 6",
              "jobModes[7] = 7",
              "jobModes[8] = 8"
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.airconjobmode"}
  ],
  "required": [ "currentJobMode", "jobModes" ]
}
```

9.5 Airflow

9.5.1 Derived model

The derived model: "onem2m.m.airflow".

9.5.2 Property definition

Table 9 provides the detailed per Property mapping for "onem2m.m.airflow".

Table 9 – The property mapping for "onem2m.airflow"

oneM2M Property name	OCF Resource	To OCF	From OCF
minSpeed	oic.r.airflow	range[0] = minSpeed	minSpeed = range[0]otherwise: minSpeed = 0
supportedVerticalDirection	oic.r.airflow	supporteddirections = supportedVerticalDirection	supportedVerticalDirection = supporteddirections
maxSpeed	oic.r.airflow	range[1] = maxSpeed	maxSpeed = range[1]otherwise: maxSpeed = 100
horizontalDirection	oic.r.airflow	direction = horizontalDirection	horizontalDirection = direction

oneM2M Property name	OCF Resource	To OCF	From OCF
autoMode	oic.r.airflow	if autoMode = true, ocf.automode = Onif autoMode = fals, ocf.automode = Off_comment: is is correct way to map boolean to enum?	if ocf.automode = On, autoMode = trueif ocf.automode = Off, autoMode = false
speed	oic.r.airflow	ocf.speed = speed	speed = ocf.speed
verticalDirection	oic.r.airflow	direction = verticalDirection	verticalDirection = direction_comment: Is 1-to-1 mapping possible from string to enum? what if enum doesn't contain the converted string from OCF?
supportedhorizontalDirection	oic.r.airflow	supporteddirections = supportedhorizontalDirection	supportedhorizontalDirection = supporteddirections

Table 10 provides the details of the Properties that are part of "onem2m.m.airflow".

Table 10 – The properties of "onem2m.airflow"

oneM2M Property name	Type	Required	Description
minSpeed	integer	no	Min value for the speed level. If not present, the default is 0.
supportedVerticalDirection	array	no	List of supported vertical direction.
maxSpeed	integer	no	Max value for the speed level. If not present, the default is 100.
horizontalDirection		no	The horizontal directionality of the air flow.
autoMode	boolean	no	Status of the automode feature. If on speed is set by the device.

oneM2M Property name	Type	Required	Description
speed	integer	yes	current speed level in the range of [minSpeed, maxSpeed]
verticalDirection		no	The vertical directionality of the air flow.
supportedhorizontalDirection	array	no	List of supported horizontal direction.

9.5.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.airflow.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Airflow",
  "definitions": {
    "onem2m.m.airflow": {
      "type": "object",
      "properties": {
        "speed": {
          "type": "integer",
          "description": "current speed level in the range of [minSpeed, maxSpeed]",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.airflow",
            "x-to-ocf": [
              "ocf.speed = speed"
            ],
            "x-from-ocf": [
              "speed = ocf.speed"
            ]
          }
        },
              "minSpeed": {
          "type": "integer",
          "description": "Min value for the speed level. If not present, the default is 0.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.airflow",
            "x-to-ocf": [
              "range[0] = minSpeed"
            ],
            "x-from-ocf": [
              "minSpeed = range[0]",
              "otherwise: minSpeed = 0"
            ]
          }
        },
              "maxSpeed": {
          "type": "integer",
          "description": "Max value for the speed level. If not present, the default is 100.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.airflow",
            "x-to-ocf": [
              "range[1] = maxSpeed"
            ],
            "x-from-ocf": [
              "maxSpeed = range[1]",
              "otherwise: maxSpeed = 100"
            ]
          }
        },
              "verticalDirection": {
          "enum": ["auto", "center", "up", "down"],
          "description": "The vertical directionality of the air flow.",
          "x-ocf-conversion": {
```

```
            "x-ocf-alias": "oic.r.airflow",
            "x-to-ocf": [
              "direction = verticalDirection"
            ],
            "x-from-ocf": [
              "verticalDirection = direction",
                              "_comment: Is 1-to-1 mapping possible from string to enum? what if enum
doesn't contain the converted string from OCF?"
            ]
          }
        },
                "supportedVerticalDirection": {
          "type": "array",
          "items": {
                        "enum": ["auto", "center", "up", "down"]
                },
                "description": "List of supported vertical direction.",
          "readOnly": true,
                "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.airflow",
            "x-to-ocf": [
              "supporteddirections = supportedVerticalDirection"
            ],
            "x-from-ocf": [
              "supportedVerticalDirection = supporteddirections"
            ]
          }
        },
                "horizontalDirection": {
          "enum": ["auto", "center", "left", "right"],
          "description": "The horizontal directionality of the air flow.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.airflow",
            "x-to-ocf": [
              "direction = horizontalDirection"
            ],
            "x-from-ocf": [
              "horizontalDirection = direction"
            ]
          }
        },
                "supportedhorizontalDirection": {
          "type": "array",
          "items": {
                        "enum": ["auto", "center", "left", "right"]
                },
                "description": "List of supported horizontal direction.",
          "readOnly": true,
                "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.airflow",
            "x-to-ocf": [
              "supporteddirections = supportedhorizontalDirection"
            ],
            "x-from-ocf": [
              "supportedhorizontalDirection = supporteddirections"
            ]
          }
        },
                "autoMode": {
          "type": "boolean",
          "description": "Status of the automode feature. If on speed is set by the device.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.airflow",
            "x-to-ocf": [
              "if autoMode = true, ocf.automode = On",
                              "if autoMode = fals, ocf.automode = Off",
                              "_comment: is is correct way to map boolean to enum?"
            ],
            "x-from-ocf": [
              "if ocf.automode = On, autoMode = true",
                          "if ocf.automode = Off, autoMode = false"
            ]
          }
        }
      }
    }
  },
```

```
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.airflow"}
  ],
  "required": [ "speed" ]
}
```

9.6 Air purifier job mode

9.6.1 Derived model

The derived model: "onem2m.m.airpurifierjobmode".

9.6.2 Property definition

Table 11 provides the detailed per Property mapping for "onem2m.m.airpurifierjobmode".

Table 11 – The property mapping for "onem2m.airpurifierjobmode"

oneM2M Property name	OCF Resource	To OCF	From OCF
currentJobMode	oic.r.operational.state	Need to translate between the oneM2M integer value and the OCF operational state enumerated stringif (currentJobMode == 1) { oic.r.operational.state.currentJobState == "normal"; }if (currentJobMode == 2) { oic.r.operational.state.currentJobState == "sleeping"; }if (currentJobMode == 3) { oic.r.operational.state.currentJobState == "silent"; }if (currentJobMode == 4) { oic.r.operational.state.currentJobState == "wet"; }if (currentJobMode == 5) { oic.r.operational.state.currentJobState == "circulating"; }if (currentJobMode == 6) { oic.r.operational.state.currentJobState == "dual"; }if (currentJobMode == 7) { oic.r.operational.state.currentJobState == "auto"; }else { oic.r.operational.state.currentJobState == "unknown"; }	Need to translate between the OCF operational state enumerated string and the oneM2M integer valueif (oic.r.operational.state.currentJobState == "normal") { currentJobMode = 1; }if (oic.r.operational.state.currentJobState == "sleeping") { currentJobMode = 2; }if (oic.r.operational.state.currentJobState == "silent" { currentJobMode = 3; }if (oic.r.operational.state.currentJobState == "wet") { currentJobMode = 4; }if (oic.r.operational.state.currentJobState == "circulating") { currentJobMode = 5; }if (oic.r.operational.state.currentJobState == "dual") { currentJobMode = 6; }if (oic.r.operational.state.currentJobState == "auto") { currentJobMode = 7; }else { currentJobMode = 0; }

oneM2M Property name	OCF Resource	To OCF	From OCF
jobModes	oic.r.operational.state	This does not exist in OCF as all possible operational states are available.	This is an array of integers in oneM2M defined by the current version of the specification as follows:jobModes[1] = 1jobModes[2] = 2jobModes[3] = 3jobModes[4] = 4jobModes[5] = 5jobModes[6] = 6jobModes[7] = 7
currentJobModeName	oic.r.operational.state	This value does not exist in OCF as it is already accommodated in the currentJobMode property.	Need to translate between the OCF operational state enumerated string and the oneM2M string valueif (oic.r.operational.state.currentJobState == "normal") { currentJobModeName = "normalClean"; }if (oic.r.operational.state.currentJobState == "sleeping") { currentJobModeName = "sleep"; }if (oic.r.operational.state.currentJobState == "silent" { currentJobModeName = "silent"; }if (oic.r.operational.state.currentJobState == "wet") { currentJobModeName = "wet"; }if (oic.r.operational.state.currentJobState == "circulating") { currentJobModeName = "circulate"; }if (oic.r.operational.state.currentJobState == "dual") { currentJobModeName = "dual"; }if (oic.r.operational.state.currentJobState == "auto") { currentJobModeName = "auto"; }else { currentJobModeName = ""; }

Table 12 provides the details of the Properties that are part of "onem2m.m.airpurifierjobmode".

Table 12 – The properties of "onem2m.airpurifierjobmode"

oneM2M Property name	Type	Required	Description
currentJobMode	integer	yes	Currently active job mode.
jobModes	array	yes	List of possible job states the device supports
currentJobModeName	string	no	Name of current job mode in string. This can be used when currentJobMode is vendor-specific.

9.6.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.airpurifierjobmode.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Air Purifier Job Mode",
  "definitions": {
    "onem2m.m.airpurifierjobmode": {
      "type": "object",
      "properties": {
        "currentJobMode": {
          "type": "integer",
          "description": "Currently active job mode.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.operational.state",
            "x-to-ocf": [
              "Need to translate between the oneM2M integer value and the OCF operational state
enumerated string",
              "if ( currentJobMode == 1 ) { oic.r.operational.state.currentJobState == \"normal\"; }",
              "if ( currentJobMode == 2 ) { oic.r.operational.state.currentJobState ==
\"sleeping\"; }",
              "if ( currentJobMode == 3 ) { oic.r.operational.state.currentJobState == \"silent\"; }",
              "if ( currentJobMode == 4 ) { oic.r.operational.state.currentJobState == \"wet\"; }",
              "if ( currentJobMode == 5 ) { oic.r.operational.state.currentJobState ==
\"circulating\"; }",
              "if ( currentJobMode == 6 ) { oic.r.operational.state.currentJobState == \"dual\"; }",
              "if ( currentJobMode == 7 ) { oic.r.operational.state.currentJobState == \"auto\"; }",
              "else { oic.r.operational.state.currentJobState == \"unknown\"; }"
            ],
            "x-from-ocf": [
              "Need to translate between the OCF operational state enumerated string and the oneM2M
integer value",
              "if (oic.r.operational.state.currentJobState == \"normal\" ) { currentJobMode = 1; }",
              "if (oic.r.operational.state.currentJobState == \"sleeping\" ) { currentJobMode = 2; }",
              "if (oic.r.operational.state.currentJobState == \"silent\" ) { currentJobMode = 3; }",
              "if (oic.r.operational.state.currentJobState == \"wet\" ) { currentJobMode = 4; }",
              "if (oic.r.operational.state.currentJobState == \"circulating\" ) { currentJobMode =
5; }",
              "if (oic.r.operational.state.currentJobState == \"dual\" ) { currentJobMode = 6; }",
              "if (oic.r.operational.state.currentJobState == \"auto\" ) { currentJobMode = 7; }",
              "else { currentJobMode = 0; }"
            ]
          }
        },
        "currentJobModeName": {
          "type": "string",
          "description": "Name of current job mode in string. This can be used when currentJobMode is
vendor-specific.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.operational.state",
```

```
            "x-to-ocf": [
              "This value does not exist in OCF as it is already accommodated in the currentJobMode
property."
            ],
            "x-from-ocf": [
              "Need to translate between the OCF operational state enumerated string and the oneM2M
string value",
              "if (oic.r.operational.state.currentJobState == \"normal\" ) { currentJobModeName =
\"normalClean\"; }",
              "if (oic.r.operational.state.currentJobState == \"sleeping\" ) { currentJobModeName =
\"sleep\"; }",
              "if (oic.r.operational.state.currentJobState == \"silent\" { currentJobModeName =
\"silent\"; }",
              "if (oic.r.operational.state.currentJobState == \"wet\" ) { currentJobModeName =
\"wet\"; }",
              "if (oic.r.operational.state.currentJobState == \"circulating\" ) { currentJobModeName =
\"circulate\"; }",
              "if (oic.r.operational.state.currentJobState == \"dual\" ) { currentJobModeName =
\"dual\"; }",
              "if (oic.r.operational.state.currentJobState == \"auto\" ) { currentJobModeName =
\"auto\"; }",
              "else { currentJobModeName = \"\"; }"
            ]
          }
        },
        "jobModes": {
          "type": "array",
          "description": "List of possible job states the device supports",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.operational.state",
            "x-to-ocf": [
              "This does not exist in OCF as all possible operational states are available."
            ],
            "x-from-ocf": [
              "This is an array of integers in oneM2M defined by the current version of the
specification as follows:",
              "jobModes[1] = 1",
              "jobModes[2] = 2",
              "jobModes[3] = 3",
              "jobModes[4] = 4",
              "jobModes[5] = 5",
              "jobModes[6] = 6",
              "jobModes[7] = 7"
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.airconjobmode"}
  ],
  "required": [ "currentJobMode", "jobModes" ]
}
```


9.7 Air quality sensor

9.7.1 Derived model

The derived model: "onem2m.m.airqualitysensor".

9.7.2 Property definition

Table 13 provides the detailed per Property mapping for "onem2m.m.airqualitysensor".

Table 13 – The property mapping for "onem2m.airqualitysensor"

oneM2M Property name	OCF Resource	To OCF	From OCF
sensorOdor	oic.r.airquality	oic.r.airquality.contaminantvalue = sensorOdoroic.r.airquality.contaminanttype = "Odor"oic.r.airquality.valuetype = "Measured"	sensorOdor = oic.r.airquality.contaminantvalue
VOC	oic.r.airquality	oic.r.airquality.contaminantvalue = VOCoic.r.airquality.contaminanttype = "VOC"oic.r.airquality.valuetype = "Measured"	VOC = oic.r.airquality.contaminantvalue
monitoringEnabled	oic.r.switch.binary	if monitoringEnabled == 0oic.r.switch.binary.value = falseif monitoringEnabled == 1oic.r.switch.binary.value = true	if oic.r.switch.binary.value == falsemonitoringEnabled = 0if oic.r.switch.binary.value == truemonitoringEnabled = 1
sensorHumidity	oic.r.humidity	oic.r.humidity.humidity = sensorHumidity	sensorHumidity = oic.r.humidity.humidity
sensorPM2	oic.r.airquality	oic.r.airquality.contaminantvalue = sensorPM2oic.r.airquality.contaminanttype = "PM2.5"oic.r.airquality.valuetype = "Measured"	sensorPM2 = oic.r.airquality.contaminantvalue
sensorPM10	oic.r.airquality	oic.r.airquality.contaminantvalue = sensorPM10oic.r.airquality.contaminanttype = "PM10"oic.r.airquality.valuetype = "Measured"	sensorPM10 = oic.r.airquality.contaminantvalue
CO	oic.r.airquality	oic.r.airquality.contaminantvalue = COoic.r.airquality.contaminanttype = "CO"oic.r.airquality.valuetype = "Measured"	CO = oic.r.airquality.contaminantvalue
CH2O	oic.r.airquality	oic.r.airquality.contaminantvalue = CH2Ooic.r.airquality.contaminanttype = "CH2O"oic.r.airquality.valuetype = "Measured"	CH2O = oic.r.airquality.contaminantvalue

oneM2M Property name	OCF Resource	To OCF	From OCF
CO2	oic.r.airquality	oic.r.airquality.contaminantvalue = CO2oic.r.airquality.contaminanttype = "CO2"oic.r.airquality.valuetype = "Measured"	CO2 = oic.r.airquality.contaminantvalue
sensorPM1	oic.r.airquality	oic.r.airquality.contaminantvalue = sensorPM1oic.r.airquality.contaminanttype = "PM1"oic.r.airquality.valuetype = "Measured"	sensorPM1 = oic.r.airquality.contaminantvalue

Table 14 provides the details of the Properties that are part of "onem2m.m.airqualitysensor".

Table 14 – The properties of "onem2m.airqualitysensor"

oneM2M Property name	Type	Required	Description
sensorOdor	integer	no	Concentration of odor that reflects air pollution. Minimum value is 0, and maximum is 1000.
VOC	integer	no	This value indicates VOC (Volatile Organic Compounds) in ppm (parts per million)
monitoringEnabled	boolean	no	1 allows monitoring this resource whereas 0 does not.
sensorHumidity	integer	no	Measured humidity. Minimum value is 0, and maximum is 100.
sensorPM2	integer	no	Concentration of Particle Matter under 2.5um. Minimum value is 0, and maximum is 1000.
sensorPM10	integer	no	Concentration of Particle Matter under 10um. Minimum value is 0, and maximum is 1000.
CO	integer	no	This value indicates CO in ppm (parts per million)

oneM2M Property name	Type	Required	Description
CH2O	integer	no	This value indicates CH2O in ppm (parts per million)
CO2	integer	no	This value indicates CO2 in ppm (parts per million)
sensorPM1	integer	no	Concentration of Particle Matter under 1um. Minimum value is 0, and maximum is 1000.

9.7.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.airqualitysensor.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Air Quality Sensor",
  "definitions": {
    "onem2m.m.airqualitysensor": {
      "type": "object",
      "properties": {
        "sensorPM1": {
          "type": "integer",
          "description": "Concentration of Particle Matter under 1um. Minimum value is 0, and maximum
is 1000.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.airquality",
            "x-to-ocf": [
              "oic.r.airquality.contaminantvalue = sensorPM1",
              "oic.r.airquality.contaminanttype = \"PM1\"",
              "oic.r.airquality.valuetype = \"Measured\""
            ],
            "x-from-ocf": [
              "sensorPM1 = oic.r.airquality.contaminantvalue"
            ]
          }
        },
        "sensorPM2": {
          "type": "integer",
          "description": "Concentration of Particle Matter under 2.5um. Minimum value is 0, and maximum
is 1000.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.airquality",
            "x-to-ocf": [
              "oic.r.airquality.contaminantvalue = sensorPM2",
              "oic.r.airquality.contaminanttype = \"PM2.5\"",
              "oic.r.airquality.valuetype = \"Measured\""
            ],
            "x-from-ocf": [
              "sensorPM2 = oic.r.airquality.contaminantvalue"
            ]
          }
        },
        "sensorPM10": {
          "type": "integer",
          "description": "Concentration of Particle Matter under 10um. Minimum value is 0, and maximum
is 1000.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.airquality",
            "x-to-ocf": [
              "oic.r.airquality.contaminantvalue = sensorPM10",
              "oic.r.airquality.contaminanttype = \"PM10\"",
```

```
              "oic.r.airquality.valuetype = \"Measured\""
            ],
            "x-from-ocf": [
              "sensorPM10 = oic.r.airquality.contaminantvalue"
            ]
          }
        },
        "sensorOdor": {
          "type": "integer",
          "description": "Concentration of odor that reflects air pollution. Minimum value is 0, and
maximum is 1000.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.airquality",
            "x-to-ocf": [
              "oic.r.airquality.contaminantvalue = sensorOdor",
              "oic.r.airquality.contaminanttype = \"Odor\"",
              "oic.r.airquality.valuetype = \"Measured\""
            ],
            "x-from-ocf": [
              "sensorOdor = oic.r.airquality.contaminantvalue"
            ]
          }
        },
        "sensorHumidity": {
          "type": "integer",
          "description": "Measured humidity. Minimum value is 0, and maximum is 100.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.humidity",
            "x-to-ocf": [
              "oic.r.humidity.humidity = sensorHumidity"
            ],
            "x-from-ocf": [
              "sensorHumidity = oic.r.humidity.humidity"
            ]
          }
        },
        "monitoringEnabled": {
          "type": "boolean",
          "description": "1 allows monitoring this resource whereas 0 does not.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.switch.binary",
            "x-to-ocf": [
              "if monitoringEnabled == 0",
                 "oic.r.switch.binary.value = false",
              "if monitoringEnabled == 1",
                 "oic.r.switch.binary.value = true"
            ],
            "x-from-ocf": [
              "if oic.r.switch.binary.value == false",
                 "monitoringEnabled = 0",
              "if oic.r.switch.binary.value == true",
                 "monitoringEnabled = 1"
            ]
          }
        },
        "CO2": {
          "type": "integer",
          "description": "This value indicates CO2 in ppm (parts per million)",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.airquality",
            "x-to-ocf": [
              "oic.r.airquality.contaminantvalue = CO2",
              "oic.r.airquality.contaminanttype = \"CO2\"",
              "oic.r.airquality.valuetype = \"Measured\""
            ],
            "x-from-ocf": [
              "CO2 = oic.r.airquality.contaminantvalue"
            ]
          }
        },
        "CO": {
          "type": "integer",
          "description": "This value indicates CO in ppm (parts per million)",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.airquality",
            "x-to-ocf": [
              "oic.r.airquality.contaminantvalue = CO",
```

```
              "oic.r.airquality.contaminanttype = \"CO\"",
              "oic.r.airquality.valuetype = \"Measured\""
            ],
            "x-from-ocf": [
              "CO = oic.r.airquality.contaminantvalue"
            ]
          }
        },
        "CH2O": {
          "type": "integer",
          "description": "This value indicates CH2O in ppm (parts per million)",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.airquality",
            "x-to-ocf": [
              "oic.r.airquality.contaminantvalue = CH2O",
              "oic.r.airquality.contaminanttype = \"CH2O\"",
              "oic.r.airquality.valuetype = \"Measured\""
            ],
            "x-from-ocf": [
              "CH2O = oic.r.airquality.contaminantvalue"
            ]
          }
        },
        "VOC": {
          "type": "integer",
          "description": "This value indicates VOC (Volatile Organic Compounds) in ppm (parts per
million)",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.airquality",
            "x-to-ocf": [
              "oic.r.airquality.contaminantvalue = VOC",
              "oic.r.airquality.contaminanttype = \"VOC\"",
              "oic.r.airquality.valuetype = \"Measured\""
            ],
            "x-from-ocf": [
              "VOC = oic.r.airquality.contaminantvalue"
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.airqualitysensor"}
  ],
  "required": [ ]
}
```


9.8 Alarm speaker

9.8.1 Derived model

The derived model: "onem2m.m.alarmspeaker".

9.8.2 Property definition

Table 15 provides the detailed per Property mapping for "onem2m.m.alarmspeaker".

Table 15 – The property mapping for "onem2m.alarmspeaker"

oneM2M Property name	OCF Resource	To OCF	From OCF
alarmStatus	oic.r.switch.binary	oic.r.switch.binary.value = alarmStatus	alarmStatus = oic.r.switch.binary.value
tone	oic.r.audiovolume	oic.r.audio.volume = tone * 20	tone = oic.r.audio.volume / 20
Light	oic.r.light.dimming	oic.r.light.dimming = Light	Light = oic.r.light.dimming

Table 16 provides the details of the Properties that are part of "onem2m.m.alarmspeaker".

Table 16 – The properties of "onem2m.alarmspeaker"

oneM2M Property name	Type	Required	Description
alarmStatus	boolean	yes	true indicates the alarm start while false indicates the alarm stop.
tone	integer	no	Representing the tones of the alarm
Light	integer	no	Representing the lighting mode of the alarm.

9.8.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.alarmspeaker.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Alarm Speaker",
  "definitions": {
    "onem2m.m.alarmspeaker": {
      "type": "object",
      "properties": {
        "tone": {
          "type": "integer",
          "description": "Representing the tones of the alarm",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.audiovolume",
            "x-to-ocf": [
              "oic.r.audio.volume = tone * 20"
            ],
            "x-from-ocf": [
              "tone = oic.r.audio.volume / 20"
            ]
          }
        },
        "Light": {
          "type": "integer",
          "description": "Representing the lighting mode of the alarm.",
          "x-ocf-conversion": {
```

```
            "x-ocf-alias": "oic.r.light.dimming",
            "x-to-ocf": [
              "oic.r.light.dimming = Light"
            ],
            "x-from-ocf": [
              "Light = oic.r.light.dimming"
            ]
          }
        },
        "alarmStatus": {
          "type": "boolean",
          "description": "true indicates the alarm start while false indicates the alarm stop.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.switch.binary",
            "x-to-ocf": [
              "oic.r.switch.binary.value = alarmStatus"
            ],
            "x-from-ocf": [
              "alarmStatus = oic.r.switch.binary.value"
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.airqualitysensor"}
  ],
  "required": [ "alarmStatus" ]
}
```

9.9 Audio volume

9.9.1 Derived model

The derived model: "onem2m.m.audioVolume".

9.9.2 Property definition

Table 17 provides the detailed per Property mapping for "onem2m.m.audioVolume".

Table 17 – The property mapping for "onem2m.audioVolume"

oneM2M Property name	OCF Resource	To OCF	From OCF
muteEnabled	oic.r.audio	oic.r.audio.mute = muteEnabled	muteEnabled = oic.r.audio.mute
stepValue	oic.r.audio	oic.r.audio.step = stepValue	stepValue = oic.r.audio.step
maxValue	oic.r.audio	oic.r.audio.range[0] = 0oic.r.audio.range[1] = maxValue	maxValue = oic.r.audio.range[1]otherwise: maxvalue = 100
volumePercentage	oic.r.audio	oic.r.audio.volume = volumePercentage	volumePercentage = oic.r.audio.volume

Table 18 provides the details of the Properties that are part of "onem2m.m.audioVolume".

Table 18 – The properties of "onem2m.audioVolume"

oneM2M Property name	Type	Required	Description
muteEnabled	boolean	yes	The current status of the mute enablement
stepValue	integer	no	Step value used by the 'UpVolume' and 'DownVolume' actions
maxValue	integer	no	Maximum value allowed for Volume. maxValue is 100 by default if 'maxValue' is not provided
volumePercentage	number	yes	The rounded percentage of the current volume

9.9.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.audioVolume.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Audio Volume",
  "definitions": {
    "onem2m.m.audioVolume": {
      "type": "object",
      "properties": {
        "volumePercentage": {
          "type": "number",
          "description": "The rounded percentage of the current volume",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.audio",
            "x-to-ocf": [
              "oic.r.audio.volume = volumePercentage"
            ],
            "x-from-ocf": [
              "volumePercentage = oic.r.audio.volume"
            ]
          }
        },
        "muteEnabled": {
          "type": "boolean",
          "description": "The current status of the mute enablement",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.audio",
            "x-to-ocf": [
              "oic.r.audio.mute = muteEnabled"
            ],
            "x-from-ocf": [
              "muteEnabled = oic.r.audio.mute"
            ]
          }
        },
        "stepValue": {
          "type": "integer",
          "description": "Step value used by the 'UpVolume' and 'DownVolume' actions",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.audio",
            "x-to-ocf": [
```



```
              "oic.r.audio.step = stepValue"
            ],
            "x-from-ocf": [
              "stepValue = oic.r.audio.step"
            ]
          }
        },
        "maxValue": {
          "type": "integer",
          "description": "Maximum value allowed for Volume. maxValue is 100 by default if 'maxValue' is
not provided",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.audio",
            "x-to-ocf": [
              "oic.r.audio.range[0] = 0",
              "oic.r.audio.range[1] = maxValue"
            ],
            "x-from-ocf": [
              "maxValue = oic.r.audio.range[1]",
              "otherwise: maxvalue = 100"
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.audioVolume"}
  ],
  "required": [ "volumePercentage", "muteEnabled" ]
}
```


9.10 Auto document feeder

9.10.1 Derived model

The derived model: "onem2m.m.autodocumentfeeder".

9.10.2 Property definition

Table 19 provides the detailed per Property mapping for "onem2m.m.autodocumentfeeder".

Table 19 – The property mapping for "onem2m.autodocumentfeeder"

oneM2M Property name	OCF Resource	To OCF	From OCF
adfStates	oic.r.operational.state	This is an array of strings in OCF and an array of integers in oneM2M. For each element in the source array, do the assignment into the same position in the destination array.oic.r.operational.state.jobStates[i] = adfStates[i]	This is an array of strings in OCF and an array of integers in oneM2M. For each element in the source array, do the assignment into the same position in the destination array.adfStates[i] = oic.r.operational.state.jobStates[i]
currentAdfState	oic.r.operational.state	oic.r.operational.state.jobState = currentAdfState	currentAdfState = oic.r.operational.state.jobState

Table 20 provides the details of the Properties that are part of "onem2m.m.autodocumentfeeder".

Table 20 – The properties of "onem2m.m.autodocumentfeeder"

oneM2M Property name	Type	Required	Description
adfStates	array	yes	List of possible adf states the device supports
currentAdfState	integer	yes	Currently active adf(auto document feeder) state.

9.10.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.autodocumentfeeder.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Auto Document Feeder",
  "definitions": {
    "onem2m.m.autodocumentfeeder": {
      "type": "object",
      "properties": {
        "currentAdfState": {
          "type": "integer",
          "description": "Currently active adf(auto document feeder) state.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.operational.state",
            "x-to-ocf": [
              "oic.r.operational.state.jobState = currentAdfState"
            ],
            "x-from-ocf": [
              "currentAdfState = oic.r.operational.state.jobState"
            ]
          }
        },
        "adfStates": {
          "type": "array",
          "description": "List of possible adf states the device supports",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.operational.state",
            "x-to-ocf": [
              "This is an array of strings in OCF and an array of integers in oneM2M. For each element
in the source array, do the assignment into the same position in the destination array.",
              "oic.r.operational.state.jobStates[i] = adfStates[i]"
            ],
            "x-from-ocf": [
              "This is an array of strings in OCF and an array of integers in oneM2M. For each element
in the source array, do the assignment into the same position in the destination array.",
              "adfStates[i] = oic.r.operational.state.jobStates[i]"
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.autodocumentfeeder"}
  ],
  "required": [ "currentAdfState","adfStates" ]
}
```

9.11 Battery

9.11.1 Derived model

The derived model: "onem2m.m.battery".

9.11.2 Property definition

Table 21 provides the detailed per Property mapping for "onem2m.m.battery".

Table 21 – The property mapping for "onem2m.m.battery"

oneM2M Property name	OCF Resource	To OCF	From OCF
material	oic.r.energy.battery	oic.r.batterymaterial.material = materialDirect translation is difficult as OCF has declared an enumeration of strings where oneM2M has a free-form string. Translation code will need to determine which oneM2M strings can be mapped to the OCF enumerated values in oic.r.batterymaterial	material = oic.r.batterymaterial.material[INDEX]
electricEnergy	oic.r.energy.battery	oic.r.energy.electrical.current = electricEnergy	electricEnergy = oic.r.energy.electrical.current
charging	oic.r.energy.battery	oic.r.energy.battery.charging = charging	charging = oic.r.energy.battery.charging
discharging	oic.r.energy.battery	oic.r.energy.battery.discharging = discharging	discharging = oic.r.energy.battery.discharging
capacity	oic.r.energy.battery	oic.r.energy.battery.capacity = capacity / 1000	capacity = oic.r.energy.battery.capacity * 1000
level	oic.r.energy.battery	oic.r.energy.battery.charge = level	level = oic.r.energy.battery.charge
batteryThreshold	oic.r.energy.battery	oic.r.energy.battery.batterythreshold = batteryThreshold	batteryThreshold = oic.r.energy.battery.batterythreshold
voltage	oic.r.energy.battery	oic.r.energy.electrical.voltage = voltage	voltage = oic.r.energy.electrical.voltage
lowBattery	oic.r.energy.battery	oic.r.energy.battery.lowbattery = lowBattery	lowBattery = oic.r.energy.battery.lowbattery

Table 22 provides the details of the Properties that are part of "onem2m.m.battery".

Table 22 – The properties of "onem2m.m.battery"

oneM2M Property name	Type	Required	Description
material	string	no	The material of the cell (for example lithium ion, nickel and lead
electricEnergy	integer	no	Rated electric energy. The unit of measure is ampere (A)
charging	boolean	no	The status of charging. 'True' indicates enabled, and ''False' indicates not enabled
discharging	boolean	no	The status of discharging. 'True' indicates charging, and 'False' indicates not charging
capacity	integer	no	The total capacity of battery in mAh
level	integer	yes	The rounded percentage of the current charging level of a battery in the range of [0, 100]
batteryThreshold	integer	no	When a battery's 'level' is less than 'batteryThreshold' then 'lowBattery' is set to 'True'. This datapoint can be used to raise an alarm, depending on the implementation
voltage	integer	no	Rated voltage. The unit of measure is volts (V)
lowBattery	boolean	no	To indicate that the battery is on a low charge level

9.11.3 Derived model definition


```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.battery.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Battery",
  "definitions": {
    "onem2m.m.battery": {
      "type": "object",
      "properties": {
        "level": {
          "type": "integer",
          "description": "The rounded percentage of the current charging level of a battery in the
range of [0, 100]",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.energy.battery",
            "x-to-ocf": [
              "oic.r.energy.battery.charge = level"
            ],
            "x-from-ocf": [
              "level = oic.r.energy.battery.charge"
            ]
          }
        },
        "capacity": {
          "type": "integer",
          "description": "The total capacity of battery in mAh",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.energy.battery",
            "x-to-ocf": [
              "oic.r.energy.battery.capacity = capacity / 1000"
            ],
            "x-from-ocf": [
              "capacity = oic.r.energy.battery.capacity * 1000"
            ]
          }
        },
        "charging": {
          "type": "boolean",
          "description": "The status of charging. 'True' indicates enabled, and ''False' indicates not
enabled",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.energy.battery",
            "x-to-ocf": [
              "oic.r.energy.battery.charging = charging"
            ],
            "x-from-ocf": [
              "charging = oic.r.energy.battery.charging"
            ]
          }
        },
        "discharging": {
          "type": "boolean",
          "description": "The status of discharging. 'True' indicates charging, and 'False' indicates
not charging",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.energy.battery",
            "x-to-ocf": [
              "oic.r.energy.battery.discharging = discharging"
            ],
            "x-from-ocf": [
              "discharging = oic.r.energy.battery.discharging"
            ]
          }
        },
        "lowBattery": {
          "type": "boolean",
          "description": "To indicate that the battery is on a low charge level",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.energy.battery",
            "x-to-ocf": [
              "oic.r.energy.battery.lowbattery = lowBattery"
            ],
            "x-from-ocf": [
              "lowBattery = oic.r.energy.battery.lowbattery"
```

```
            ]
          }
        },
        "batteryThreshold": {
          "type": "integer",
          "description": "When a battery's 'level' is less than 'batteryThreshold' then 'lowBattery' is
set to 'True'. This datapoint can be used to raise an alarm, depending on the implementation",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.energy.battery",
            "x-to-ocf": [
              "oic.r.energy.battery.batterythreshold = batteryThreshold"
            ],
            "x-from-ocf": [
              "batteryThreshold = oic.r.energy.battery.batterythreshold"
            ]
          }
        },
        "electricEnergy": {
          "type": "integer",
          "description": "Rated electric energy. The unit of measure is ampere (A)",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.energy.battery",
            "x-to-ocf": [
              "oic.r.energy.electrical.current = electricEnergy"
            ],
            "x-from-ocf": [
              "electricEnergy = oic.r.energy.electrical.current"
            ]
          }
        },
        "voltage": {
          "type": "integer",
          "description": "Rated voltage. The unit of measure is volts (V)",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.energy.battery",
            "x-to-ocf": [
              "oic.r.energy.electrical.voltage = voltage"
            ],
            "x-from-ocf": [
              "voltage = oic.r.energy.electrical.voltage"
            ]
          }
        },
        "material": {
          "type": "string",
          "description": "The material of the cell (for example lithium ion, nickel and lead",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.energy.battery",
            "x-to-ocf": [
              "oic.r.batterymaterial.material = material",
              "Direct translation is difficult as OCF has declared an enumeration of strings where
oneM2M has a free-form string. Translation code will need to determine which oneM2M strings can be
mapped to the OCF enumerated values in oic.r.batterymaterial"
            ],
            "x-from-ocf": [
              "material = oic.r.batterymaterial.material[INDEX]"
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.battery"}
  ],
  "required": [ "level" ]
}
```


9.12 Binary object

9.12.1 Derived model

The derived model: "onem2m.m.binaryobject".

9.12.2 Property definition

Table 23 provides the detailed per Property mapping for "onem2m.m.binaryobject".

Table 23 – The property mapping for "onem2m.m.binaryobject"

oneM2M Property name	OCF Resource	To OCF	From OCF
objectType	oic.r.opaquedata	oic.r.opaquedata.payloadtype = objectType	objectType = oic.r.opaquedata.payloadtype
object	oic.r.opaquedata	oic.r.opaquedata.payload = objectoic.r.opaquedata.encoding = "base64"oic.r.opaquedata.system = "oneM2M"	If the OCF encoding is not base64, then the payload would need to be converted to base64object = oic.r.opaquedata.payload
size	oic.r.opaquedata	oic.r.opaquedata.size = size	size = oic.r.opaquedata.size
hash	oic.r.opaquedata	oic.r.opaquedata.hash = hash	hash = oic.r.opaquedata.hash

Table 24 provides the details of the Properties that are part of "onem2m.m.binaryobject".

Table 24 – The properties of "onem2m.m.binaryobject"

oneM2M Property name	Type	Required	Description
objectType	string	yes	This data point contains the type and subtype of the binary object as a MIME type.
object	string	yes	This data point contains the base64 encoded binary object.
size	integer	no	The size of the decoded binary object.

oneM2M Property name	Type	Required	Description
hash	string	no	The hash code of the blob. If present, it is used to check the decoded content of the "object" data point for integrity. The algorithm used for generating the hash value is SHA-2 [15]. The data point contains the hash as a hex encoded value.

9.12.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.binaryobject.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Binary Object",
  "definitions": {
    "onem2m.m.binaryobject": {
      "type": "object",
      "properties": {
        "object": {
          "type": "string",
          "description": "This data point contains the base64 encoded binary object.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.opaquedata",
            "x-to-ocf": [
              "oic.r.opaquedata.payload = object",
              "oic.r.opaquedata.encoding = \"base64\"",
              "oic.r.opaquedata.system = \"oneM2M\""
            ],
            "x-from-ocf": [
              "If the OCF encoding is not base64, then the payload would need to be converted to
base64",
              "object = oic.r.opaquedata.payload"
            ]
          }
        },
        "objectType": {
          "type": "string",
          "description": "This data point contains the type and subtype of the binary object as a MIME
type.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.opaquedata",
            "x-to-ocf": [
              "oic.r.opaquedata.payloadtype = objectType"
            ],
            "x-from-ocf": [
              "objectType = oic.r.opaquedata.payloadtype"
            ]
          }
        },
        "size": {
          "type": "integer",
          "description": "The size of the decoded binary object.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.opaquedata",
            "x-to-ocf": [
              "oic.r.opaquedata.size = size"
            ],
            "x-from-ocf": [
              "size = oic.r.opaquedata.size"
            ]
          }
```

```
        },
        "hash": {
          "type": "string",
          "description": "The hash code of the blob. If present, it is used to check the decoded
content of the \"object\" data point for integrity. The algorithm used for generating the hash value is
SHA-2 [15]. The data point contains the hash as a hex encoded value.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.opaquedata",
            "x-to-ocf": [
              "oic.r.opaquedata.hash = hash"
            ],
            "x-from-ocf": [
              "hash = oic.r.opaquedata.hash"
           ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.opaquedata"}
  ],
  "required": [ "object", "objectType" ]
}
```

9.13 Binary switch

9.13.1 Derived model

The derived model: "onem2m.m.binaryswitch".

9.13.2 Property definition

Table 25 provides the detailed per Property mapping for "onem2m.m.binaryswitch".

Table 25 – The property mapping for "onem2m.m.binaryswitch"

oneM2M Property name	OCF Resource	To OCF	From OCF
powerState	oic.r.swtich.binary	oic.r.switch.binary.value = powerState	powerState = oic.r.switch.binary.value

Table 26 provides the details of the Properties that are part of "onem2m.m.binaryswitch".

Table 26 – The properties of "onem2m.m.binaryswitch

oneM2M Property name	Type	Required	Description
powerState	boolean	yes	Status of the switch

9.13.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.binaryswitch.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Binary Switch",
```

```
  "definitions": {
    "onem2m.m.binaryswitch": {
      "type": "object",
      "properties": {
        "powerState": {
          "type": "boolean",
          "description": "Status of the switch",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.swtich.binary",
            "x-to-ocf": [
              "oic.r.switch.binary.value = powerState"
            ],
            "x-from-ocf": [
              "powerState = oic.r.switch.binary.value"
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.binaryswitch"}
  ],
  "required": [ "powerState" ]
}
```

9.14 Boiler

9.14.1 Derived model

The derived model: "onem2m.m.boiler".

9.14.2 Property definition

Table 27 provides the detailed per Property mapping for "onem2m.m.boiler".

Table 27 – The property mapping for "onem2m.m.boiler"

oneM2M Property name	OCF Resource	To OCF	From OCF
status	oic.r.sensor	oic.r.sensor.value = status	status = oic.r.sensor.value

Table 28 provides the details of the Properties that are part of "onem2m.m.boiler".

Table 28 – The properties of "onem2m.m.boiler"

oneM2M Property name	Type	Required	Description
status	boolean	yes	The status of boiling.

9.14.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.boiler.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
```

```
  "title": "Boiler",
  "definitions": {
    "onem2m.m.boiler": {
      "type": "object",
      "properties": {
        "status": {
          "type": "boolean",
          "description": "The status of boiling.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.sensor",
            "x-to-ocf": [
              "oic.r.sensor.value = status"
            ],
            "x-from-ocf": [
              "status = oic.r.sensor.value"
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.boiler"}
  ],
  "required": [ "status" ]
}
```

9.15 Brewing

9.15.1 Derived model

The derived model: "onem2m.m.brewing".

9.15.2 Property definition

Table 29 provides the detailed per Property mapping for "onem2m.m.brewing".

Table 29 – The property mapping for "onem2m.m.brewing"

oneM2M Property name	OCF Resource	To OCF	From OCF
cupsNumber	oic.r.brewing	oic.r.brewing.amountrequested = cupsNumber * 150	cupsNumber = floor(oic.r.brewing.amountrequested / 150)
strength	oic.r.brewing	oic.r.brewing.strengthrange[0] = 1oic.r.brewing.strengthrange[1] = 5oic.r.brewing.strength = strength	oic.r.brewing.strengthrange[0] = 1oic.r.brewing.strengthrange[1] = 5strength = oic.r.brewing.strength

Table 30 provides the details of the Properties that are part of "onem2m.m.brewing".

Table 30 – The properties of "onem2m.m.brewing"

oneM2M Property name	Type	Required	Description
cupsNumber	integer	yes	The current number of the cups requested to brew
strength	integer	no	The current strength of the drink taste. A higher value indicates a stronger taste

9.15.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.brewing.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Brewing",
  "definitions": {
    "onem2m.m.brewing": {
      "type": "object",
      "properties": {
        "cupsNumber": {
          "type": "integer",
          "description": "The current number of the cups requested to brew",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.brewing",
            "x-to-ocf": [
              "oic.r.brewing.amountrequested = cupsNumber * 150"
            ],
            "x-from-ocf": [
              "cupsNumber = floor(oic.r.brewing.amountrequested / 150)"
            ]
          }
        },
        "strength": {
          "type": "integer",
          "description": "The current strength of the drink taste. A higher value indicates a stronger
taste",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.brewing",
            "x-to-ocf": [
              "oic.r.brewing.strengthrange[0] = 1",
              "oic.r.brewing.strengthrange[1] = 5",
              "oic.r.brewing.strength = strength"
            ],
            "x-from-ocf": [
              "oic.r.brewing.strengthrange[0] = 1",
              "oic.r.brewing.strengthrange[1] = 5",
              "strength = oic.r.brewing.strength"
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.brewing"}
  ],
  "required": [ "cupsNumber"]
}
```

9.16 Brightness

9.16.1 Derived model

The derived model: "onem2m.m.brightness".

9.16.2 Property definition

Table 31 provides the detailed per Property mapping for "onem2m.m.brightness".

Table 31 – The property mapping for "onem2m.m.brightness"

oneM2M Property name	OCF Resource	To OCF	From OCF
brightness	oic.r.light.brightness	oic.r.light.brightness.brightness = brightness	brightness = oic.r.light.brightness.brightness

Table 32 provides the details of the Properties that are part of "onem2m.m.brightness".

Table 32 – The properties of "onem2m.m.brightness"

oneM2M Property name	Type	Required	Description
brightness	integer	yes	The status of brightness level in percentage

9.16.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.brightness.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description": "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Brightness",
  "definitions": {
    "onem2m.m.brightness": {
      "type": "object",
      "properties": {
        "brightness": {
          "type": "integer",
          "description": "The status of brightness level in percentage",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.light.brightness",
            "x-to-ocf": [
              "oic.r.light.brightness.brightness = brightness"
            ],
            "x-from-ocf": [
              "brightness = oic.r.light.brightness.brightness"
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
```

```
    {"$ref": "#/definitions/onem2m.m.brightness"}
  ],
  "required": [ "brightness" ]
}
```

9.17 Clock

9.17.1 Derived model

The derived model: "onem2m.m.clock".

9.17.2 Property definition

Table 33 provides the detailed per Property mapping for "onem2m.m.clock".

Table 33 – The property mapping for "onem2m.m.clock"

oneM2M Property name	OCF Resource	To OCF	From OCF
currentTime	oic.r.clock	bytecpy (oic.r.clock.datetime + "timepos", currentTime, "timelen");	bytecpy (currentTime, oic.r.clock.datetime + "timepos", "timelen");
currentDate	oic.r.clock	bytecpy (oic.r.clock.datetime + "datepos", currentDate, "datelen");	bytecpy (currentDate, oic.r.clock.datetime + "datepos", "datelen");
currentTimeZone	oic.r.clock	Convert IANA formatted currentTimeZone to oic.r.clock.datetime timezone offset location using library calltx_convert (oic.r.clock.datetime + "tzpos", currentTimeZone);	Convert oic.r.clock.datetime timezone offset location in IANA formatted currentTimeZone using library calltz_convert (currentTimeZone, oic.r.clock.datetime + "tzpos");

Table 34 provides the details of the Properties that are part of "onem2m.m.clock".

Table 34 – The properties of "onem2m.m.clock"

oneM2M Property name	Type	Required	Description
currentTime	string	yes	Information of the current time.
currentDate	string	yes	Information of the current time.
currentTimeZone	string	no	Name of current time zone according to the IANA Timezone data format (TZ) (https://www.iana.org/time-zones).

9.17.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.clock.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Clock",
  "definitions": {
    "onem2m.m.clock": {
      "type": "object",
      "properties": {
        "currentTime": {
          "type": "string",
          "description": "Information of the current time.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.clock",
            "x-to-ocf": [
              "bytecpy ( oic.r.clock.datetime + \"timepos\", currentTime, \"timelen\" );"
            ],
            "x-from-ocf": [
              "bytecpy ( currentTime, oic.r.clock.datetime + \"timepos\", \"timelen\" );"
            ]
          }
        },
        "currentDate": {
          "type": "string",
          "description": "Information of the current time.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.clock",
            "x-to-ocf": [
              "bytecpy ( oic.r.clock.datetime + \"datepos\", currentDate, \"datelen\" );"
            ],
            "x-from-ocf": [
              "bytecpy ( currentDate, oic.r.clock.datetime + \"datepos\", \"datelen\" );"
            ]
          }
        },
        "currentTimeZone": {
          "type": "string",
          "description": "Name of current time zone according to the IANA Timezone data format (TZ)
(https://www.iana.org/time-zones).",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.clock",
            "x-to-ocf": [
              "Convert IANA formatted currentTimeZone to oic.r.clock.datetime timezone offset location
using library call",
              "tx_convert ( oic.r.clock.datetime + \"tzpos\", currentTimeZone );"
            ],
            "x-from-ocf": [
```

```
              "Convert oic.r.clock.datetime timezone offset location in IANA formatted currentTimeZone
using library call",
              "tz_convert ( currentTimeZone, oic.r.clock.datetime + \"tzpos\" );"
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.clock"}
  ],
  "required": [ "currentTime", "currentDate" ]
}
```

9.18 Clothes dryer job mode

9.18.1 Derived model

The derived model: "onem2m.m.clothesdryerjobmode".

9.18.2 Property definition

Table 35 provides the detailed per Property mapping for "onem2m.m.clothesdryerjobmode".

Table 35 – The property mapping for "onem2m.m.clothesdryerjobmode"

oneM2M Property name	OCF Resource	To OCF	From OCF
currentJobModeName	oic.r.operational.state	This value does not exist in OCF as it is already accommodated in the currentJobMode property.	Need to translate between the OCF operational state enumerated string and the oneM2M string valueif (oic.r.operational.state.currentJobState == "normal") { currentJobModeName = "normal"; }if (oic.r.operational.state.currentJobState == "quick") { currentJobModeName = "quickDry"; }if (oic.r.operational.state.currentJobState == "permapress" { currentJobModeName = "permanentPress"; }if (oic.r.operational.state.currentJobState == "heavy") { currentJobModeName = "heavyDuty"; }if (oic.r.operational.state.currentJobState == "delicate") { currentJobModeName = "delicates"; }if (oic.r.operational.state.currentJobState == "airDry") { currentJobModeName = "airDry"; }if (oic.r.operational.state.currentJobState == "extended") { currentJobModeName = "extendedTumble"; }else { currentJobModeName = ""; }
jobModes	oic.r.operational.state	This does not exist in OCF as all possible operational states are available.	This is an array of integers in oneM2M defined by the current version of the specification as follows:jobModes[1] = 1jobModes[2] = 2jobModes[3] = 3jobModes[4] = 4jobModes[5] = 5jobModes[6] = 6jobModes[7] = 7

oneM2M Property name	OCF Resource	To OCF	From OCF
currentJobMode	oic.r.operational.state	Need to translate between the oneM2M integer value and the OCF operational state enumerated stringif (currentJobMode == 1) { oic.r.operational.state.currentJobState == "normal"; }if (currentJobMode == 2) { oic.r.operational.state.currentJobState == "quick"; }if (currentJobMode == 3) { oic.r.operational.state.currentJobState == "permapress"; }if (currentJobMode == 4) { oic.r.operational.state.currentJobState == "heavy"; }if (currentJobMode == 5) { oic.r.operational.state.currentJobState == "delicate"; }if (currentJobMode == 6) { oic.r.operational.state.currentJobState == "airDry"; }if (currentJobMode == 7) { oic.r.operational.state.currentJobState == "extended"; }else { oic.r.operational.state.currentJobState == "unknown"; }	Need to translate between the OCF operational state enumerated string and the oneM2M integer valueif (oic.r.operational.state.currentJobState == "normal") { currentJobMode = 1; }if (oic.r.operational.state.currentJobState == "quick") { currentJobMode = 2; }if (oic.r.operational.state.currentJobState == "permapress" { currentJobMode = 3; }if (oic.r.operational.state.currentJobState == "heavy") { currentJobMode = 4; }if (oic.r.operational.state.currentJobState == "delicate") { currentJobMode = 5; }if (oic.r.operational.state.currentJobState == "airDry") { currentJobMode = 6; }if (oic.r.operational.state.currentJobState == "extended") { currentJobMode = 7; }else { currentJobMode = 0; }

Table 36 provides the details of the Properties that are part of "onem2m.m.clothesdryerjobmode".

Table 36 – The properties of "onem2m.m.clothesdryerjobmode"

oneM2M Property name	Type	Required	Description
currentJobModeName	string	no	Name of current job mode in string. This can be used when currentJobMode is vendor-specific.
jobModes	array	yes	List of possible job states the device supports
currentJobMode	integer	yes	Currently active job mode.

9.18.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.clothesdryerjobmode.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Clothes Dryer Job Mode",
  "definitions": {
    "onem2m.m.clothesdryerjobmode": {
      "type": "object",
      "properties": {
        "currentJobMode": {
          "type": "integer",
          "description": "Currently active job mode.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.operational.state",
            "x-to-ocf": [
              "Need to translate between the oneM2M integer value and the OCF operational state
enumerated string",
              "if ( currentJobMode == 1 ) { oic.r.operational.state.currentJobState == \"normal\"; }",
              "if ( currentJobMode == 2 ) { oic.r.operational.state.currentJobState == \"quick\"; }",
              "if ( currentJobMode == 3 ) { oic.r.operational.state.currentJobState ==
\"permapress\"; }",
              "if ( currentJobMode == 4 ) { oic.r.operational.state.currentJobState == \"heavy\"; }",
              "if ( currentJobMode == 5 ) { oic.r.operational.state.currentJobState ==
\"delicate\"; }",
              "if ( currentJobMode == 6 ) { oic.r.operational.state.currentJobState == \"airDry\"; }",
              "if ( currentJobMode == 7 ) { oic.r.operational.state.currentJobState ==
\"extended\"; }",
              "else { oic.r.operational.state.currentJobState == \"unknown\"; }"
            ],
            "x-from-ocf": [
              "Need to translate between the OCF operational state enumerated string and the oneM2M
integer value",
              "if (oic.r.operational.state.currentJobState == \"normal\" ) { currentJobMode = 1; }",
              "if (oic.r.operational.state.currentJobState == \"quick\" ) { currentJobMode = 2; }",
              "if (oic.r.operational.state.currentJobState == \"permapress\" { currentJobMode = 3; }",
              "if (oic.r.operational.state.currentJobState == \"heavy\" ) { currentJobMode = 4; }",
              "if (oic.r.operational.state.currentJobState == \"delicate\" ) { currentJobMode = 5; }",
              "if (oic.r.operational.state.currentJobState == \"airDry\" ) { currentJobMode = 6; }",
              "if (oic.r.operational.state.currentJobState == \"extended\" ) { currentJobMode = 7; }",
              "else { currentJobMode = 0; }"
            ]
          }
        },
        "currentJobModeName": {
          "type": "string",
          "description": "Name of current job mode in string. This can be used when currentJobMode is
vendor-specific.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.operational.state",
            "x-to-ocf": [
              "This value does not exist in OCF as it is already accommodated in the currentJobMode
property."
            ],
            "x-from-ocf": [
              "Need to translate between the OCF operational state enumerated string and the oneM2M
string value",
              "if (oic.r.operational.state.currentJobState == \"normal\" ) { currentJobModeName =
\"normal\"; }",
              "if (oic.r.operational.state.currentJobState == \"quick\" ) { currentJobModeName =
\"quickDry\"; }",
              "if (oic.r.operational.state.currentJobState == \"permapress\" { currentJobModeName =
\"permanentPress\"; }",
              "if (oic.r.operational.state.currentJobState == \"heavy\" ) { currentJobModeName =
\"heavyDuty\"; }",
              "if (oic.r.operational.state.currentJobState == \"delicate\" ) { currentJobModeName =
\"delicates\"; }",
              "if (oic.r.operational.state.currentJobState == \"airDry\" ) { currentJobModeName =
\"airDry\"; }",
              "if (oic.r.operational.state.currentJobState == \"extended\" ) { currentJobModeName =
\"extendedTumble\"; }",
              "else { currentJobModeName = \"\"; }"
            ]
          }
        },
        "jobModes": {
```

```
          "type": "array",
          "description": "List of possible job states the device supports",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.operational.state",
            "x-to-ocf": [
              "This does not exist in OCF as all possible operational states are available."
            ],
            "x-from-ocf": [
              "This is an array of integers in oneM2M defined by the current version of the
specification as follows:",
              "jobModes[1] = 1",
              "jobModes[2] = 2",
              "jobModes[3] = 3",
              "jobModes[4] = 4",
              "jobModes[5] = 5",
              "jobModes[6] = 6",
              "jobModes[7] = 7"
           ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.airconjobmode"}
  ],
  "required": [ "currentJobMode", "jobModes" ]
}
```

9.19 Colour

9.19.1 Derived model

The derived model: "onem2m.m.colour".

9.19.2 Property definition

Table 37 provides the detailed per Property mapping for "onem2m.m.colour".

Table 37 – The property mapping for "onem2m.m.colour"

oneM2M Property name	OCF Resource	To OCF	From OCF
red	oic.r.colour	oic.r.colour.rgb.rgbValue[0] = red	red = oic.r.colour.rgb.rgbValue[0]
blue	oic.r.colour	oic.r.colour.rgb.rgbValue[2] = blue	blue = oic.r.colour.rgb.rgbValue[2]
green	oic.r.colour	oic.r.colour.rgb.rgbValue[1] = green	green = oic.r.colour.rgb.rgbValue[1]

Table 38 provides the details of the Properties that are part of "onem2m.m.colour".

Table 38 – The properties of "onem2m.m.colour"

oneM2M Property name	Type	Required	Description
red	integer	yes	The value of the Red colour channel of RGB. The range is [0,255]
blue	integer	yes	The value of the Blue colour channel of RGB. The range is [0,255]
green	integer	yes	The value of the Green colour channel of RGB. The range is [0,255]

9.19.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.colour.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Colour",
  "definitions": {
    "onem2m.m.colour": {
      "type": "object",
      "properties": {
        "red": {
          "type": "integer",
          "description": "The value of the Red colour channel of RGB. The range is [0,255]",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.colour",
            "x-to-ocf": [
              "oic.r.colour.rgb.rgbValue[0] = red"
            ],
            "x-from-ocf": [
              "red = oic.r.colour.rgb.rgbValue[0]"
            ]
          }
        },
        "green": {
          "type": "integer",
          "description": "The value of the Green colour channel of RGB. The range is [0,255]",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.colour",
            "x-to-ocf": [
              "oic.r.colour.rgb.rgbValue[1] = green"
            ],
            "x-from-ocf": [
              "green = oic.r.colour.rgb.rgbValue[1]"
            ]
          }
        },
        "blue": {
          "type": "integer",
          "description": "The value of the Blue colour channel of RGB. The range is [0,255]",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.colour",
            "x-to-ocf": [
              "oic.r.colour.rgb.rgbValue[2] = blue"
            ],
            "x-from-ocf": [
              "blue = oic.r.colour.rgb.rgbValue[2]"
            ]
```

```
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.colour.json"}
  ],
  "required": [ "red", "green", "blue"]
}
```

9.20 Colour saturation

9.20.1 Derived model

The derived model: "onem2m.m.coloursaturation".

9.20.2 Property definition

Table 39 provides the detailed per Property mapping for "onem2m.m.coloursaturation".

Table 39 – The property mapping for "onem2m.m.coloursaturation"

oneM2M Property name	OCF Resource	To OCF	From OCF
colourSaturation	oic.r.colour.saturation	oic.r.colour.saturation.colourSaturation = colourSaturation	colourSaturation = oic.r.colour.saturation.colourSaturation

Table 40 provides the details of the Properties that are part of "onem2m.m.coloursaturation".

Table 40 – The properties of "onem2m.m.coloursaturation"

oneM2M Property name	Type	Required	Description
colourSaturation	integer	yes	The status of colour saturation level. 'colourSaturation' has a range of [0,100].

9.20.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.coloursaturation.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Colour Saturation",
  "definitions": {
    "onem2m.m.coloursaturation": {
      "type": "object",
      "properties": {
        "colourSaturation": {
          "type": "integer",
          "description": "The status of colour saturation level. 'colourSaturation' has a range of
[0,100].",
```

```
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.colour.saturation",
            "x-to-ocf": [
              "oic.r.colour.saturation.colourSaturation = colourSaturation"
            ],
            "x-from-ocf": [
              "colourSaturation = oic.r.colour.saturation.colourSaturation"
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.coloursaturation"}
  ],
  "required": [ "colourSaturation" ]
}
```

9.21 Credentials

9.21.1 Derived model

The derived model: "onem2m.m.credentials".

9.21.2 Property definition

Table 41 provides the detailed per Property mapping for "onem2m.m.credentials".

Table 41 – The property mapping for "onem2m.m.credentials"

oneM2M Property name	OCF Resource	To OCF	From OCF
loginName	oic.r.userinfo	oic.r.userinfo.username = loginName	loginName = oic.r.userinfo.username
token	oic.r.userinfo	oic.r.userinfo.token = token	token = oic.r.userinfo.token
password	oic.r.userinfo	oic.r.userinfo.password = password	password = oic.r.userinfo.password

Table 42 provides the details of the Properties that are part of "onem2m.m.credentials".

Table 42 – The properties of "onem2m.m.credentials"

oneM2M Property name	Type	Required	Description
loginName	string	no	User's login name.
token	string	no	Authentication token e.g. OAuth token.
password	string	no	User's password.

9.21.3 Derived model definition


```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.credentials.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Credentials",
  "definitions": {
    "onem2m.m.credentials": {
      "type": "object",
      "properties": {
        "loginName": {
          "type": "string",
          "description": "User's login name.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.userinfo",
            "x-to-ocf": [
              "oic.r.userinfo.username = loginName"
            ],
            "x-from-ocf": [
              "loginName = oic.r.userinfo.username"
            ]
          }
        },
        "password": {
          "type": "string",
          "description": "User's password.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.userinfo",
            "x-to-ocf": [
              "oic.r.userinfo.password = password"
            ],
            "x-from-ocf": [
              "password = oic.r.userinfo.password"
            ]
          }
        },
        "token": {
          "type": "string",
          "description": "Authentication token e.g. OAuth token.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.userinfo",
            "x-to-ocf": [
              "oic.r.userinfo.token = token"
            ],
            "x-from-ocf": [
              "token = oic.r.userinfo.token"
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.credentials"}
  ],
  "required": [ ]
}
```


9.22 Dehumidifer job mode

9.22.1 Derived model

The derived model: "onem2m.m.dehumidiiferjobmode".

9.22.2 Property definition

Table 43 provides the detailed per Property mapping for "onem2m.m.dehumidiiferjobmode".

Table 43 – The property mapping for "onem2m.m.dehumidiiferjobmode"

oneM2M Property name	OCF Resource	To OCF	From OCF
currentJobMode	oic.r.operational.state	Need to translate between the oneM2M integer value and the OCF operational state enumerated stringif (currentJobMode == 1) { oic.r.operational.state.currentJobState == "smart"; }if (currentJobMode == 2) { oic.r.operational.state.currentJobState == "fast"; }if (currentJobMode == 3) { oic.r.operational.state.currentJobState == "silent"; }if (currentJobMode == 4) { oic.r.operational.state.currentJobState == "focused"; }if (currentJobMode == 5) { oic.r.operational.state.currentJobState == "clothes"; }else { oic.r.operational.state.currentJobState == "unknown"; }	Need to translate between the OCF operational state enumerated string and the oneM2M integer valueif (oic.r.operational.state.currentJobState == "smart") { currentJobMode = 1; }if (oic.r.operational.state.currentJobState == "fast") { currentJobMode = 2; }if (oic.r.operational.state.currentJobState == "silent" { currentJobMode = 3; }if (oic.r.operational.state.currentJobState == "focused") { currentJobMode = 4; }if (oic.r.operational.state.currentJobState == "clothes") { currentJobMode = 5; }else { currentJobMode = 0; }
currentJobMode Name	oic.r.operational.state	This value does not exist in OCF as it is already accommodated in the currentJobMode property.	Need to translate between the OCF operational state enumerated string and the oneM2M string valueif (oic.r.operational.state.currentJobState == "smart") { currentJobModeName = "smart"; }if (oic.r.operational.state.currentJobState == "fast") { currentJobModeName = "fast"; }if (oic.r.operational.state.currentJobState == "silent" { currentJobModeName = "silent"; }if (oic.r.operational.state.currentJobState == "focused") { currentJobModeName = "focus"; }if (oic.r.operational.state.currentJobState == "clothes") { currentJobModeName = "clothes"; }else { currentJobModeName = ""; }

oneM2M Property name	OCF Resource	To OCF	From OCF
jobModes	oic.r.operational.state	This does not exist in OCF as all possible operational states are available.	This is an array of integers in oneM2M defined by the current version of the specification as follows:jobModes[1] = 1jobModes[2] = 2jobModes[3] = 3jobModes[4] = 4jobModes[5] = 5

Table 44 provides the details of the Properties that are part of "onem2m.m.dehumidiiferjobmode".

Table 44 – The properties of "onem2m.m.dehumidiiferjobmode"

oneM2M Property name	Type	Required	Description
currentJobMode	integer	yes	Currently active job mode.
currentJobModeName	string	no	Name of current job mode in string. This can be used when currentJobMode is vendor-specific.
jobModes	array	yes	List of possible job states the device supports

9.22.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.dehumidiiferjobmode.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Dehumidifier Job Mode",
  "definitions": {
    "onem2m.m.dehumidiiferjobmode": {
      "type": "object",
      "properties": {
        "currentJobMode": {
          "type": "integer",
          "description": "Currently active job mode.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.operational.state",
            "x-to-ocf": [
              "Need to translate between the oneM2M integer value and the OCF operational state
enumerated string",
              "if ( currentJobMode == 1 ) { oic.r.operational.state.currentJobState == \"smart\"; }",
              "if ( currentJobMode == 2 ) { oic.r.operational.state.currentJobState == \"fast\"; }",
              "if ( currentJobMode == 3 ) { oic.r.operational.state.currentJobState == \"silent\"; }",
              "if ( currentJobMode == 4 ) { oic.r.operational.state.currentJobState == \"focused\"; }",
              "if ( currentJobMode == 5 ) { oic.r.operational.state.currentJobState == \"clothes\"; }",
              "else { oic.r.operational.state.currentJobState == \"unknown\"; }"
            ],
            "x-from-ocf": [
              "Need to translate between the OCF operational state enumerated string and the oneM2M
integer value",
```

```
              "if (oic.r.operational.state.currentJobState == \"smart\" ) { currentJobMode = 1; }",
              "if (oic.r.operational.state.currentJobState == \"fast\" ) { currentJobMode = 2; }",
              "if (oic.r.operational.state.currentJobState == \"silent\" ) { currentJobMode = 3; }",
              "if (oic.r.operational.state.currentJobState == \"focused\" ) { currentJobMode = 4; }",
              "if (oic.r.operational.state.currentJobState == \"clothes\" ) { currentJobMode = 5; }",
              "else { currentJobMode = 0; }"
            ]
          }
        },
        "currentJobModeName": {
          "type": "string",
          "description": "Name of current job mode in string. This can be used when currentJobMode is
vendor-specific.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.operational.state",
            "x-to-ocf": [
              "This value does not exist in OCF as it is already accommodated in the currentJobMode
property."
            ],
            "x-from-ocf": [
              "Need to translate between the OCF operational state enumerated string and the oneM2M
string value",
              "if (oic.r.operational.state.currentJobState == \"smart\" ) { currentJobModeName =
\"smart\"; }",
              "if (oic.r.operational.state.currentJobState == \"fast\" ) { currentJobModeName =
\"fast\"; }",
              "if (oic.r.operational.state.currentJobState == \"silent\" ) { currentJobModeName =
\"silent\"; }",
              "if (oic.r.operational.state.currentJobState == \"focused\" ) { currentJobModeName =
\"focus\"; }",
              "if (oic.r.operational.state.currentJobState == \"clothes\" ) { currentJobModeName =
\"clothes\"; }",
              "else { currentJobModeName = \"\"; }"
            ]
          }
        },
        "jobModes": {
          "type": "array",
          "description": "List of possible job states the device supports",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.operational.state",
            "x-to-ocf": [
              "This does not exist in OCF as all possible operational states are available."
            ],
            "x-from-ocf": [
              "This is an array of integers in oneM2M defined by the current version of the
specification as follows:",
              "jobModes[1] = 1",
              "jobModes[2] = 2",
              "jobModes[3] = 3",
              "jobModes[4] = 4",
              "jobModes[5] = 5"
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.airconjobmode"}
  ],
  "required": [ "currentJobMode", "jobModes" ]
}
```

9.23 Door status

9.23.1 Derived model

The derived model: "onem2m.m.doorStatus".

9.23.2 Property definition

Table 45 provides the detailed per Property mapping for "onem2m.m.doorStatus".

Table 45 – The property mapping for "onem2m.m.doorStatus"

oneM2M Property name	OCF Resource	To OCF	From OCF
openDuration	oic.r.door	Conversion from oneM2M timestamp is not yet definedoic.r.door.openDuration = openDuration	Conversion from oneM2M timestamp is not yet definedopenDuration = oic.r.door.openDuration
doorState	oic.r.door	if doorState == 1oic.r.door.openState = "Closed"if doorState == 2oic.r.door.openState = "Open"	if oic.r.door.openState = "Closed"doorState == 1if oic.r.door.openState = "Open"doorState == 2
openAlarm	oic.r.door	oic.r.door.openAlarm = openAlarm	openAlarm = oic.r.door.openAlarm

Table 46 provides the details of the Properties that are part of "onem2m.m.doorStatus".

Table 46 – The properties of "onem2m.m.doorStatus".

oneM2M Property name	Type	Required	Description
openDuration	string	no	The time duration the door has been open.
doorState	integer	yes	Current state of the door.
openAlarm	boolean	no	The state of the door open alarm. 'True' indicates that the open alarm is active. 'False' indicates that the open alarm is not active.

9.23.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.doorStatus.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Door Status",
  "definitions": {
    "onem2m.m.doorStatus": {
      "type": "object",
      "properties": {
        "doorState": {
          "type": "integer",
          "description": "Current state of the door.",
```

```
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.door",
            "x-to-ocf": [
              "if doorState == 1",
                 "oic.r.door.openState = \"Closed\"",
              "if doorState == 2",
                 "oic.r.door.openState = \"Open\""
            ],
            "x-from-ocf": [
              "if oic.r.door.openState = \"Closed\"",
                 "doorState == 1",
              "if oic.r.door.openState = \"Open\"",
                 "doorState == 2"
            ]
          }
        },
        "openDuration": {
          "type": "string",
          "description": "The time duration the door has been open.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.door",
            "x-to-ocf": [
              "Conversion from oneM2M timestamp is not yet defined",
              "oic.r.door.openDuration = openDuration"
            ],
            "x-from-ocf": [
              "Conversion from oneM2M timestamp is not yet defined",
              "openDuration = oic.r.door.openDuration"
            ]
          }
        },
        "openAlarm": {
          "type": "boolean",
          "description": "The state of the door open alarm. 'True' indicates that the open alarm is
active. 'False' indicates that the open alarm is not active.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.door",
            "x-to-ocf": [
              "oic.r.door.openAlarm = openAlarm"
            ],
            "x-from-ocf": [
              "openAlarm = oic.r.door.openAlarm"
            ]
          }
        }
      }
    },
    "type": "object",
    "allOf": [
      {"$ref": "#/definitions/onem2m.m.doorStatus"}
    ],
    "required": [ "doorState" ]
}
```

9.24 Electric vehicle connector

9.24.1 Derived model

The derived model: "onem2m.m.electricvehicleconnector".

9.24.2 Property definition

Table 47 provides the detailed per Property mapping for "onem2m.m.electricvehicleconnector".

Table 47 – The property mapping for "onem2m.m.electricvehicleconnector"

oneM2M Property name	OCF Resource	To OCF	From OCF
propDischargingCapacity	oic.r.vehicle.connector	oic.r.vehicle.connector.rateddischargingcapacity = propDischargingCapacity * 1000	propDischargingCapacity = oic.r.vehicle.connector.rateddischargingcapacity / 1000
propChargingCapacity	oic.r.vehicle.connector	oic.r.vehicle.connector.ratedchargingcapacity = propChargingCapacity * 1000	propChargingCapacity = oic.r.vehicle.connector.ratedchargingcapacity / 1000
status	oic.r.vehicle.connector	oic.r.vehicle.connector.status = status;	status = oic.r.vehicle.connector.status

Table 48 provides the details of the Properties that are part of "onem2m.m.electricvehicleconnector".

Table 48 – The properties of "onem2m.m.electricvehicleconnector"

oneM2M Property name	Type	Required	Description
propDischargingCapacity	integer	no	Rated discharging capacity in milli-Amps.
propChargingCapacity	integer	no	Rated charging capacity in milli-Amps.
status	boolean	yes	The status of connection.

9.24.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.electricvehicleconnector#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Electric Vehicle Connector",
  "definitions": {
    "onem2m.m.electricvehicleconnector": {
      "type": "object",
      "properties": {
        "status": {
          "type": "boolean",
          "description": "The status of connection.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.vehicle.connector",
            "x-to-ocf": [
              "oic.r.vehicle.connector.status = status;"
            ],
            "x-from-ocf": [
              "status = oic.r.vehicle.connector.status"
            ]
          }
        },
        "propChargingCapacity": {
          "type": "integer",
          "description": "Rated charging capacity in milli-Amps.",
```

```
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.vehicle.connector",
            "x-to-ocf": [
              "oic.r.vehicle.connector.ratedchargingcapacity = propChargingCapacity * 1000"
            ],
            "x-from-ocf": [
              "propChargingCapacity = oic.r.vehicle.connector.ratedchargingcapacity / 1000"
            ]
          }
        },
        "propDischargingCapacity": {
          "type": "integer",
          "description": "Rated discharging capacity in milli-Amps.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.vehicle.connector",
            "x-to-ocf": [
              "oic.r.vehicle.connector.rateddischargingcapacity = propDischargingCapacity * 1000"
            ],
            "x-from-ocf": [
              "propDischargingCapacity = oic.r.vehicle.connector.rateddischargingcapacity / 1000"
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.electricvehicleconnector"}
  ],
  "required": [ "status" ]
}
```


9.25 Energy consumption

9.25.1 Derived model

The derived model: "onem2m.m.energyconsumption".

9.25.2 Property definition

Table 49 provides the detailed per Property mapping for "onem2m.m.energyconsumption".

Table 49 – The property mapping for "onem2m.m.energyconsumption"

oneM2M Property name	OCF Resource	To OCF	From OCF
significantDigits	oic.r.energy.consumption	This is not needed in OCF as only the absolute energy consumption is tracked.	significantDigits = 0
roundingEnergyConsumption	oic.r.energy.consumption	This is not needed in OCF as only the absolute energy consumption is tracked.	roundingEnergyConsumption = oic.r.energy.consumption.energy
voltage	oic.r.energy.electrical	oic.r.energy.electrical.voltage = voltage	voltage = oic.r.energy.electrical.voltage

oneM2M Property name	OCF Resource	To OCF	From OCF
frequency	oic.r.energy.electrical	oic.r.energy.electrical.frequency = frequency	frequency = oic.r.energy.electrical.frequency
multiplyingFactors	oic.r.energy.consumption	This is not needed in OCF as only the absolute energy consumption is tracked.	multiplyingFactors = 1
absoluteEnergyConsumption	oic.r.energy.consumption	oic.r.energy.consumption.energy = absoluteEnergyConsumption	absoluteEnergyConsumption = oic.r.energy.consumption.energy
current	oic.r.energy.electrical	oic.r.energy.electrical.current = current	current = oic.r.energy.electrical.current
Power	oic.r.energy.consumption	oic.r.energy.consumption.power = Power;	Power = oic.r.energy.consumption.power

Table 50 provides the details of the Properties that are part of "onem2m.m.energyconsumption".

Table 50 – The properties of "onem2m.m.energyconsumption"

oneM2M Property name	Type	Required	Description
significantDigits	integer	no	The number of effective digits for data.
roundingEnergyConsumption	number	no	This energy consumption data can be calculated by using significantDigits and multiplyingFactors.
voltage	number	no	The voltage of the device. The common unit is volts (V).
frequency	number	no	The frequency of the device. The common unit is hertz (H).
multiplyingFactors	integer	no	The unit for data (multiplying factors)., e.g. 1 kWh, 0,1 kWh, 0,01 kWh etc.

oneM2M Property name	Type	Required	Description
absoluteEnergyConsumption	number	no	The absolute energy consumption, reflecting the real measurement of accumulative energy. The common unit is Watt-hour (Wh).
current	number	no	The current of the device. The common unit is ampere (A).
Power	number	yes	The power of the device. The common unit is Watt (W).

9.25.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.energyconsumption#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Energy Consumption",
  "definitions": {
    "onem2m.m.energyconsumption": {
      "type": "object",
      "properties": {
        "Power": {
          "type": "number",
          "description": "The power of the device. The common unit is Watt (W).",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.energy.consumption",
            "x-to-ocf": [
              "oic.r.energy.consumption.power = Power;"
            ],
            "x-from-ocf": [
              "Power = oic.r.energy.consumption.power"
            ]
          }
        },
        "absoluteEnergyConsumption": {
          "type": "number",
          "description": "The absolute energy consumption, reflecting the real measurement of
accumulative energy. The common unit is Watt-hour (Wh).",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.energy.consumption",
            "x-to-ocf": [
              "oic.r.energy.consumption.energy = absoluteEnergyConsumption"
            ],
            "x-from-ocf": [
              "absoluteEnergyConsumption = oic.r.energy.consumption.energy"
            ]
          }
        },
        "roundingEnergyConsumption": {
          "type": "number",
          "description": "This energy consumption data can be calculated by using significantDigits and
multiplyingFactors.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.energy.consumption",
            "x-to-ocf": [
              "This is not needed in OCF as only the absolute energy consumption is tracked."
            ],
```

```
            "x-from-ocf": [
              "roundingEnergyConsumption = oic.r.energy.consumption.energy"
            ]
          }
        },
        "significantDigits": {
          "type": "integer",
          "description": "The number of effective digits for data.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.energy.consumption",
            "x-to-ocf": [
              "This is not needed in OCF as only the absolute energy consumption is tracked."
            ],
            "x-from-ocf": [
              "significantDigits = 0"
            ]
          }
        },
        "multiplyingFactors": {
          "type": "integer",
          "description": "The unit for data (multiplying factors)., e.g. 1 kWh, 0,1 kWh, 0,01 kWh
etc.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.energy.consumption",
            "x-to-ocf": [
              "This is not needed in OCF as only the absolute energy consumption is tracked."
            ],
            "x-from-ocf": [
              "multiplyingFactors = 1"
            ]
          }
        },
        "voltage": {
          "type": "number",
          "description": "The voltage of the device. The common unit is volts (V).",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.energy.electrical",
            "x-to-ocf": [
              "oic.r.energy.electrical.voltage = voltage"
            ],
            "x-from-ocf": [
              "voltage = oic.r.energy.electrical.voltage"
            ]
          }
        },
        "current": {
          "type": "number",
          "description": "The current of the device. The common unit is ampere (A).",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.energy.electrical",
            "x-to-ocf": [
              "oic.r.energy.electrical.current = current"
            ],
            "x-from-ocf": [
              "current = oic.r.energy.electrical.current"
            ]
          }
        },
        "frequency": {
          "type": "number",
          "description": "The frequency of the device. The common unit is hertz (H).",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.energy.electrical",
            "x-to-ocf": [
              "oic.r.energy.electrical.frequency = frequency"
            ],
            "x-from-ocf": [
              "frequency = oic.r.energy.electrical.frequency"
            ]
          }
        }
      }
    }
  },
```

```
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.energyconsumption"}
  ],
  "required": [ "Power" ]
}
```

9.26 Energy generation

9.26.1 Derived model

The derived model: "onem2m.m.energygeneration".

9.26.2 Property definition

Table 51 provides the detailed per Property mapping for "onem2m.m.energygeneration".

Table 51 – The property mapping for "onem2m.m.energygeneration"

oneM2M Property name	OCF Resource	To OCF	From OCF
multiplyingFactors	oic.r.energy.generation	This is not needed in OCF as only the absolute energy consumption is tracked.	multiplyingFactors = 1
roundingEnergyGeneration	oic.r.energy.generation	This is not needed in OCF as only the absolute energy consumption is tracked.	roundingEnergyConsumption = oic.r.energy.consumption.powerGenerationData
powerGenerationData	oic.r.energy.generation	oic.r.energy.generation.energygenerated = powerGenerationData;	powerGenerationData = oic.r.energy.generation.energygenerated
significantDigits	oic.r.energy.generation	This is not needed in OCF as only the absolute energy consumption is tracked.	significantDigits = 0

Table 52 provides the details of the Properties that are part of "onem2m.m.energygeneration".

Table 52 – The properties of "onem2m.m.energygeneration"

oneM2M Property name	Type	Required	Description
multiplyingFactors	number	no	The unit for data (multiplying factors)., e.g. 1 kWh, 0,1 kWh, 0,01 kWh etc.
roundingEnergyGeneration	integer	no	This energy generation data can be calculated by using significantFigures and multiplyingFactors.

oneM2M Property name	Type	Required	Description
powerGenerationData	number	no	Amount of instantaneous generation data.
significantDigits	integer	no	The number of effective digits for data.

9.26.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.energygeneration#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Energy Generation",
  "definitions": {
    "onem2m.m.energygeneration": {
      "type": "object",
      "properties": {
        "powerGenerationData": {
          "type": "number",
          "description": "Amount of instantaneous generation data.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.energy.generation",
            "x-to-ocf": [
              "oic.r.energy.generation.energygenerated = powerGenerationData;"
            ],
            "x-from-ocf": [
              "powerGenerationData = oic.r.energy.generation.energygenerated"
            ]
          }
        },
        "roundingEnergyGeneration": {
          "type": "integer",
          "description": "This energy generation data can be calculated by using significantFigures and
multiplyingFactors.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.energy.generation",
            "x-to-ocf": [
              "This is not needed in OCF as only the absolute energy consumption is tracked."
            ],
            "x-from-ocf": [
              "roundingEnergyConsumption = oic.r.energy.consumption.powerGenerationData"
            ]
          }
        },
        "significantDigits": {
          "type": "integer",
          "description": "The number of effective digits for data.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.energy.generation",
            "x-to-ocf": [
              "This is not needed in OCF as only the absolute energy consumption is tracked."
            ],
            "x-from-ocf": [
              "significantDigits = 0"
            ]
          }
        },
        "multiplyingFactors": {
          "type": "number",
          "description": "The unit for data (multiplying factors)., e.g. 1 kWh, 0,1 kWh, 0,01 kWh
etc.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.energy.generation",
            "x-to-ocf": [
              "This is not needed in OCF as only the absolute energy consumption is tracked."
            ],
            "x-from-ocf": [
```

```
              "multiplyingFactors = 1"
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.energygeneration"}
  ],
  "required": [ ]
}
```

9.27 Filter info

9.27.1 Derived model

The derived model: "onem2m.m.filterinfo".

9.27.2 Property definition

Table 53 provides the detailed per Property mapping for "onem2m.m.filterinfo".

Table 53 – The property mapping for "onem2m.m.filterinfo"

oneM2M Property name	OCF Resource	To OCF	From OCF
needsReplacement	oic.r.sensor	oic.r.sensor.value = needsReplacement	needsReplacement = oic.r.sensor.value
usedTime	oic.r.consumable	oic.r.consumable.typeofconsumable = "water filter"oic.r.consumable.usedtime = usedTime	usedTime = oic.r.consumable.usedtime
filterLifetime	oic.r.consumable	oic.r.consumable.remaining = filterLifetime	filterLifetime = oic.r.consumable.remaining

Table 54 provides the details of the Properties that are part of "onem2m.m.filterinfo".

Table 54 – The properties of "onem2m.m.filterinfo"

oneM2M Property name	Type	Required	Description
needsReplacement	boolean	no	This value indicates that the filter needs to be replaced.
usedTime	integer	yes	Cumulative used time in second of a filter.
filterLifetime	integer	no	Percentage life time remaining for the water filter.

9.27.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.filterinfo.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Filter Info",
  "definitions": {
    "onem2m.m.filterinfo": {
      "type": "object",
      "properties": {
        "usedTime": {
          "type": "integer",
          "description": "Cumulative used time in second of a filter.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.consumable",
            "x-to-ocf": [
              "oic.r.consumable.typeofconsumable = \"water filter\"",
              "oic.r.consumable.usedtime = usedTime"
            ],
            "x-from-ocf": [
              "usedTime = oic.r.consumable.usedtime"
            ]
          }
        },
        "needsReplacement": {
          "type": "boolean",
          "description": "This value indicates that the filter needs to be replaced.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.sensor",
            "x-to-ocf": [
              "oic.r.sensor.value = needsReplacement"
            ],
            "x-from-ocf": [
              "needsReplacement = oic.r.sensor.value"
            ]
          }
        },
        "filterLifetime": {
          "type": "integer",
          "description": "Percentage life time remaining for the water filter.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.consumable",
            "x-to-ocf": [
              "oic.r.consumable.remaining = filterLifetime"
            ],
            "x-from-ocf": [
              "filterLifetime = oic.r.consumable.remaining"
            ]
          }
        }
      }
    }
  }
```

```
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.filterinfo"}
  ],
  "required": [ "usedTime" ]
}
```

9.28 Foaming

9.28.1 Derived model

The derived model: "onem2m.m.foaming".

9.28.2 Property definition

Table 55 provides the detailed per Property mapping for "onem2m.m.foaming".

Table 55 – The property mapping for "onem2m.m.foaming"

oneM2M Property name	OCF Resource	To OCF	From OCF
foamingStrength	oic.r.foaming	oic.r.foaming.foamstrength = foamingStrength	foamingStrength = oic.r.foaming.foamstrength

Table 56 provides the details of the Properties that are part of "onem2m.m.foaming".

Table 56 – The properties of "onem2m.m.foaming"

oneM2M Property name	Type	Required	Description
foamingStrength	integer	yes	The current strength of foamed milk. A higher value indicates a milk which is more foamed.

9.28.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.foaming.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Foaming",
  "definitions": {
    "onem2m.m.foaming": {
      "type": "object",
      "properties": {
        "foamingStrength": {
          "type": "integer",
          "description": "The current strength of foamed milk. A higher value indicates a milk which is
more foamed.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.foaming",
            "x-to-ocf": [
              "oic.r.foaming.foamstrength = foamingStrength"
            ],
```

```
            "x-from-ocf": [
              "foamingStrength = oic.r.foaming.foamstrength"
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.foaming"}
  ],
  "required": [ "foamingStrength" ]
}
```

9.29 Grinder

9.29.1 Derived model

The derived model: "onem2m.m.grinder".

9.29.2 Property definition

Table 57 provides the detailed per Property mapping for "onem2m.m.grinder".

Table 57 – The property mapping for "onem2m.m.grinder"

oneM2M Property name	OCF Resource	To OCF	From OCF
useGrinder	oic.r.switch.binary	oic.r.switch.binary.value = foamingStrength	foamingStrength = oic.r.switch.binary.value
grainsRemaining	oic.r.grinder	oic.r.grinder.remaining = remaining / 20	remaining = oic.r.grinder.remaining * 20
coarseness	oic.r.grinder	oic.r.grinder.coarseness = coarseness	coarseness = oic.r.grinder.coarseness

Table 58 provides the details of the Properties that are part of "onem2m.m.grinder".

Table 58 – The properties of "onem2m.m.grinder"

oneM2M Property name	Type	Required	Description
useGrinder	boolean	yes	The current status of the grinder enablement. True indicates enabled, and False indicates not enabled.
grainsRemaining	integer	no	The level of remaining grains in a machine having a grinder e.g. remaining coffee beans in the coffee machine grinder.
coarseness	integer	no	The wished coarseness of the solid supplies e.g. coffee beans, after grinding.

9.29.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.grinder.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Grinder",
  "definitions": {
    "onem2m.m.grinder": {
      "type": "object",
      "properties": {
        "useGrinder": {
          "type": "boolean",
          "description": "The current status of the grinder enablement. True indicates enabled, and
False indicates not enabled.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.switch.binary",
            "x-to-ocf": [
              "oic.r.switch.binary.value = foamingStrength"
            ],
            "x-from-ocf": [
              "foamingStrength = oic.r.switch.binary.value"
            ]
          }
        },
        "coarseness": {
          "type": "integer",
          "description": "The wished coarseness of the solid supplies e.g. coffee beans, after
grinding.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.grinder",
            "x-to-ocf": [
              "oic.r.grinder.coarseness = coarseness"
            ],
            "x-from-ocf": [
              "coarseness = oic.r.grinder.coarseness"
            ]
          }
        },
        "grainsRemaining": {
          "type": "integer",
          "description": "The level of remaining grains in a machine having a grinder e.g. remaining
```

```
coffee beans in the coffee machine grinder.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.grinder",
            "x-to-ocf": [
              "oic.r.grinder.remaining = remaining / 20"
            ],
            "x-from-ocf": [
              "remaining = oic.r.grinder.remaining * 20"
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.grinder"}
  ],
  "required": [ "useGrinder" ]
}
```

9.30 Heating zone

9.30.1 Derived model

The derived model: "onem2m.m.heatingzone".

9.30.2 Property definition

Table 59 provides the detailed per Property mapping for "onem2m.m.heatingzone".

Table 59 – The property mapping for "onem2m.m.heatingzone"

oneM2M Property name	OCF Resource	To OCF	From OCF
maxHeatingLevel	oic.r.heatingzone	oic.r.heatingzone.maxheatinglevel = maxHeatingLevel	maxHeatingLevel = oic.r.heatingzone.maxheatinglevel
heatingLevel	oic.r.heatingzone	oic.r.heatingzone.heatinglevel = heatingLevel	heatingLevel = oic.r.heatingzone.heatinglevel

Table 60 provides the details of the Properties that are part of "onem2m.m.heatingzone".

Table 60 – The properties of "onem2m.m.heatingzone"

oneM2M Property name	Type	Required	Description
maxHeatingLevel	integer	yes	The maximum value allowed for the heating level of the zone
heatingLevel	integer	yes	The current heating level of the zone. The value range is from 0 (indicating that the zone is not heating) up to the maxHeatingLevel

9.30.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.heatingzone.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Heating Zone",
  "definitions": {
    "onem2m.m.heatingzone": {
      "type": "object",
      "properties": {
        "heatingLevel": {
          "type": "integer",
          "description": "The current heating level of the zone. The value range is from 0 (indicating
that the zone is not heating) up to the maxHeatingLevel",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.heatingzone",
            "x-to-ocf": [
              "oic.r.heatingzone.heatinglevel = heatingLevel"
            ],
            "x-from-ocf": [
              "heatingLevel = oic.r.heatingzone.heatinglevel"
            ]
          }
        },
        "maxHeatingLevel": {
          "type": "integer",
          "description": "The maximum value allowed for the heating level of the zone",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.heatingzone",
            "x-to-ocf": [
              "oic.r.heatingzone.maxheatinglevel = maxHeatingLevel"
            ],
            "x-from-ocf": [
              "maxHeatingLevel = oic.r.heatingzone.maxheatinglevel"
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.heatingzone"}
  ],
  "required": [ "heatingLevel", "maxHeatingLevel" ]
}
```

9.31 Height

9.31.1 Derived model

The derived model: "onem2m.m.height".

9.31.2 Property definition

Table 61 provides the detailed per Property mapping for "onem2m.m.height".

Table 61 – The property mapping for "onem2m.m.height"

oneM2M Property name	OCF Resource	To OCF	From OCF
height	oic.r.height	oic.r.height.height = heightoic.r.height.units = cm	oneOf

Table 62 provides the details of the Properties that are part of "onem2m.m.height".

Table 62 – The properties of "onem2m.m.height"

oneM2M Property name	Type	Required	Description
height	number	yes	Measurement of height

9.31.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.height.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Height",
  "definitions": {
    "onem2m.m.height": {
      "type": "object",
      "properties": {
        "height": {
          "type": "number",
          "description": "Measurement of height",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.height",
            "x-to-ocf": [
              "oic.r.height.height = height",
              "oic.r.height.units = cm"
            ],
            "x-from-ocf": {
              "oneOf": [
                {
                  "properties": {
                    "oic.r.height.units": "string",
                    "enum": ["cm"]
                  },
                  "x-from-ocf": [
                    "height = oic.r.height.height"
                  ]
                },
                {
```



```
                "properties": {
                  "oic.r.height.units": "string",
                  "enum": ["m"]
                },
                "x-from-ocf": [
                  "height = oic.r.height.height*100"
                ]
              },
              {
                "properties": {
                  "voic.r.height.units": "string",
                  "enum": ["ft"]
                },
                "x-from-ocf": [
                  "height = oic.r.height.height*30.48"
                ]
              },
              {
                "properties": {
                  "oic.r.height.units": "string",
                  "enum": ["in"]
                },
                "x-from-ocf": [
                  "height = oic.r.height.height*2.54"
                ]
              }
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.height"}
  ],
  "required": [ "height" ]
}
```


9.32 Hot water supply

9.32.1 Derived model

The derived model: "onem2m.m.hotwatersupply".

9.32.2 Property definition

Table 63 provides the detailed per Property mapping for "onem2m.m.hotwatersupply".

Table 63 – The property mapping for "onem2m.m.hotwatersupply"

oneM2M Property name	OCF Resource	To OCF	From OCF
bath	oic.r.switch.binary	oic.r.switch.binary.value = bath	bath = oic.r.switch.binary.value
status	oic.r.sensor	oic.r.sensor.value = status	status = oic.r.sensor.value

Table 64 provides the details of the Properties that are part of "onem2m.m.hotwatersupply".

Table 64 – The properties of "onem2m.m.hotwatersupply"

oneM2M Property name	Type	Required	Description
bath	boolean	no	The status of filling bath tub.
status	boolean	yes	The status of watering operation.

9.32.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.hotwatersupply.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Hot Water Supply",
  "definitions": {
    "onem2m.m.hotwatersupply": {
      "type": "object",
      "properties": {
        "status": {
          "type": "boolean",
          "description": "The status of watering operation.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.sensor",
            "x-to-ocf": [
              "oic.r.sensor.value = status"
            ],
            "x-from-ocf": [
              "status = oic.r.sensor.value"
            ]
          }
        },
        "bath": {
          "type": "boolean",
          "description": "The status of filling bath tub.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.switch.binary",
            "x-to-ocf": [
              "oic.r.switch.binary.value = bath"
            ],
            "x-from-ocf": [
              "bath = oic.r.switch.binary.value"
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.hotwatersupply"}
  ],
  "required": [ "status" ]
}
```

9.33 Impact sensor

9.33.1 Derived model

The derived model: "onem2m.m.impactsensor".

9.33.2 Property definition

Table 65 provides the detailed per Property mapping for "onem2m.m.impactsensor".

Table 65 – The property mapping for "onem2m.m.impactsensor"

oneM2M Property name	OCF Resource	To OCF	From OCF
impactStatus	oic.r.impactsensor	oic.r.impactsensor.impactstatus = impactStatus	impactStatus = oic.r.impactsensor.impactstatus
impactDirectionVertical	oic.r.impactsensor	oic.r.impactsensor.impactdirectionvertical = impactDirectionVertical	impactDirectionVertical = oic.r.impactsensor.impactdirectionvertical
impactDirectionHorizontal	oic.r.impactsensor	oic.r.impactsensor.impactdirectionhorizontal = impactDirectionHorizontal	impactDirectionHorozintal = oic.r.impactsensor.impactdirectionhorizontal
impactLevel	oic.r.impactsensor	oic.r.impactsensor.impactlevel = impactLevel	impactLevel= oic.r.impactsensor.impactlevel

Table 66 provides the details of the Properties that are part of "onem2m.m.impactsensor".

Table 66 – The properties of "onem2m.m.impactsensor"

oneM2M Property name	Type	Required	Description
impactStatus	boolean	no	The impactStatus indicates as follows: (True) A physical impact is detected / (False) Normal status, an impact is not detected
impactDirectionVertical	number	no	The impactDirectionVertical shows a vertical direction where the impact comes from. The value is 0 to 360 degrees. 0 is the front of the sensor and upward increment.

oneM2M Property name	Type	Required	Description
impactDirectionHorizontal	number	no	The impactDirectionHorizontal shows a horizontal direction where the impact comes from. The value is 0 to 360 degrees. 0 is the front of the sensor and clockwise increment.
impactLevel	number	no	The impactLevel provides the level of impact which unit is "G" (G-force).

9.33.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.impactsensor.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc.  All rights reserved.",
  "title": "Impact Sensor",
  "definitions": {
    "onem2m.m.impactsensor": {
      "type": "object",
      "properties": {
        "impactStatus": {
          "type": "boolean",
          "description": "The impactStatus indicates as follows: (True) A physical impact is detected /
(False) Normal status, an impact is not detected",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.impactsensor",
            "x-to-ocf": [
              "oic.r.impactsensor.impactstatus = impactStatus"
            ],
            "x-from-ocf": [
              "impactStatus = oic.r.impactsensor.impactstatus"
            ]
          }
        },
        "impactLevel": {
          "type": "number",
          "description": "The impactLevel provides the level of impact which unit is \"G\" (G-force).",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.impactsensor",
            "x-to-ocf": [
              "oic.r.impactsensor.impactlevel = impactLevel"
            ],
            "x-from-ocf": [
              "impactLevel= oic.r.impactsensor.impactlevel"
           ]
          }
        },
        "impactDirectionHorizontal": {
          "type": "number",
          "description": "The impactDirectionHorizontal shows a horizontal direction where the impact
comes from. The value is 0 to 360 degrees. 0 is the front of the sensor and clockwise increment.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.impactsensor",
            "x-to-ocf": [
              "oic.r.impactsensor.impactdirectionhorizontal = impactDirectionHorizontal"
            ],
            "x-from-ocf": [
              "impactDirectionHorozintal = oic.r.impactsensor.impactdirectionhorizontal"
           ]
          }
        },
        "impactDirectionVertical": {
          "type": "number",
          "description": "The impactDirectionVertical shows a vertical direction where the impact comes
```

```
from. The value is 0 to 360 degrees. 0 is the front of the sensor and upward increment.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.impactsensor",
            "x-to-ocf": [
              "oic.r.impactsensor.impactdirectionvertical = impactDirectionVertical"
            ],
            "x-from-ocf": [
              "impactDirectionVertical = oic.r.impactsensor.impactdirectionvertical"
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.impactsensor"}
  ],
  "required": [ "impactstatus" ]
}
```

9.34 Keep warm

9.34.1 Derived model

The derived model: "onem2m.m.keepwarm".

9.34.2 Property definition

Table 67 provides the detailed per Property mapping for "onem2m.m.keepwarm".

Table 67 – The property mapping for "onem2m.m.keepwarm"

oneM2M Property name	OCF Resource	To OCF	From OCF
time	oic.r.time.period	oic.r.time.period.interval = timeoic.r.time.period.starttime = 0	time = oic.r.time.period.interval

Table 68 provides the details of the Properties that are part of "onem2m.m.keepwarm".

Table 68 – The properties of "onem2m.m.keepwarm"

oneM2M Property name	Type	Required	Description
time	integer	no	The desired duration of 'keep water warm' function. It indicates how long water shall be kept warm e.g. after the boiling in the case of a kettle. The value indicates a time expressed in minutes.

9.34.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.keepwarm.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Keep Warm",
  "definitions": {
    "onem2m.m.keepwarm": {
      "type": "object",
      "properties": {
        "time": {
          "type": "integer",
          "description": "The desired duration of 'keep water warm' function. It indicates how long
water shall be kept warm e.g. after the boiling in the case of a kettle. The value indicates a time
expressed in minutes.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.time.period",
            "x-to-ocf": [
              "oic.r.time.period.interval = time",
              "oic.r.time.period.starttime = 0"
            ],
            "x-from-ocf": [
              "time = oic.r.time.period.interval"
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.keepwarm"}
  ],
  "required": [ ]
}
```

9.35 Keypad

9.35.1 Derived model

The derived model: "onem2m.m.keypad".

9.35.2 Property definition

Table 69 provides the detailed per Property mapping for "onem2m.m.keypad".

Table 69 – The property mapping for "onem2m.m.keypad"

oneM2M Property name	OCF Resource	To OCF	From OCF
keyNumber	oic.r.keypadchar	Need to translate between the oneM2M integer value and the OCF enumerated stringif (keyNumber == 0) { oic.r.keypadchar.keyvalue == "0"; }if (keyNumber == 1) { oic.r.keypadchar.keyvalue == "1"; }if (keyNumber == 2) { oic.r.keypadchar.keyvalue == "2"; }if (keyNumber == 3) { oic.r.keypadchar.keyvalue == "3"; }if (keyNumber == 4) { oic.r.keypadchar.keyvalue == "4"; }if (keyNumber == 5) { oic.r.keypadchar.keyvalue == "5"; }if (keyNumber == 6) { oic.r.keypadchar.keyvalue == "6"; }if (keyNumber == 7) { oic.r.keypadchar.keyvalue == "7"; }if (keyNumber == 8) { oic.r.keypadchar.keyvalue == "8"; }if (keyNumber == 9) { oic.r.keypadchar.keyvalue == "9"; }	Need to translate between the OCF enumerated string and the oneM2M integer valueif (oic.r.keypadchar.keyvalue == "0") { keyNumber = 0; }if (oic.r.keypadchar.keyvalue == "1") { keyNumber = 1; }if (oic.r.keypadchar.keyvalue == "2") { keyNumber = 2; }if (oic.r.keypadchar.keyvalue == "3") { keyNumber = 3; }if (oic.r.keypadchar.keyvalue == "4") { keyNumber = 4; }if (oic.r.keypadchar.keyvalue == "5") { keyNumber = 5; }if (oic.r.keypadchar.keyvalue == "6") { keyNumber = 6; }if (oic.r.keypadchar.keyvalue == "7") { keyNumber = 7; }if (oic.r.keypadchar.keyvalue == "8") { keyNumber = 8; }if (oic.r.keypadchar.keyvalue == "9") { keyNumber = 9; }

Table 70 provides the details of the Properties that are part of "onem2m.m.keypad".

Table 70 – The properties of "onem2m.m.keypad"

oneM2M Property name	Type	Required	Description
keyNumber	integer	yes	The number of key.

9.35.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.keypad.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Keypad",
  "definitions": {
    "onem2m.m.keypad": {
      "type": "object",
```

```
      "properties": {
        "keyNumber": {
          "type": "integer",
          "description": "The number of key.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.keypadchar",
            "x-to-ocf": [
              "Need to translate between the oneM2M integer value and the OCF enumerated string",
              "if ( keyNumber == 0 ) { oic.r.keypadchar.keyvalue == \"0\"; }",
              "if ( keyNumber == 1 ) { oic.r.keypadchar.keyvalue == \"1\"; }",
              "if ( keyNumber == 2 ) { oic.r.keypadchar.keyvalue == \"2\"; }",
              "if ( keyNumber == 3 ) { oic.r.keypadchar.keyvalue == \"3\"; }",
              "if ( keyNumber == 4 ) { oic.r.keypadchar.keyvalue == \"4\"; }",
              "if ( keyNumber == 5 ) { oic.r.keypadchar.keyvalue == \"5\"; }",
              "if ( keyNumber == 6 ) { oic.r.keypadchar.keyvalue == \"6\"; }",
              "if ( keyNumber == 7 ) { oic.r.keypadchar.keyvalue == \"7\"; }",
              "if ( keyNumber == 8 ) { oic.r.keypadchar.keyvalue == \"8\"; }",
              "if ( keyNumber == 9 ) { oic.r.keypadchar.keyvalue == \"9\"; }"
            ],
            "x-from-ocf": [
              "Need to translate between the OCF enumerated string and the oneM2M integer value",
              "if (oic.r.keypadchar.keyvalue == \"0\" ) { keyNumber = 0; }",
              "if (oic.r.keypadchar.keyvalue == \"1\" ) { keyNumber = 1; }",
              "if (oic.r.keypadchar.keyvalue == \"2\" ) { keyNumber = 2; }",
              "if (oic.r.keypadchar.keyvalue == \"3\" ) { keyNumber = 3; }",
              "if (oic.r.keypadchar.keyvalue == \"4\" ) { keyNumber = 4; }",
              "if (oic.r.keypadchar.keyvalue == \"5\" ) { keyNumber = 5; }",
              "if (oic.r.keypadchar.keyvalue == \"6\" ) { keyNumber = 6; }",
              "if (oic.r.keypadchar.keyvalue == \"7\" ) { keyNumber = 7; }",
              "if (oic.r.keypadchar.keyvalue == \"8\" ) { keyNumber = 8; }",
              "if (oic.r.keypadchar.keyvalue == \"9\" ) { keyNumber = 9; }"
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.keypad"}
  ],
  "required": [ "keyNumber" ]
}
```

9.36 Liquid level

9.36.1 Derived model

The derived model: "onem2m.m.liquidlevel".

9.36.2 Property definition

Table 71 provides the detailed per Property mapping for "onem2m.m.liquidlevel".

Table 71 – The property mapping for "onem2m.m.liquidlevel"

oneM2M Property name	OCF Resource	To OCF	From OCF
liquidLevel	oic.r.liquid.level	oic.r.liquid.level.desiredlevel = liquidLevel * 20	liquidLevel = oic.r.liquid.level.desiredlevel / 20

Table 72 provides the details of the Properties that are part of "onem2m.m.liquidlevel".

Table 72 – The properties of "onem2m.m.liquidlevel"

oneM2M Property name	Type	Required	Description
liquidLevel	integer	no	The desired level of liquid

9.36.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.liquidlevel.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Liquid Level",
  "definitions": {
    "onem2m.m.liquidlevel": {
      "type": "object",
      "properties": {
        "liquidLevel": {
          "type": "integer",
          "description": "The desired level of liquid",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.liquid.level",
            "x-to-ocf": [
              "oic.r.liquid.level.desiredlevel = liquidLevel * 20"
            ],
            "x-from-ocf": [
              "liquidLevel = oic.r.liquid.level.desiredlevel / 20"
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.liquidlevel"}
  ],
  "required": [ "liquidlevel" ]
}
```

9.37 Liquid remaining

9.37.1 Derived model

The derived model: "onem2m.m.liquidremaining".

9.37.2 Property definition

Table 73 provides the detailed per Property mapping for "onem2m.m.liquidremaining".

Table 73 – The property mapping for "onem2m.m.liquidremaining"

oneM2M Property name	OCF Resource	To OCF	From OCF
liquidRemaining	oic.r.liquid.level	This value is 0-5 in oneM2M and 0-100 in OCF, so do the arithmetic conversionoic.r.liquid.level.currentlevel = liquidRemaining * 20	This value is 0-5 in oneM2M and 0-100 in OCF, so do the arithmetic conversionliquidRemaining = oic.r.liquid.level.currentlevel / 20

Table 74 provides the details of the Properties that are part of "onem2m.m.liquidremaining".

Table 74 – The properties of "onem2m.m.liquidremaining"

oneM2M Property name	Type	Required	Description
liquidRemaining	integer	yes	The remaining level of liquid

9.37.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.liquidremaining.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Liquid Remaining",
  "definitions": {
    "onem2m.m.liquidremaining": {
      "type": "object",
      "properties": {
        "liquidRemaining": {
          "type": "integer",
          "description": "The remaining level of liquid",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.liquid.level",
            "x-to-ocf": [
              "This value is 0-5 in oneM2M and 0-100 in OCF, so do the arithmetic conversion",
              "oic.r.liquid.level.currentlevel = liquidRemaining * 20"
            ],
            "x-from-ocf": [
              "This value is 0-5 in oneM2M and 0-100 in OCF, so do the arithmetic conversion",
              "liquidRemaining = oic.r.liquid.level.currentlevel / 20"
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.liquidremaining"}
  ],
  "required": [ "liquidRemaining" ]
}
```

9.38 Lock

9.38.1 Derived model

The derived model: "onem2m.m.lock".

9.38.2 Property definition

Table 75 provides the detailed per Property mapping for "onem2m.m.lock".

Table 75 – The property mapping for "onem2m.m.lock"

oneM2M Property name	OCF Resource	To OCF	From OCF
lock	oic.r.lock	if lock oic.r.lock.status.lockState = "Locked"if !lock oic.r.lock.status.lockState = "Unlocked"	lock = (oic.r.lock.status.lockState == "Locked")

Table 76 provides the details of the Properties that are part of "onem2m.m.lock".

Table 76 – The properties of "onem2m.m.lock"

oneM2M Property name	Type	Required	Description
lock	boolean	yes	'True' indicates the object is locked, while 'False' indicates the object is not locked.

9.38.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.lock.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description": "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "lock",
  "definitions": {
    "onem2m.m.lock": {
      "type": "object",
      "properties": {
        "lock": {
          "type": "boolean",
          "description": "'True' indicates the object is locked, while 'False' indicates the object is
not locked.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.lock",
            "x-to-ocf": [
              "if lock oic.r.lock.status.lockState = \"Locked\"",
              "if !lock oic.r.lock.status.lockState = \"Unlocked\""
            ],
            "x-from-ocf": [
              "lock = (oic.r.lock.status.lockState == \"Locked\")"
            ]
          }
        }
      }
```

```
    }
  },
  "type": "object",
  "allOf": [{
    "$ref": "#/definitions/onem2m.m.lock"
  }],
  "required": ["lock"]
}
```

9.39 Motion sensor

9.39.1 Derived model

The derived model: "onem2m.m.motionSensor".

9.39.2 Property definition

Table 77 provides the detailed per Property mapping for "onem2m.m.motionSensor".

Table 77 – The property mapping for "onem2m.m.motionSensor"

oneM2M Property name	OCF Resource	To OCF	From OCF
motionSensor	oic.r.sensor.motion	oic.r.sensor.motion.value = alarm	alarm = oic.r.sensor.motion.value
silentTime	oic.r.sensor.props	oic.r.sensor.props.silenttime = silentTime	silentTime = oic.r.sensor.props.silenttime
sensitivity	oic.r.sensor.props	oic.r.sensor.props.sensitivity = sensitivityOCF sensitivity is a number and oneM2M sensitivity is an integer, so this arithmetic assignment works, but an arithmetic conversion may be necessary depending on how the value is interpreted	sensitivity = oic.r.sensor.props.sensitivityOCF sensitivity is a number and the oneM2M is an integer, so arithmetic conversion may be necessary depending on how the value is interpreted

Table 78 provides the details of the Properties that are part of "onem2m.m.motionSensor".

Table 78 – The properties of "onem2m.m.motionSensor"

oneM2M Property name	Type	Required	Description
motionSensor	boolean	no	Alarm State
silentTime	integer	no	Silent Time
sensitivity	number	no	Sensitivity

9.39.3 Derived model definition

```
{
  "id": "http://openinterconnect.org/onem2mmapping/schemas/onem2m.m.motionsensor.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright  (c) 2019 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Motion Sensor",
  "definitions": {
    "onem2m.m.motionSensor": {
      "type": "object",
      "properties": {
        "motionSensor": {
          "type": "boolean",
          "description": "Alarm State",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.sensor.motion",
            "x-to-ocf": [
              "oic.r.sensor.motion.value = alarm"
            ],
            "x-from-ocf": [
              "alarm = oic.r.sensor.motion.value"
            ]
          }
        },
        "silentTime": {
          "type": "integer",
          "description": "Silent Time",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.sensor.props",
            "x-to-ocf": [
              "oic.r.sensor.props.silenttime = silentTime"
            ],
            "x-from-ocf": [
              "silentTime = oic.r.sensor.props.silenttime"
            ]
          }
        },
        "sensitivity": {
          "type": "number",
          "description": "Sensitivity",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.sensor.props",
            "x-to-ocf": [
              "oic.r.sensor.props.sensitivity = sensitivity",
              "OCF sensitivity is a number and oneM2M sensitivity is an integer, so this arithmetic
assignment works, but an arithmetic conversion may be necessary depending on how the value is
interpreted"
            ],
            "x-from-ocf": [
              "sensitivity = oic.r.sensor.props.sensitivity",
              "OCF sensitivity is a number and the oneM2M is an integer, so arithmetic conversion may
be necessary depending on how the value is interpreted"
            ]
          }
        }
      }
    }
  },
  "type": "object",
  "allOf": [
    {"$ref": "#/definitions/onem2m.m.motionsensor"}
  ],
  "required": [ "alarm" ]
}
```

9.40 Open level

9.40.1 Derived model

The derived model: "onem2m.m.openlevel".

9.40.2 Property definition

Table 79 provides the detailed per Property mapping for "onem2m.m.openlevel".

Table 79 – The property mapping for "onem2m.m.openlevel"

oneM2M Property name	OCF Resource	To OCF	From OCF
openLevel	oic.r.openlevel	oic.r.openlevel.openLevel = openLevel	openLevel = oic.r.openlevel.openLevel
maxLevel	oic.r.openlevel	oic.r.openlevel.range[1] = maxLevel	maxLevel = oic.r.openlevel.range[1]
stepValue	oic.r.openlevel	oic.r.openlevel.increment = stepValue	stepValue = oic.r.openlevel.increment
minLevel	oic.r.openlevel	oic.r.openlevel.range[0] = minLevel	minLevel = oic.r.openlevel.range[0]

Table 80 provides the details of the Properties that are part of "onem2m.m.openlevel".

Table 80 – The properties of "onem2m.m.openlevel"

oneM2M Property name	Type	Required	Description
openLevel	integer	yes	The rounded percentage of the current open level of entity in the range of [0, 100]. 0 percentage shall mean the entity is closed.
maxLevel	integer	no	The maximum value allowed for the "openLevel" status. The default value is 100, which means fully opened.
stepValue	integer	no	The step value used by the "open" and "close" actions.
minLevel	integer	no	The minimum value allowed for the "openLevel" status. The default value is 0, which means fully closed.