



UCIFI DEVICE DATA MODEL

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1. Objective of the uCIFI Alliance

The objective of the uCIFI Alliance is to unlock the Smart City and Smart Utility markets by providing interoperability and interchangeability between IoT devices from various vendors connected to LPWAN network such as LoRaWAN, NB-IoT, long-range mesh network or any other IoT network. Amongst other missions, the uCIFI Alliance aims at defining a **unified constrained device data model** that allows cities and utilities to deploy IoT devices from any vendor on these LPWAN networks without the need to spend money on integrating proprietary data payloads and data meanings into their IoT platforms, their central management software and other smart city applications.

Today, outdoor lighting controllers, air quality sensors or smart meters from two different vendors communicating on a LoRaWAN or NB-IoT network have their own proprietary data payload, making it difficult for integrators to provide an interoperable solution without specific integration services and the impossibility to replace a device from supplier A by an equivalent device from supplier B without additional integration effort.

With the uCIFI device data model, IoT devices will talk the same language. They will provide data with the same agreed payload format and attributes (i.e. the words in a language), so that integrators can provide interoperable smart city and smart utility solutions to their customers. Thanks to the uCIFI device data model, IoT devices can be replaced by other functionally equivalent devices from a competitor, so that end-customers shall not be dependent from one single supplier to deploy their IoT solutions at scale.

The uCIFI Alliance is funded by industrial companies and supported by end-customers such as Cities and Utilities. The uCIFI Alliance designs and promotes efficient and open-source solutions to prevent end-customers to be locked with proprietary systems. The uCIFI Alliance does not just create another standard but the uCIFI members are committed to provide easy-to-implement solutions based on existing, proven and widely implemented technologies such as LwM2M from the Open Mobile Alliance.



2. About this document

This document provides the detailed description of the uCIFI device data model. With this document, vendors can adopt and implement the uCIFI device data model in their connected device so that it is interoperable with other uCIFI-compliant devices and easier to integrate by smart city and utility integrators.

3. Use Cases addressed by the uCIFI Alliance

3.1. Target vertical markets

The goal of uCIFI is to bring interoperability and interchangeability between IoT devices on LPWAN networks, for the following vertical markets:

- Smart utility and particularly:
 - Electrical metering
 - Gas metering
- Smart city and particularly:
 - Smart streetlight
 - Individual light point control including dynamic lighting
 - Cabinet control
 - Building energy efficiency
 - Smart water and particularly:
 - Water metering and leak detection
 - Water quality
 - Water irrigation
 - Water pressure monitoring in water distribution pipelines
 - Environmental monitoring (e.g. outdoor air quality)
 - Safety and particularly:
 - Crowd management
 - Noise monitoring
 - Panic button
 - Smart waste (e.g. filling sensors on voluntary drop-off containers)
 - Smart mobility and particularly:
 - Vehicle traffic counting
 - Parking place detection

3.2. uCIFI use cases and associated devices

To bring interoperability to these vertical markets, the uCIFI device data model aims to provide device attributes for the following list of device types to support the following use cases:

Device Type	RFD or FFD*	Use Case
Electrical meters	FFD	<ul style="list-style-type: none"> • From IoT device to central application <ul style="list-style-type: none"> • Send electrical metering data (e.g. kWh, P, U, I, cos phi) at periodic interval • Send events/alarms when electrical parameters and/or temperature are out of range • From central application to IoT device <ul style="list-style-type: none"> • Read electrical metering data from one or from a group of meter(s) • Connect/disconnect meter(s) remotely • Update tariff information remotely, particularly when they are required for prepaid metering • Remotely configure alarm thresholds • Read meter's configuration attributes, including data collect intervals • Send load switching commands • Recharge local meter (prepaid electricity)
Connected outdoor lights	FFD	<ul style="list-style-type: none"> • From IoT device to central application <ul style="list-style-type: none"> • Send LED, lamp and/or driver and electrical failure event/alarms when detected • Send electrical data when status changes (e.g. after switch ON time or when dimming level changes) or at fixed interval • From central application to IoT device <ul style="list-style-type: none"> • Read energy metering data from one or more connected outdoor light • Send lists of commands to program light levels remotely depending on sunrise/sunset and times/days • Send a manual override commands to one or more outputs on one or more luminaire controller(s) • Update configuration attributes (e.g. alarm threshold, dynamic lighting configuration, lamp type parameters) • Send ON/OFF switch commands to groups of connected outdoor lights around sunrise/sunset, depending on ambient light level measured centrally • From IoT device to IoT device <ul style="list-style-type: none"> • Local luminance sensors sending ON/OFF commands to a group of connected outdoor lights on the network • Presence-based lighting: presence sensor sends messages to a list of outdoor lighting controllers around to go to a higher light level



		<ul style="list-style-type: none"> • Follow-me lighting: one or more motion sensor(s) detecting a car, a bike or a pedestrian sends messages to a series of luminaires which increase light levels along with the vehicle/pedestrian (i.e. follow-me lighting) • Environment-dependent lighting: light adjustment depending on events from multiple type of sensors (e.g. sound, light, presence)
Data bridge	FFD	<ul style="list-style-type: none"> • From IoT device to central application <ul style="list-style-type: none"> • Send a proprietary set of data or payload that is read from a device (even a non-uCIFI device) connected to the uCIFI-compliant data bridge, in a transparent way without changing the payload • From central application to IoT device <ul style="list-style-type: none"> • Send a proprietary command or payload to a device (even a non-uCIFI device) connected to a uCIFI-compliant data bridge, in a transparent way without changing the payload
Gas meter	RFD	<ul style="list-style-type: none"> • From IoT device to central application <ul style="list-style-type: none"> • Send cumulated gas metering at periodic interval • Send events/alarms when gas consumption is not normal, temperature is getting high and/or pressure is getting high/low • Send alarm when battery of the transmitter is getting low • From central application to IoT device <ul style="list-style-type: none"> • Read gas metering data from one or from a group of meter(s) • Connect/disconnect gas meter(s) remotely • Update tariff information remotely • Remotely configure alarm thresholds • Read gas meter's configuration attributes • Recharge local meter (prepaid gas)
Water meter	RFD	<ul style="list-style-type: none"> • From IoT device to central application <ul style="list-style-type: none"> • Send cumulated water metering at periodic interval • Send events/alarms such as water leaks and high/low pressure • Send alarm when battery of the transmitter is getting low • From central application to IoT device <ul style="list-style-type: none"> • Read water metering data from one or from a group of meter(s) • Connect/disconnect water meter(s) remotely

		<ul style="list-style-type: none"> • Update tariff information remotely • Remotely configure alarm thresholds • Configure parameters (e.g. sampling rate) • Read water meter's configuration attributes • Recharge water meter (prepaid water)
Temperature and/or humidity sensor	Both	<ul style="list-style-type: none"> • From IoT device to central application <ul style="list-style-type: none"> • Send temperature and humidity log data at periodic interval and/or when data is above/below threshold • Send alarms when values are above/below thresholds (e.g. high temperature) • Send alarm when battery of the transmitter is getting low • From central application to IoT device <ul style="list-style-type: none"> • Read sensor data on one or a group of sensor(s) • Remotely configure alarm thresholds • From IoT device to IoT device <ul style="list-style-type: none"> • Humidity sensor sending messages to water irrigation valves when ground humidity is either too high or not sufficient
Noise sensor	Both	<ul style="list-style-type: none"> • From IoT device to central application <ul style="list-style-type: none"> • Send decibel log values at periodic interval and/or when data is above/below threshold • Send events/alarms (e.g. abnormal noise) • Send gunshot alarms • Send alarm when battery of the transmitter is getting low • From central application to IoT device <ul style="list-style-type: none"> • Configure alarm thresholds • From IoT device to IoT device <ul style="list-style-type: none"> • Send message to outdoor light controllers in the area to increase light level when abnormal noise is detected
Air quality sensor	Both	<ul style="list-style-type: none"> • From IoT device to central application <ul style="list-style-type: none"> • Send PM10, PM2.5, PM1, NO2, CO, CO2, SO2, VOX and other air quality data at periodic interval and/or when data is above/below threshold • Send alarms when values are higher than configured thresholds (e.g. high PM2.5 rate) • Send alarm when sensor require maintenance and/or calibration • For sensors with solar panel and battery: <ul style="list-style-type: none"> • Send information about the solar panel efficiency (e.g. DC voltage/current) • From central application to IoT device

		<ul style="list-style-type: none"> • Read air quality sensor data from one or a group of sensor(s) • Remotely configure alarm thresholds • Remotely calibrate the sensor • From IoT device to IoT device <ul style="list-style-type: none"> • Air quality sensors sending commands to gas meters when gas leak is detected
Filling level sensor	RFD	<ul style="list-style-type: none"> • From IoT device to central application <ul style="list-style-type: none"> • Send filling level and battery level at periodic interval • Send user identification in case of “Pay-as-you-Throw” access control mechanism on the container • Send high temperature event “wrong position” (i.e. container not in upright position) alarms • From central application to IoT device <ul style="list-style-type: none"> • Update configuration parameters (e.g. container height or volume, type of hook and measure, sampling rate) • Remote sensor calibration • From IoT device to IoT device <ul style="list-style-type: none"> • Send/receive message to/from waste truck when emptying a waste container for identification and updating configuration attributes
Water irrigation valve	RFD	<ul style="list-style-type: none"> • From IoT device to central application <ul style="list-style-type: none"> • Send valve status • Send “valve blocked” and high/low water pressure alarms • From central application to IoT device <ul style="list-style-type: none"> • Send manual override command to open/close the valve • Send schedulers to program the days/time when the valve should open/close • From IoT device to IoT device <ul style="list-style-type: none"> • Ground humidity sensor, temperature sensor and ambient light sensor sending information to open/close the valve
Water pressure gauge	RFD	<ul style="list-style-type: none"> • From IoT device to central application <ul style="list-style-type: none"> • Send event/alarm each time pressure is above/below various high/low thresholds • Send pressure log values periodically • From central application to IoT device <ul style="list-style-type: none"> • Remotely test and calibrate the sensor

Water quality sensor	RFD	<ul style="list-style-type: none"> • From IoT device to central application <ul style="list-style-type: none"> • Send alarms when level of chlorine (or other pollutants) is higher than threshold • Send alarms when pH is higher/lower than expected • Send alarms when water conductivity is higher/lower than expected • Send measurement's log values at periodic interval • From central application to IoT device <ul style="list-style-type: none"> • Change sampling rates • From IoT device to IoT device <ul style="list-style-type: none"> • Field testing device connected to the IoT network to send tests and calibration commands
Parking sensor	RFD	<ul style="list-style-type: none"> • From IoT device to central application <ul style="list-style-type: none"> • Send parking status each time it changes • Send low-battery alarms • Send magnetic interference alarms • From central application to IoT device <ul style="list-style-type: none"> • Receive calibration and sensitivity commands
Streetlight cabinet controller	FFD	<ul style="list-style-type: none"> • From IoT device to central application <ul style="list-style-type: none"> • Send active power, voltage, current, power factor, cumulated energy and harmonic distortion rate when these values change significantly and/or at fixed interval • Send the above electrical values when the status (open/close) of the mains switches change • Send an event/alarm when digital input status of the cabinet change (e.g. relay status, door open, flood detected) • Send an event/alarm in case cabinet's relays are blocked • From central application to IoT device <ul style="list-style-type: none"> • Read the above electrical values on-demand • Send manual override command to open/close any of the cabinet's relay • Send schedulers to program the days/time when the relays should open/close (e.g. switch ON at sunset+5mns and OFF at sunrise -12 mns) • Read configuration attributes and alarm thresholds • Update configuration attributes and alarm thresholds
Location detection	RFD	<ul style="list-style-type: none"> • From IoT device to central application <ul style="list-style-type: none"> • Send GPS position at periodic interval and/or when it moves and changes by more than X meters • From central application to IoT device

		<ul style="list-style-type: none"> • Read the GPS value on-demand
People counter	FFD	<ul style="list-style-type: none"> • From IoT device to central application <ul style="list-style-type: none"> • Send cumulative number of people detected since the beginning of the day at periodic interval • Send number of people counted during a configurable time period (e.g. last 15 mns, last 1 hour) • From central application to IoT device <ul style="list-style-type: none"> • Read the data provided by the counter • Read the list of MAC Address of Bluetooth or wifi devices detected and counted (applies when counter uses this technology) • Remotely modify the configurable periods of time
Traffic counter	FFD	<ul style="list-style-type: none"> • From IoT device to central application <ul style="list-style-type: none"> • Send cumulative number of vehicles per lane and per vehicle category, since the beginning of the day, at periodic interval • Send number of vehicles detected per lane and per vehicle category during a configurable time period (e.g. last 15 mns, last 1 hour) • Send average distance interval between vehicles during configurable time period • Send min, max and average vehicle speed during configurable time period • From central application to IoT device <ul style="list-style-type: none"> • Read the data provided by the counter • Remotely modify the configurable periods of time
Pedagogic radar	FFD	<ul style="list-style-type: none"> • From IoT device to central application <ul style="list-style-type: none"> • Send cumulative number of vehicles since the beginning of the day, at periodic interval • Send log values with three values of vehicle speed (long before the radar, before the radar and after the radar) at periodic interval • From central application to IoT device <ul style="list-style-type: none"> • Read the data provided by the pedagogic radar
Panic button	RFD	<ul style="list-style-type: none"> • From IoT device to central application <ul style="list-style-type: none"> • Send an alarm when the panic button is pushed • Send an alarm when battery is getting low • Send an “I’m alive” message at periodic time interval
City information panel	FFD	<ul style="list-style-type: none"> • From central application to IoT device <ul style="list-style-type: none"> • Write a text on one city information panel to inform drivers and citizen



		<ul style="list-style-type: none"> • Write a text on several city information panels (multicast) • Remotely configure the display • From IoT device to IoT device <ul style="list-style-type: none"> • Temperature and/or Air quality sensor to send information about temperature, PM1, PM2.5 or PM10 to be displayed on a city information panel • Parking sensors sending information about their availability so that a city information panel displays the number of parking places available and displays green/red color depending on the remaining places
LED color light	FFD	<ul style="list-style-type: none"> • From IoT device to central application <ul style="list-style-type: none"> • Send the actual status and color of the LED light • From central application to IoT device <ul style="list-style-type: none"> • Send a command to change the color of the LED • From IoT device to IoT device <ul style="list-style-type: none"> • Air quality sensor to send information about PM1, PM2.5 or PM10 to be displayed as a color on the LED color light • Parking sensor sending information about its availability so that the LED color light displays availability in green or red

*FFD: Full Feature Device, RFD: Reduced Feature Device (e.g. battery)

3.3. uCIFI communication modes

To support the above use cases, uCIFI shall support both unicast and multicast communication modes:

- Unicast communication
 - Single notification (a.k.a. events) when data (e.g. metering data, event, alarm) is sent by one party to inform the other one (device to cloud, cloud to device, or device to device).
 - Single requests when a service (e.g. a command) is requested from one party to another (e.g. updating configuration parameters, sending schedulers, request to read metering data).
 - Single response is optional and depends on the nature of the request and the specific implementation by the device and/or application supplier.
- Multicast/Broadcast communication
 - Multiple notification to support use cases such as sensors triggering actions in multiple actuators (e.g. dynamic sensor-based follow-me outdoor lighting) or sending information to many devices (e.g. time update).
 - Multiple requests when an application needs to send a command or a query to a group of devices (e.g. lux sensor sending a “switch ON” command to a group of connected outdoor lights). Multicast commands may request unicast answers even if it may not be recommended on some networks.



3.4. uCIFI services

To support the above use cases, the uCIFI device data model shall support the following services:

- **Sending data or commands:** the ability for one party (e.g. an IoT device or a central application) to send events and/or device attribute values (e.g. electrical metering values) and/or commands (e.g. on-demand read request, manual override commands, schedulers, configuration updates) to the other party. Answers or acknowledgement to such data sending is optional and depends on supplier-specific implementation.
- **Resource discovery:** the ability for devices to announce their device data model for other devices or cloud to understand how to interact with it. This applies particularly well for Device-to-Device communication, to ensure device interoperability and interchangeability. For Device-to-Cloud, uCIFI plans to release an online service for central applications to query device data model description based on supplier identifier and device type.
- **Grouping devices** in multicast groups. uCIFI shall also support adding/removing an IoT device to/from a group,
- **Events:** the ability for an IoT device to notify another IoT device or to notify a central application that an event or an alarm occurred, as well as to notify that this even or alarm is over.
- **Schedulers:** the ability to define and send a set of rules (i.e. sensor or time events that trigger actions) to be executed inside the target IoT device (a.k.a. edge computing) and to read the active rule in an IoT device.
- **Time synchronization:** the ability to synchronize the real-time clock in one or more IoT device.

Important: data encryption (e.g. data encryption, security keys) is expected to be covered by the LPWAN network or by LwM2M. Thus, the payload sent by a uCIFI-compliant IoT device may be encrypted in different ways depending on the LPWAN network itself.

Other services such as access rights (e.g. authorization for a central application to interact with an IoT device) and firmware update (a.k.a. Over The Air update or OTA) are expected to be covered either by the underlying LPWAN network and transport mechanisms (e.g. LoRaWAN, NB-IoT), or by LwM2M or by the central application.

4. Principles of the uCIFI device data model

4.1. Leveraging existing standards

To fulfil the scope of work and to support the use cases defined in the previous section, the uCIFI device data model is based on and benefits from the following standards:

- LightweightM2M Version 1.1 (LwM2M), the device management protocol defined by the Open Mobile Alliance, that uCIFI extends with smart city and smart utility specific device types and data exchanges mechanisms.
More about [lightweightM2M here](#).



- IPSO smart objects that uses the LwM2M data types, operations and format to represent some basic sensors. IPSO defines sensors such as digital input/output, analogue input/output, generic sensor, illuminance sensor, presence sensor, temperature sensor, accelerometer, etc. IPSO smart objects do not cover the above-defined use cases. Thus, uCIFI shall re-use IPSO smart object models when possible and define new objects, using IPSO smart objects as a template. The uCIFI device data model is the smart city and smart utility extension of LwM2M and IPSO.
More about [IPSO model here](#).



The uCIFI data model is designed to be easily compatible with the following standard:

- Zhaga D4i, the lighting standard from the Digital Illumination Interface Alliance (DiiA) that extends the DALI-2 protocol to intra-luminaire communication.
More about [Zhaga D4i here](#).



- TALQ, the smart city protocol, lists device features (called “Functions”) and their attributes for outdoor lighting, smart waste, air quality monitoring and few other smart city applications. TALQ is a HTTPS and RESTful protocol that can’t run “on” constrained LPWAN networks such as LoRaWAN, NB-IoT or Wi-SUN but “above” them: between network gateways and central management software. The uCIFI device data model is the ideal complement to the TALQ protocol, but that runs “on” constrained IoT network such as LoRaWAN, NB-IoT and Wi-SUN.
More about [TALQ here](#).



4.2. Positioning

The uCIFI device data model is the smart city and utility extension of IPSO smart object model, that uses the LwM2M protocol. It provides agreed device attributes for every type of IoT devices that are required in smart city and utility use cases.

Positioning versus TALQ

The uCIFI device data model is implemented in the IoT device connected to the LPWAN network. It is supported by constrained networks with small payload. TALQ is implemented both in Network Gateways/Server (called TALQ Gateways) and in Central Management Software.

TALQ is a RESTful protocol and thus can't be implemented in the end-device connected to LPWAN networks.

For the smart streetlight industry, uCIFI is positioned as the standardized missing bridge between Zhaga D4i, the communication inside an outdoor LED luminaire, and TALQ, the protocol for Smart City Central Management Software.

Positioning versus IPSO

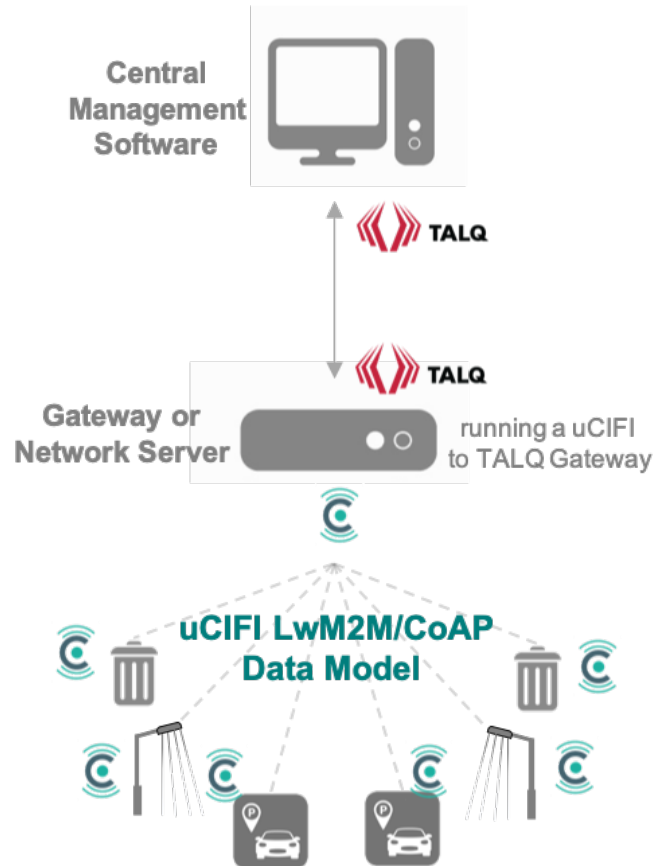
IPSO provides a list of 18 device types (a.k.a. IPSO Smart Object) as part of a starter pack and 33 additional in the IPSO Extension Pack. The IPSO smart objects are simple atomic objects, e.g. digital input, voltage sensor, GPS location, push button, and their attributes. Some of the IPSO smart objects are useful to support the smart city and utility use cases listed in this document. But most of the IoT device types that are required cannot be supported by IPSO smart objects. Thus, uCIFI objects defined in the uCIFI device data model is an extension to the IPSO smart objects to support the smart city and utility market.

Positioning versus LwM2M

The uCIFI device data model is fully compliant with LightweightM2M Version 1.1. LightweightM2M defines a device management protocol but does not define smart city and smart utility device types and associated attributes and services that are required to support the use cases listed in this document. uCIFI leverages and extends LightweightM2M to support smart city and smart utility use cases.

Positioning versus CoAP

The uCIFI device data model uses the CoAP protocol principles to benefit from discovery, multicasting, acknowledging and observing.



4.3. Principles

About Composite Objects

As explained by the OMA IPSO working group, suppliers can define their specific device types as a composition of atomic resources.

“Composite objects offer higher granularity than one large object would. An observer of a device represented as a composite object could reduce bandwidth utilization by observing only the linked object instances instead of the full object.” IPSO Smart Object white paper

As an example, an air quality sensor could be defined as a composite object, based on IPSO resources “3303 – Temperature Sensor”, “3304 – Humidity Sensor”, “3323 – Pressure” and also uCIFI objects such as “3427 - Air Quality sensor” that enables to read values such as PM10, PM2.5, O₃, SO₂ and NO₂.

Definition of uCIFI objects

To fulfil the needs and to support the uCIFI smart city and utility use cases, the uCIFI Alliance defines “objects”, called uCIFI objects. The strategy to define these objects is as follows:

- **Full support by IPSO**
When there is an IPSO smart object that fully supports the uCIFI use case, uCIFI adopts the IPSO smart object. Examples: generic sensor, temperature sensor, humidity sensor.
- **Partial support by IPSO**
When a uCIFI use case cannot be supported by one or a set of IPSO smart object(s), totally or partially, then uCIFI defines a new uCIFI object that fully support the use case. Examples: water meter, water quality sensor, water irrigation valve, outdoor lighting controller, parking place sensor and more.

5. List of uCIFI objects

The table below lists all the uCIFI objects required to support the smart city and utility use cases listed in this document:

Use case	uCIFI object	OMA Identifier	Equivalent IPSO smart object
Generic	Device extension Extension to LwM2M Object ID 3	3410	Object ID: 3
Generic	Battery	3411	No equivalent
Generic	Communication	3412	No equivalent
Generic	Digital input	3200	Object ID: 3200
Generic	Digital output	3201	Object ID: 3201
Generic	Analog input	3202	Object ID: 3202
Generic	Generic sensor	3300	Object ID: 3300
Generic	Generic actuator	3413	Object ID: 3306
Generic	Data bridge	3414	Object ID: 3341
Generic	Time synchronisation	3415	No equivalent
Outdoor Lighting	Outdoor lamp controller	3416	No equivalent
Outdoor Lighting	Luminaire asset	3417	No equivalent
Outdoor Lighting	Electrical monitor	3418	No equivalent
Outdoor Lighting	Photocell	3419	No equivalent
Outdoor Lighting	Lux sensor	3301	Object ID: 3301
Outdoor Lighting	LED color light	3410	No equivalent

Energy	Single-phase electrical meter	3421	Object ID: 10242
Energy	Three-phase electrical meter complement	3422	No equivalent
Energy	Gas meter	3423	No equivalent
Water	Water meter	3424	No equivalent
Water	Irrigation valve	3425	Object ID: 3306
Water	Water quality sensor	3426	No equivalent
Water	Pressure monitoring	3427	No equivalent
Environment	Temperature sensor	3303	Object ID: 3303
Environment	Humidity sensor	3304	Object ID: 3304
Environment	Air quality sensor	3428	No equivalent
Environment	Presence sensor	3302	Object ID: 3302
Environment	Tilt sensor	3429	Object ID: 3313 + 3334
Traffic	Global Navigation Satellite System	3430	No equivalent
Traffic	Parking sensor	3431	No equivalent
Traffic	Traffic counter	3432	No equivalent
Traffic	City information panel	3341	Object ID: 3341
Safety	Panic button	3347	Object ID: 3347
Safety	Noise sensor	3433	Object ID: 3324



Safety	People counter	3434	No equivalent
Safety	LwM2M location	6	N/A
Waste	Filling level sensor	3435	No equivalent



6. uCIFI Generic Objects

6.1. uCIFI Device extension

Description

The uCIFI device extension is an extension to the standard Lightweight M2M device (object ID 3) using the resource called “ExtDevInfo” (resource ID 22).

Object definition

Name	Object ID	Object Version	LWM2M Version
uCIFI Device Extension	3410	1.0	Not yet submitted
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3410		Single	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
1	GTIN model number	R	String	Optional	N/A	Standard global trade-in international number for the control device
2	Manufacturer identifier	R	String	Mandatory	N/A	Unique identifier of the manufacturer of the control device, equivalent to IEEE's OUI (Organizational Unique Identifier). This value should be a Hexadecimal value. This value may be used by an online uCIFI product catalog server, for software modules to retrieve the data model of a device using this attribute associated with the model number on the “Device” (Id=3) object
3	User-given name	RW	String	Optional	N/A	User-readable name of the device set by the user
4	Asset identifier	RW	String	Optional	N/A	Identifier of the asset (e.g. meter, luminaire, container) that is controlled by the device
5	Installation date	RW	String	Optional	Date	Installation date of device
6	Software update	R	Boolean	Optional	N/A	Set to True while software within the device is being updated
7	Maintenance	RW	Boolean	Optional	N/A	Set to True when the device is in maintenance mode



8	Configuration reset	E	N/A	Optional	N/A	Reset the configuration parameters (and only the configuration parameters) of the device. It does not clear any counter (e.g. kWh counter or operating hour counter)
9	Device operating hours	R	Integer	Optional	Hours	Cumulated number of hours during which the device has been powered on
10	Additional firmware information	R	String	Optional	N/A	Additional information about peripheral firmware versions. The format is left to the vendor

The instance for each attribute of this object is “Single”.
Click [here](#) to go back to the list of devices.

6.2. uCIFI Battery

Description

The uCIFI battery object provides attributes to monitor battery level and activity.

Object definition

Name	Object ID	Object Version	LWM2M Version
uCIFI Battery	3411	1.0	Not yet submitted
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3411		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
1	Battery level	R	Integer	Mandatory	%	Level of charge of the battery in % of total possible charge
2	Battery capacity	R	Float	Optional	Ah	Nominal capacity of the battery in Ampere hour
3	Battery voltage	R	Float	Optional	V	Level of charge of the battery in Volts
4	Type of battery	RW	String	Optional	N/A	Describes the type of battery (e.g. Li-Ion rechargeable)
5	Low battery threshold	RW	Integer	Optional	%	Threshold below which an event is generated by the device

6	Battery level too low	R	Boolean	Optional	N/A	Set to True if battery level is below or equal the low battery threshold. Set to False otherwise
7	Battery shutdown	RW	Boolean	Optional	N/A	Indicates that the device has shut down due to battery discharge. Can be reset by central application
8	Number of cycles	R	Integer	Optional	N/A	Number of times the battery has discharged and recharged
9	Supply loss	R	Boolean	Optional	N/A	Applies for battery devices that are also connected to mains supply. Set to True when mains power is lost. Back to 0 when mains power is back
10	Supply loss counter	R	Integer	Optional	N/A	Number of supply losses since last reset
11	Supply loss counter reset	E	N/A	Optional	N/A	Reset the supply loss counter
12	Supply loss reason	R	String	Optional	N/A	Reason identified by the device why the device has lost mains supply (e.g. lightning if the device measured a high voltage, accident if the device identified a move with an accelerometer)

The instance for each attribute of this object is “Single”.
Click [here](#) to go back to the list of devices.

6.3. LPWAN Communication

Description

The uCIFI LPWAN communication object provides attributes related to the communication on the LPWAN network, including multicast grouping.

Object definition

Name	Object ID	Object Version	LWM2M Version
LPWAN Communication	3412	1.0	Not yet submitted
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3412		Multiple	Optional

Resource definition

ID	Name	RWE	Instance	Type	Mandatory or Optional	Unit	Description
1	Type of network	R	Single	String	Optional	N/A	Type of LPWAN communication network (e.g. LoRaWAN, NB-IoT, wireless mesh, power line)
2	IPv4 address	RW	Multiple	String	Optional	N/A	Device's IPv4 address
3	IPv6 address	RW	Multiple	String	Optional	N/A	Device's IPv6 address
4	Network address	RW	Multiple	String	Optional	N/A	Address of the device on the LPWAN network
5	Secondary network address	RW	Multiple	String	Optional	N/A	Secondary address used to communicate with the device on the LPWAN network
6	MAC address	RW	Single	String	Mandatory	N/A	IEEE MAC address of the device
7	Peer address	R	Multiple	String	Optional	N/A	Address of a peer (e.g. a router, a mesh node, a gateway)
8	Multicast group address	RW	Multiple	String	Optional	N/A	Group address from which the device should accept incoming messages and/or commands
9	Multicast group key	RW	Multiple	String	Optional	N/A	Security key (e.g. AES128) to be shared with other members to be part of a multicast group
10	Data rate	RW	Single	Integer	Optional	N/A	Data rate of the communication used on the LPWAN network
11	Transmit power	R	Single	Float	Optional	dBm	Transmit power (also called TxPower) used by the device on the LPWAN network in decibel per milliwatt
12	Frequency	RW	Single	Float	Optional	Hz	Frequency of the wireless communication used on the LPWAN network

13	Session time	RW	Single	Time	Optional	N/A	Starting time of the multicast session. The IoT device shall not accept incoming messages before this time or after this time + session duration
14	Session duration	R	Single	Time	Optional	Seconds	Duration of the multicast session. The device shall accept incoming messages only during this session duration time, starting at Session Time
15	Mesh node	RW	Single	Boolean	Optional	N/A	Set to True if the device is a mesh node that should repeat incoming messages on a mesh network
16	Maximum repeat time	RW	Single	Integer	Optional	N/A	Maximum number of times a message should be repeated within a mesh network
17	Number of repeats	R	Single	Integer	Optional	N/A	Number of mesh nodes between the device and the destination device (e.g. another device or a router) including the destination node, on a mesh network
18	Signal to noise ratio	R	Single	Float	Optional	dB	Ratio of signal power to the noise power
19	Communication failure	R	Single	Boolean	Optional	N/A	Set to True when the device can't communicate properly
20	Received Signal Strength Indication	R	Single	Float	Optional	dBm	Signal strength of the communication network measured by the device (a.k.a. RSSI)
21	IMSI	R	Single	String	Optional	N/A	Device's International Mobile Subscriber Identity
22	IMEI	R	Single	String	Optional	N/A	Device's International Mobile Equipment Identity

23	Current Communication Operator	R	Single	String	Optional	N/A	Device's current communication operator
24	Integrated Circuit Card Identifier	R	Single	String	Optional	N/A	Unique identifier used to identify a communication SIM card

Click [here](#) to go back to the list of devices.

6.4. Digital input

Description

This digital input object is an extended version of the IPSO digital input object can be used with any kind of digital input interface. This digital input is to be used only for non-specific binary sensors which are not covered by another more specific IPSO or uCIFl object.

Object definition

Name	Object ID	Object Version	LWM2M Version
Digital Input	3200	1.0	1.0
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3200		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
5500	Digital input state	R	Boolean	Mandatory	N/A	The current state of the digital input
5501	Digital input counter	R	Integer	Optional	N/A	The cumulative value of active state detected
5502	Digital input polarity	RW	Boolean	Optional	N/A	The polarity of the digital input as a Boolean: 0 = normal, 1 = reversed
5503	Digital input debounce	RW	Integer	Optional	Millisecond	The debounce period in ms
5504	Digital input edge selection	RW	Integer enum: 1 to 3	Optional	N/A	The edge selection as an integer: 1 = Falling edge, 2 = Rising edge, 3 = Both Rising and Falling edge
5505	Digital input counter reset	E	N/A	Optional	N/A	Reset the counter value

5750	Application type	RW	String	Optional	N/A	Application type of the sensor as a string, e.g. CO ₂
5751	Sensor type	R	String	Optional	N/A	Type of sensor (e.g. PIR)
26241	Digital input failure check period	RW	integer	Optional	hours	Duration after which the Digital Input failure is set to "1" when there is no change to the Digital Input.
26242	Digital input failure	R	Boolean	Optional	N/A	Set to True if the sensor is not showing any edges for "Digital Input Failure check period"
26243	Digital input level selection	RW	Integer Enum: 1 to 2	Optional	N/A	Active level selection: 1 = active low (0) , 2 = active high (1)
26244	Digital input selection	RW	Integer Enum: 1 to 3	Optional	N/A	Trigger selection: 1 = edge trigger (5504), 2 =level trigger (26243), 3 = both

The instance for each attribute of this object is "Single".

Click [here](#) to read the object description on the Open Mobile Alliance web site.

Click [here](#) to go back to the list of devices.

6.5. Digital output

Description

This IPSO object is a generic object that can be used with any kind of digital output. This generic digital output is to be used only for non-specific binary actuator which are not covered by another more specific IPSO or uCIFI object.

Object definition

Name	Object ID	Object Version	LWM2M Version
Digital Output	3201	1.0	1.0
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3201		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
5550	Digital Output State	RW	Boolean	Mandatory	N/A	The current state of a digital output

5551	Digital Output Polarity	RW	Integer	Optional	N/A	The polarity of a digital output as a Boolean (0 = Normal, 1= Reversed)
5750	Application Type	RW	String	Optional	N/A	The application type of the output as a string

The instance for each attribute of this object is “Single”.

Click [here](#) to read the object description on the Open Mobile Alliance web site.

Click [here](#) to go back to the list of devices.

6.6. Analog input

Description

This IPSO object is a generic object that can be used with any kind of analog input interface. This generic analog input is to be used only for non-specific analog sensors which are not covered by another more specific uCIFI object.

Object definition

Name	Object ID	Object Version	LWM2M Version
Analog Input	3202	1.0	1.0
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3202		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
5600	Analog Input Current Value	R	Float	Mandatory	N/A	The current value of the analog input
5601	Min Measured Value	R	Float	Optional	N/A	The minimum value measured by the sensor since power ON or reset
5602	Max Measured Value	R	Float	Optional	N/A	The maximum value measured by the sensor since power ON or reset
5603	Min Range Value	R	Float	Optional	N/A	The minimum value that can be measured by the sensor
5604	Max Range Value	R	Float	Optional	N/A	The maximum value that can be measured by the sensor
5750	Application Type	RW	String	Optional	N/A	The application type of the sensor or actuator as a string, e.g. “Air Pressure”



5751	Sensor Type	R	String	Optional	N/A	The type of sensor (e.g. PIR)
5605	Reset Min and Max Measured Values	E	N/A	Optional	N/A	Reset the Min and Max Measured Values to Current Value

The instance for each attribute of this object is “Single”.

Click [here](#) to read the object description on the Open Mobile Alliance web site.

Click [here](#) to go back to the list of devices.

6.7. Generic sensor

Description

This IPSO object allows the description of a generic sensor. It is based on the description of a value and a unit according to the UCUM specification. Thus, any type of value defined within this specification can be reporting using this object.

Specific object for a given range of sensors is described later in the document, enabling to identify the type of sensors directly from its Object ID. This object may be used as a generic object if a specific one does not exist in the list of uCIFI objects.

Object definition

Name	Object ID	Object Version	LWM2M Version
Generic Sensor	3300	1.0	1.0
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3300		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
5700	Sensor value	R	Float	Mandatory	N/A	Last or current measured value from the sensor
5701	Sensor Units	R	String	Optional	N/A	Measurement unit definition as a string
5601	Min Measured Value	R	Float	Optional	N/A	The minimum value measured by the sensor since power ON or reset
5602	Max Measured Value	R	Float	Optional	N/A	The maximum value measured by the sensor since power ON or reset
5603	Min Range Value	R	Float	Optional	N/A	The minimum value that can be measured by the sensor

5604	Max Range Value	R	Float	Optional	N/A	The maximum value that can be measured by the sensor
5750	Application Type	RW	String	Optional	N/A	If present, the application type of the sensor as a string, e.g. CO ₂
5751	Sensor Type	R	String	Optional	N/A	The type of sensor (e.g. PIR)
5605	Reset Min and Max measured values	E	N/A	Optional	N/A	Reset the Min and Max Measured Values to Current Value

The instance for each attribute of this object is “Single”.

Click [here](#) to read the object description on the Open Mobile Alliance web site.

Click [here](#) to go back to the list of devices.

6.8. Generic actuator

Description

The uCIFI generic actuator may be used for any actuator but not to replace Outdoor Lamp Controllers nor for an Irrigation Valves which have a specific device type in the uCIFI data model.

Object definition

Name	Object ID	Object Version	LWM2M Version
Generic actuator	3413	1.0	1.0
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3413		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
1	Default dimming level	RW	Integer	Optional	%	Default dimming level that the generic actuator applies when the device is powered ON
2	Dimming level	R	Integer	Optional	%	Actual dimming level (0 for OFF and 100% for ON) measured on the actuator
3	Command	RW	Integer	Optional	%	Command (e.g. manual override, scheduler) sent to the actuator
4	Command in action	R	Integer	Optional	%	For devices connected on slow LPWAN networks, the command in

						action (this resource) may differ from a command that was sent (resource ID: 3). The command in action is the actual value of the command in action in the actuator
5	Scheduler ID	RW	Integer	Optional	N/A	The identifiers of the schedulers that are assigned to the Command of this actuator. Important : this resource may have multiple instance.
6	Invalid scheduler	R	Boolean	Optional	N/A	Set to True when one of the schedulers can't be executed or is not supported by the actuator. Otherwise equal to 0

The instance for each attribute of this object is "Single", except the resource "Scheduler ID". Click [here](#) to go back to the list of devices.

6.9. Data bridge

Description

The uCIFI data bridge object may be used to transport data from a 3rd party device over a LwM2M compliant network.

Object definition

Name	Object ID	Object Version	LWM2M Version
Data bridge	3414	1.0	Not yet submitted
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3414		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
1	Payload	RW	String	Mandatory	N/A	Content of the message that is to be transported.
2	Hash	RW	String	Optional	N/A	Hash to check the consistency of the data payload.
3	Cumulated daily data volume up	R	Integer	Optional	Bytes	Cumulated volume of data received by the device since beginning of the day. This information could be used for data invoicing.



4	Cumulated daily data volume down	R	Integer	Optional	Bytes	Cumulated volume of data sent by the device since beginning of the day. This information could be used for data invoicing.
5	Cumulated daily data volume total	R	Integer	Optional	Bytes	Cumulated volume of data sent and received by/from the device since beginning of the day. This information could be used for data invoicing.
6	Communication error	R	Boolean	Optional	N/A	Set to True if the device detects a difference in a received payload and the hash.

The instance for each attribute of this object is “Single”.
Click [here](#) to go back to the list of devices.

6.10. Time synchronisation

Description

The uCIFI time synchronization object enables a device to sync-up its internal clock with a remote NTP server.

Object definition

Name	Object ID	Object Version	LWM2M Version
Time synchronization	3415	1.0	Not yet submitted
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3415		Single	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
1	NTP server address	RW	String	Mandatory	N/A	Hostname or IP address of the Network Time Protocol server
2	Backup NTP server address	RW	String	Optional	N/A	Hostname or IP address of a backup NTP server to be used in case the main NTP server does not respond
3	NTP period	RW	String	Optional	N/A	Number of hours before which the device tries to reach the NTP server for time synchronization
4	Last time sync	R	Integer	Optional	Hours	Last time at which a successful time synchronization occurred

5	Time sync error	R	Boolean	Optional	N/A	Set to True in case the latest time synchronization operation failed. Set to False in case the last operation succeeded
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The instance for each attribute of this object is “Single”.
Click [here](#) to go back to the list of devices.

7. uCIFI Smart Streetlight Objects

7.1. Outdoor lamp controller

Description

The uCIFI outdoor lamp controller object provides attributes to control, command and monitor outdoor luminaires in streets, in tunnels, on roads and for illumination of park and gardens.

Object definition

Name	Object ID	Object Version	LWM2M Version
Outdoor lamp controller	3416	1.0	Not yet submitted
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3416		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
1	Command	RW	Integer	Mandatory	%	Command (e.g. manual override, scheduler) sent to the outdoor lamp controller
2	Command in action	R	Integer	Optional	%	For outdoor lighting applications, the command in action (this resource) may differ from a command that was sent (resource ID: 1), due to LPWAN network constraints and/or light adjustments within the lamp’s control gear (e.g. virtual power settings). The command in action is the actual value of the command in action in the outdoor lamp controller
3	Dimming level	R	Integer	Mandatory	%	Dimming level (0 for OFF and 100% for ON) measured on the outdoor lamp controller

4	Default dimming level	RW	Integer	Optional	%	The default dimming level that the outdoor lamp controller applies when the device is powered ON
5	Lamp failure	R	Boolean	Mandatory	N/A	Set to True if the outdoor lamp controller detects that the lamp is not producing light while it is expected to (e.g. the lamp is broken)
6	Lamp failure reason	R	Integer	Optional	N/A	Description of the reason why the lamp failed (e.g. low power on a LED engine, no consumption detected while relay closed)
7	Control gear failure	R	Boolean	Optional	N/A	Set to True in case the control gear has a failure. Outdoor lamp controllers may read the control gear failure from a DALI bus or by analyzing a 0-10 volts interface to the control gear
8	Control gear failure reason	R	Integer	Optional	N/A	Description of the reason why the control gear failed. You may refer to the DiIA list of possible control gear failures
9	Relay failure	R	Boolean	Optional	N/A	Set to True if the outdoor lamp controller detects that its relay is not operating as it is expected to
10	Day burner	R	Boolean	Optional	N/A	Set to True in case the lamp is ON while it should be OFF (e.g. day burner)
11	Cycling failure	R	Boolean	Optional	N/A	Set to True if the outdoor lamp controller detects that the lamp is switching ON and OFF too often
12	Control gear communication failure	R	Boolean	Optional	N/A	Set to True in case the control gear (e.g. LED driver) does not answer on the DALI bus
13	Scheduler ID	RW	Integer	Optional	N/A	Identifier(s) of the scheduler(s) that are assigned to the Command of this outdoor lamp controller. Important: this resource may have multiple instance.
14	Invalid scheduler	R	Boolean	Optional	N/A	Set to True when one of the schedulers can't be executed or is not supported by the outdoor lamp controller. Otherwise equal to 0
15	Lamp operating hours	R	Integer	Optional	Hours	Cumulated number of hours during which the lamp has been ON with a strictly positive dimming level

16	Lamp operating hours reset	E	N/A	Optional	N/A	Reset of the lamp operating hours counter
17	Lamp ON timestamp	R	Time	Optional	N/A	Last date and time at which the lamp switched ON, i.e. from no light to light (e.g. power off to power on and/or dim level = 0 to dim level > 0)
18	Lamp switch counter	R	Integer	Optional	N/A	Number of times the lamp was switched from ON to OFF since the last lamp switch counter reset
19	Lamp switch counter reset	E	N/A	Optional	N/A	Reset the lamp switch counter
20	Control gear start counter	R	Integer	Optional	N/A	Number of times the control gear was switched from ON to OFF
21	Control gear temperature	R	Float	Optional	°C	Temperature measured by the control gear and transmitted to the device through DALI, Zhaga D4i or equivalent
22	Control gear thermal derating	R	Boolean	Optional	N/A	Set to True if the control gear has derated the light source due to high temperature
23	Control gear thermal derating counter	R	Integer	Optional	N/A	Number of times the control gear has derated the light source due to a high temperature, since last counter reset
24	Control gear thermal derating counter reset	E	N/A	Optional	N/A	Reset of the control gear thermal derating counter
25	Control gear thermal shutdown	R	Boolean	Optional	N/A	Set to True if the control gear has shut the light source down due to high temperature
26	Control gear thermal shutdown counter	R	Integer	Optional	N/A	Number of times the control gear has shut the light source down since last counter reset
27	Control gear thermal derating counter reset	E	N/A	Optional	N/A	Reset of the control gear shutdown counter
28	Output port	RW	Integer	Optional	N/A	Address or reference of the output port (e.g. DALI output or 1-10 volt output) in case of multiple control gears

29	Standby mode	RW	Boolean	Optional	N/A	Set to True if the outdoor lamp controller should keep its relay closed (control gear is powered ON) when command and/or dimming level is equal to 0. Set to False if the outdoor lamp controller should open its relay (control gear is not powered ON) when command and/or dimming level is equal to 0
30	Constant light output	RW	Boolean	Optional	N/A	Set to True to activate Constant Light Output dimming correction on the outdoor lamp controller. Set to False to deactivate Constant Light Output
31	Cleaning factor enabled	RW	Boolean	Optional	N/A	Light output of a luminaire may depend on the lamp cleaning factor. Cleaning factor may be used as a light output compensation. Set to True to activate lamp cleaning correction on the outdoor lamp controller. Set to False to deactivate the lamp cleaning correction
32	Cleaning period	RW	Integer	Optional	N/A	Number of days after which cleaning factor is back to 100%
33	Initial lamp cleaning factor	RW	Integer	Optional	%	Initial lamp cleaning correction factor to multiply to the command when the luminaire is cleaned, at the lamp cleaning date
34	Lamp cleaning date	RW	Time	Optional	N/A	Date at which the luminaire was last (or will be next) cleaned and the lamp cleaning factor should be set to the initial lamp cleaning factor
35	Control type	RW	Integer	Optional	N/A	Type of control system with which the outdoor lamp controller switches, dims and monitors the lamp. The possible control types are: 0: No dimming control 1 : DALI part 201 – Device Type 0 2 : DALI part 202 – Device Type 1 3 : DALI part 203 – Device Type 2 4 : DALI part 204 – Device Type 3 5 : DALI part 205 – Device Type 4 6 : DALI part 206 – Device Type 5 7 : DALI part 207 – Device Type 6 8 : DALI part 208 – Device Type 7 9 : DALI part 209 – Device Type 8 10 : 0-10V 11 : PWM

						12 : PWM_N 13 : Other
36	Nominal Lamp wattage	RW	Integer	Optional	Watt	Active power of the light source at 100% dimming level
37	Minimum dimming level	RW	Integer	Optional	%	Minimum dimming level under which the lamp will most probably not operate
38	Minimum lamp wattage	RW	Integer	Optional	Watt	Expected active power of the light source at its minimum dimming level. This value may be used to detect failure at low dimming level
39	Light color temperature command	RW	String	Optional	Kelvin	Latest light color temperature command sent to the lamp actuator
40	Actual light color temperature	R	String	Optional	Kelvin	The actual light color temperature of the light source
41	Virtual power output	RW	Integer	Optional	%	Percentage of nominal power at which the light source should be set when the Command is set to 100%
42	Voltage at max dim level	RW	Float	Optional	Volt	Voltage level on the control port that corresponds to maximum dimming level. This applies only if Control Type = 0-10V
43	Voltage at min dim level	RW	Float	Optional	Volt	Voltage level on the control port that corresponds to minimum dimming level. This applies only if Control Type = 0-10V
44	Light source voltage	R	Float	Optional	Volt	Voltage (usually DC voltage) to the light source or generic load, measured at the output of the control gear
45	Light source current	R	Float	Optional	Amp	Current (usually DC current) delivered by the control gear to the light source or generic load, measured at the output of the control gear
46	Light source active power	R	Float	Optional	Watt	Active power of the light source or generic load, measured at the output of the control gear
47	Light source active energy	R	Float	Optional	kWh	Cumulated active energy consumption of the light source or generic load, measured at the output of the control gear.

The instance for each attribute of this object is “Single”, except the “Scheduler ID”.

Click [here](#) to go back to the list of devices.

7.2. Luminaire asset

Description

The uCIFl luminaire asset is an object that enables outdoor lighting control software to configure outdoor lamp controllers. It also enables outdoor lamp controllers to send Zhaga



D4i or DALI attributes read from the control gears, to centrally managed outdoor lighting control software or asset management systems.

Object definition

Name	Object ID	Object Version	LWM2M Version
Luminaire asset	3417	1.0	Not yet submitted
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3417		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
1	Asset GTIN	R	String	Mandatory	N/A	Global trade-in international number used in the Luminaire Asset controlled by the device
2	Year of manufacture	RW	Integer	Optional	N/A	Year of manufacture of the luminaire
3	Week of manufacture	RW	Integer	Optional	N/A	Week of manufacture of the luminaire
4	Nominal light output	RW	Integer	Optional	Lumen	Nominal light output of the luminaire
5	Light distribution type	RW	Integer	Optional	N/A	Enumeration of possible light distribution type, using the Zhaga D4i enumeration. Please refer to ZD4i standard for more details.
6	Luminaire color	RW	String	Optional	N/A	Painting color of the luminaire
7	Nominal input power	R	Float	Optional	Watts	Nominal input power of the luminaire
8	Power at minimum dim level	R	Float	Optional	Watts	Power at minimum dim level for the luminaire
9	Nominal max AC mains voltage	R	Integer	Optional	Volts	Nominal max AC mains voltage for the luminaire to operate



10	Nominal min AC mains voltage	R	Integer	Optional	Volts	Nominal min AC mains voltage for the luminaire to operate
11	CRI	R	Integer	Optional	N/A	Color rendering index (0 to 100) of the luminaire
12	CCT value	R	Integer	Optional	Kelvin	Color temperature of the luminaire
13	Luminaire identification	R	String	Optional	N/A	Luminaire identification as per DiiA/D4i specification part 251 (MB1 extension): 60 ascii character string
14	Luminaire identification number	R	String	Optional	N/A	Luminaire identification number as per DiiA/D4i specification part 251 (MB1 extension): 20 digit number

The instance for each attribute of this object is “Single”.
Click [here](#) to go back to the list of devices.

7.3. Electrical monitor

Description

The uCIFI electrical monitor object provides attributes related to the analysis of electrical consumption in an outdoor luminaire or in a streetlight cabinet. It also identifies electrical anomalies.

Object definition

Name	Object ID	Object Version	LWM2M Version
Electrical monitor	3418	1.0	Not yet submitted
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3418		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
1	Supply voltage	R	Float	Optional	Volts	Electrical voltage supplied to the device
2	Supply current	R	Float	Optional	Amperes	Electrical current supplied to the device



3	Frequency	R	Float	Optional	Hertz	Frequency of the supply current to the device
4	Active power	R	Float	Optional	Watts	Active power consumed by the device and its electrical load
5	Power factor	R	Float	Optional	N/A	Power factor is equal to active power divided by apparent power. The value is between -1 and +1
6	Cumulated active energy	R	Float	Optional	Wh	Cumulated number of kWh measured by the device and its load since last energy counter reset
7	Energy reset	E	N/A	Optional	N/A	Reset both cumulated active and reactive energy counter
8	Low power factor threshold	RW	Float	Optional	N/A	Threshold below which the device should trigger a low power factor event
9	Low power factor	R	Boolean	Optional	N/A	Set to True if the power factor is below threshold. This is an absolute value threshold
10	Low power threshold	RW	Float	Optional	Watts	Threshold below which the device should trigger a low power event.
11	Low power threshold at low dim level	RW	Float	Optional	Watts	Threshold below which the device should trigger a low power event. This is an addition to the low power threshold to allow a separated threshold when dim level is low.
12	Low power	R	Boolean	Optional	N/A	Set to True if the power is below threshold. Vendor may consider the "Low power threshold at low dim level" to set this resource to 1 taking into account the lamp dim level.
13	High power threshold	RW	Float	Optional	Watts	Threshold above which the device should trigger a high power event

14	High power threshold at low dim level	RW	Float	Optional	Watts	Threshold above which the device should trigger a high power event. This is an addition to the high power threshold to allow a separated threshold when dim level is low
15	High power	R	Boolean	Optional	N/A	Set to True if the power is above threshold. Vendor may consider the “High power threshold at low dim level” to set this resource to 1 taking into account the lamp dim level
16	Low current threshold	RW	Float	Optional	Amperes	Threshold below which the device should trigger a low current event
17	Low current	R	Boolean	Optional	N/A	Set to True if the current is below threshold
18	High current threshold	RW	Float	Optional	Amperes	Threshold above which the device should trigger a high current event
19	High current	R	Boolean	Optional	N/A	Set to True if the current is above threshold
20	Low voltage threshold	RW	Float	Optional	Volts	Threshold below which the device should trigger a low voltage event
21	Low voltage	R	Boolean	Optional	N/A	Set to True if the voltage is below threshold
22	High voltage threshold	RW	Float	Optional	Volts	Threshold above which the device should trigger a high voltage event
23	High voltage	R	Boolean	Optional	N/A	Set to True if the voltage is above threshold
24	Critical inrush current threshold	RW	Float	Optional	Amperes	Threshold above which the device should trigger a critical inrush event
25	Critical inrush current	R	Boolean	Optional	N/A	Set to True if the inrush current is above threshold.
26	Minimum inrush current	R	Float	Optional	Amperes	Minimum inrush current since last configuration

27	Maximum inrush current	R	Float	Optional	Amperes	Maximum inrush current since last configuration
28	Latest inrush current	R	Float	Optional	Amperes	Latest inrush current measured since last time the relay switched ON
29	Reactive power	R	Float	Optional	Var	Instantaneous reactive power measured by the device and its electrical load
30	Reactive energy	R	Float	Optional	varh	Cumulative reactive power measured by the device and its electrical load since last energy counter reset

The instance for each attribute of this object is “Single”.
Click [here](#) to go back to the list of devices.

7.4. Photocell

Description

A uCIFl photocell object is used for lighting control, particularly to identify when light should be switched ON/OFF.

Object definition

Name	Object ID	Object Version	LWM2M Version
Photocell	3419	1.0	Not yet submitted
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3419		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
1	ON lux level	RW	Float	Optional	lx	Lux level below which the photocell switches its relay ON or sends a switch ON message on the network
2	OFF lux level	RW	Float	Optional	lx	Lux level above which the photocell switches its relay OFF or sends a switch OFF message on the network
3	Photocell status	R	Boolean	Optional	N/A	Set to True if lux level is below ON lux level. Set to

						False if lux level is above OFF lux.
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The instance for each attribute of this object is “Single”.

Click [here](#) to go back to the list of devices.

7.5. Illuminance Sensor

Description

The illuminance sensor is a standard IPSO object that provides illuminance in Lux and can be used in lighting control, particularly to remotely control outdoor lamps.

Object definition

Name	Object ID	Object Version	LWM2M Version
Illuminance	3301	1.0	1.0
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3301		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
5700	Sensor value	R	Float	Mandatory	N/A	Last or current measured value from the sensor
5601	Min Measured Value	R	Float	Optional	N/A	The minimum value measured by the sensor since power ON or reset
5602	Max Measured Value	R	Float	Optional	N/A	The maximum value measured by the sensor since power ON or reset
5603	Min Range Value	R	Float	Optional	N/A	The minimum value that can be measured by the sensor
5604	Max Range Value	R	Float	Optional	N/A	The maximum value that can be measured by the sensor
5605	Reset Min and Max measured values	E	N/A	Optional	N/A	Reset the Min and Max Measured Values to Current Value
5701	Sensor Units	R	String	Optional	N/A	Measurement unit definition as a string (i.e. Lux)

The instance for each attribute of this object is “Single”.

Click [here](#) to read the object description on the Open Mobile Alliance web site.



Click [here](#) to go back to the list of devices.

7.6. LED color light

Description

The uCIFI LED color light enables to control light colors of a LED luminaire.

Object definition

Name	Object ID	Object Version	LWM2M Version
LED color light	3420	1.0	1.0
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3420		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
1	RGB value	RW	String	Mandatory	N/A	Text string according to the RBG hexadecimal format with # (e.g. #FF0000 for 100% red)

The instance for each attribute of this object is “Single”.

Click [here](#) to go back to the list of devices.

8. uCIFI Smart Energy Objects

8.1. Single-phase electrical meter

Description

The uCIFI single-phase electrical meter measures the electrical consumption of loads on one electrical line, such as electrical cabinets in city infrastructures, street lighting networks, homes and buildings.

Object definition

Name	Object ID	Object Version	LWM2M Version	TALQ Function
Single-phase electrical meter	3421	1.0	Not yet submitted	None
Object URN			Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3421			Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
1	Voltage	R	Float	Mandatory	V	Instantaneous voltage measured between line and neutral
2	Low voltage threshold	R	Float	Optional	V	Threshold below which the low voltage resource is set to True
3	Low voltage	R	Boolean	Optional	N/A	Set to True when voltage is below low voltage threshold
4	High voltage threshold	R	Float	Optional	V	Threshold above which the high voltage resource is set to True
5	High voltage	R	Boolean	Optional	N/A	Set to True when voltage is above high voltage threshold
6	Current	R	Float	Mandatory	A	Instantaneous current measured
7	Low current threshold	R	Float	Optional	V	Threshold below which the low current resource is set to True
8	Low current	R	Boolean	Optional	N/A	Set to True when current is below low current threshold

9	High current threshold	R	Float	Optional	V	Threshold above which the high current resource is set to True
10	High current	R	Boolean	Optional	N/A	Set to True when current is above high current threshold
11	Frequency	R	Float	Optional	Hz	Instantaneous frequency measured
12	Angle of I-U	R	Float	Optional	deg	Instantaneous phase angle measured
13	Instantaneous Power Factor	R	Float	Mandatory	N/A	Instantaneous power factor overall
14	Low power factor threshold	R	Float	Optional	N/A	Threshold below which the low power factor resource is set to True
15	Low power factor	R	Boolean	Optional	N/A	Set to True when power factor is below low power factor threshold
16	Active power+ (QI+QIV)	R	Float	Mandatory	W	Active power import
17	Active power- (QII+QIII)	R	Float	Optional	W	Active power export
18	Reactive power+ (QI+QII)	R	Float	Optional	var	Reactive power import
19	Reactive power- (QIII+QIV)	R	Float	Optional	var	Reactive power export
20	Instantaneous Apparent Power import (+VA)	R	Float	Optional	VA	Instantaneous apparent power import
21	Instantaneous Apparent Power export (-VA)	R	Float	Optional	VA	Instantaneous apparent power export
22	Instantaneous Active Power (+A + -A)	R	Float	Optional	W	Instantaneous active power
23	Instantaneous Net Active	R	Float	Optional	W	Instantaneous net active power

	Power (+A - -A)					
24	Measurement period of Instantaneous value	R	Float	Optional	Seconds	Measurement period of instantaneous value
25	Active energy import (+A) Un	R	Float	Mandatory	Wh	Active energy import (unified rate)
26	Active energy export (-A) Un	R	Float	Optional	Wh	Active energy export (unified rate)
27	Active energy (+A + -A) Combined total	R	Float	Optional	Wh	Active energy (+A + -A) Combined total
28	Active energy (+A - -A) Combined total	R	Float	Optional	Wh	Active energy (+A - -A) Combined total
29	Reactive energy import (+R) Un	R	Float	Optional	varh	Reactive energy import (unified rate)
30	Reactive energy export (-R) Un	R	Float	Optional	varh	Reactive energy export (unified rate)
31	Reactive energy QI (+Ri) Un	R	Float	Optional	varh	Reactive energy QI (+Ri) (unified rate)
32	Reactive energy QII (+Rc) Un	R	Float	Optional	varh	Reactive energy QII (+Rc) (unified rate)
33	Reactive energy QIII (-Ri) Un	R	Float	Optional	varh	Reactive energy QIII (-Ri) (unified rate)
34	Reactive energy QIV (-Rc) Un	R	Float	Optional	varh	Reactive energy QIV (-Rc) (unified rate)
35	Apparent energy import Un	R	Float	Optional	VAh	Apparent energy import (unified rate)
36	Apparent energy export Un	R	Float	Optional	VAh	Apparent energy export (unified rate)
37	Number of power failures	R	Float	Optional	N/A	Number of power failures



38	Number of long power failures	R	Float	Optional	N/A	Number of long power failures
39	Time threshold for long power failure	RW	Float	Optional	Seconds	Time threshold for long power failure
40	Duration of last long power failure	R	Float	Optional	Seconds	Duration of last long power failure
41	Threshold for voltage sag	RW	Float	Optional	V	Threshold for voltage sag
42	Time threshold for voltage sag	RW	Float	Optional	Seconds	Time threshold for voltage sag
43	Number of voltage sags	R	Float	Optional	N/A	Number of voltage sags
44	Duration of last voltage sag	R	Float	Optional	Seconds	Duration of last voltage sag
45	Magnitude of last voltage sag	R	Float	Optional	V	Magnitude of last voltage sag
46	Threshold for voltage swell	RW	Float	Optional	V	Threshold for voltage sag
47	Time threshold for voltage swell	RW	Float	Optional	Seconds	Time threshold for voltage sag
48	Number of voltage swells	R	Float	Optional	N/A	Number of voltage sags
49	Duration of last voltage swell	R	Float	Optional	Seconds	Duration of last voltage sag
50	Magnitude of last voltage swell	R	Float	Optional	V	Magnitude of last voltage swell
51	Threshold for missing voltage (voltage cut)	RW	Float	Optional	V	Threshold for missing voltage (voltage cut)
52	Time threshold for voltage cut	RW	Float	Optional	Seconds	Time threshold for voltage cut
53	Voltage cut	R	Boolean	Optional	N/A	Set to True if a voltage cut for a time above the time threshold and for a voltage

						below the voltage threshold is detected
54	CT Numerator Parameter	RW	Float	Optional	N/A	Transformer ratio – current (numerator)
55	CT Denominator Parameter	RW	Float	Optional	N/A	Transformer ratio – voltage (denominator)
56	VT Numerator Parameter	RW	Float	Optional	N/A	Transformer ratio – current (numerator)
57	VT Denominator Parameter	RW	Float	Optional	N/A	Transformer ratio – voltage (denominator)

The instance for each attribute of this object is “Single”.
Click [here](#) to go back to the list of devices.

8.2. Three-phase electrical meter complement

Description

The uCIFI three-phase electrical meter complement gathers all the measures, events, threshold and other resources required to create a full three-phase electrical meter together with three additional uCIFI single-phase electrical meters.

Object definition

Name	Object ID	Object Version	LWM2M Version	Exist in TALQ
Three-phase electrical meter complement	3422	1.0	Not yet submitted	3-phase electrical meter
Object URN			Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3422			Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
1	Not yet public					
2	Not yet public					
3	Not yet public					



...						
33	Not yet public					
34	Not yet public					
35	Not yet public					

The instance for each attribute of this object is "Single".

Click [here](#) to go back to the list of devices.

8.3. Gas meter

Description

The uCIFI gas meter measures the volume of gas that was distributed through the gas meter, in pulse count and/or in m³. It also detects anomalies in the gas meter.

Object definition

Name	Object ID	Object Version	LWM2M Version
Gas meter	3423	1.0	Not yet submitted
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3423		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
1	Cumulated gas volume	R	Float	Mandatory	Cubic meter	Number of cubic meters of gas distributed through the meter since last reset
2	Cumulated gas meter value reset	E	N/A	Optional	N/A	Reset the cumulated meter value
3	Type of Meter	RW	String	Optional	N/A	Type of gas meter
4	Cumulated pulse value	R	Integer	Mandatory	N/A	Cumulated number of pulses detected on the meter since last reset
5	Cumulated pulse value reset	E	N/A	Optional	N/A	Reset the cumulated pulse value
6	Pulse ratio	RW	Integer	Optional	N/A	Ratio to calculate gas volume from pulse value
7	Minimum flow rate	R	Float	Optional	m ³ /s	Minimum flow rate since last metering value
8	Maximum flow rate	R	Float	Optional	m ³ /s	Maximum flow rate since last metering value
9	Leak suspected	R	Boolean	Optional	N/A	Set to True if gas leak is suspected
10	Leak detected	R	Boolean	Optional	N/A	Set to True if gas leak is detected



11	High temperature	R	Boolean	Optional	N/A	Set to True if high temperature is detected around the gas meter
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The instance for each attribute of this object is "Single".

Click [here](#) to go back to the list of devices.

9. uCIFI Smart Water Objects

9.1. Water meter

Description

The uCIFI water meter measures water volume that was distributed through a water meter, in pulse count as well as in m³. It also detects anomalies in the water meter.

Object definition

Name	Object ID	Object Version	LWM2M Version
Water meter	3424	1.0	Not yet submitted
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3424		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
1	Cumulated water volume	R	Float	Mandatory	Cubic meter	Number of cubic meters of water distributed through the meter since last reset
2	Cumulated water meter value reset	E	N/A	Optional	N/A	Reset the cumulated meter value
3	Type of Meter	RW	String	Optional	N/A	Type of water meter
4	Cumulated pulse value	R	Integer	Optional	N/A	Cumulated number of pulses detected on the water meter
5	Cumulated pulse value reset	E	N/A	Optional	N/A	Reset the cumulated pulse value
6	Pulse ratio	RW	Integer	Optional	N/A	Ratio to calculate water volume from pulse value
7	Minimum flow rate	R	Float	Optional	m ³ /s	Minimum flow rate since last metering value
8	Maximum flow rate	R	Float	Optional	m ³ /s	Maximum flow rate since last metering value
9	Leak suspected	R	Boolean	Optional	N/A	Set to True if water leak is suspected

10	Leak detected	R	Boolean	Optional	N/A	Set to True if water leak is detected
11	Back flow detected	R	Boolean	Optional	N/A	Set to True if water back flow is detected
12	Blocked meter	R	Boolean	Optional	N/A	Set to True if water meter is blocked
13	Fraud detected	R	Boolean	Optional	N/A	Set to True if fraud is detected

The instance for each attribute of this object is “Single”.
Click [here](#) to go back to the list of devices.

9.2. Irrigation valve

Description

The uCIFI irrigation valve provides a way to control and monitor an irrigation valve.

Object definition

Name	Object ID	Object Version	LWM2M Version
Irrigation Valve	3425	1.0	1.0
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3425		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
1	Default status	RW	Integer	Optional	%	Default status (level of opening of the valve from 0 to 100%) that is applied when the device is powered ON
2	Status	R	Integer	Optional	%	Actual level of opening of the valve (from 0 to 100%)
3	Command	RW	Integer	Optional	%	Command (e.g. manual override, scheduler) sent to the irrigation valve
4	Command in action	R	Integer	Optional	%	For devices connected on slow LPWAN networks, the command in action (this resource) may differ from a command that was sent (resource ID: 3). The command in action is the actual value of the

						command in action on the irrigation valve
5	Scheduler ID	RW	Integer	Optional	N/A	Identifiers of the schedulers that are assigned to the Command of this irrigation valve Important : this resource may have multiple instance.
6	Invalid scheduler	R	Boolean	Optional	N/A	Set to True when one of the schedulers can't be executed or is not supported by this irrigation valve. Otherwise equal to 0

The instance for each attribute of this object is “Single”, except the resource “Scheduler ID”. Click [here](#) to go back to the list of devices.

9.3. Water quality sensor

Description

The uCIFl water quality sensor measures the quality of the water in the drinkable water distribution network, in water tanks or in lakes and rivers.

Object definition

Name	Object ID	Object Version	LWM2M Version
Water quality sensor	3426	1.0	Not yet submitted
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3426		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
1	pH	R	Float	Optional	N/A	Current or last value of the pH measured by the sensor
2	Chlorine	R	Float	Optional	ppm	Current or last value of the chlorine measured by the sensor
3	Redox or ORP	R	Float	Optional	Volts	Current or last value of the oxidation reduction potential measured by the sensor



4	Total dissolved gas or TDG	R	Float	Optional	ppm	Current or last value of the dissolved gas measured by the sensor
5	Dissolved oxygen	R	Float	Optional	ppm	Current or last value of the dissolved oxygen measured by the sensor
6	Turbidity	R	Float	Optional	NTU	Current or last value of the turbidity measured by the sensor using the Nephelometric Turbidity Unit (NTU)
7	Conductivity	R	Float	Optional	Siemens/m	Current or last value of the conductivity measured by the sensor
8	Conductance	R	Float	Optional	Siemens/m	Current or last value of the conductance measured by the sensor
9	Total suspended solids	R	Float	Optional	mg/liter	Current or last value of the TSS measured by the sensor
10	Total dissolved solids	R	Float	Optional	mg/liter	Current or last value of the TDS measured by the sensor
11	Salinity	R	Float	Optional	ppt	Current or last value of the salinity measured by the sensor
12	NO3	R	Float	Optional	mg/liter	Current or last value of NO3 measured by the sensor
13	NH3	R	Float	Optional	mg/liter	Current or last value of NH3 measured by the sensor
14	NH4	R	Float	Optional	mg/liter	Current or last value of NH4 measured by the sensor

The instance for each attribute of this object is “Single”.
Click [here](#) to go back to the list of devices.

9.4. Water pressure monitoring

Description

The uCIFI water pressure monitoring sensor measures water pressure and help identify water leaks in water distribution pipelines.

Object definition

Name	Object ID	Object Version	LWM2M Version
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Pressure monitoring sensor	3427	1.0	Not yet submitted
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3427		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
1	Pressure	R	Float	Mandatory	Pascal	Last or current pressure value measured by the sensor
2	Sampling period	RW	Integer	Optional	Seconds	Number of seconds between two measurement
3	Leak detected	R	Boolean	Optional	N/A	Set to True if a water leak is detected by the sensor
4	Hammer effect detected	R	Boolean	Optional	N/A	Set to True if hammer effect is detected in the water pipeline
5	Minimum measured pressure value	R	Float	Optional	Pascal	Minimum value measured by the sensor since power ON or reset
6	Maximum measured pressure value	R	Float	Optional	Pascal	Maximum value measured by the sensor since power ON or reset
7	Minimum range pressure value	R	Float	Optional	Pascal	Minimum value that can be measured by the sensor
8	Maximum range pressure value	R	Float	Optional	Pascal	Maximum value that can be measured by the sensor
9	Reset min and max measured pressure values	E	N/A	Optional	N/A	Set the minimum and maximum measured values to current value

The instance for each attribute of this object is “Single”.

Click [here](#) to go back to the list of devices.

10. uCIFI Environment Monitoring Objects

10.1. Temperature sensor

Description

A temperature sensor reports a temperature measurement. It also provides resources for minimum/maximum measured values and the minimum/maximum range that can be measured by the temperature sensor.

Object definition

Name	Object ID	Object Version	LWM2M Version
Temperature	3303	1.0	1.0
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3303		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
5700	Sensor value	R	Float	Mandatory	N/A	Last or current measured value from the sensor
5601	Min Measured Value	R	Float	Optional	N/A	The minimum value measured by the sensor since power ON or reset
5602	Max Measured Value	R	Float	Optional	N/A	The maximum value measured by the sensor since power ON or reset
5603	Min Range Value	R	Float	Optional	N/A	The minimum value that can be measured by the sensor
5604	Max Range Value	R	Float	Optional	N/A	The maximum value that can be measured by the sensor
5701	Sensor Units	R	String	Optional	N/A	Measurement unit definition as a string. E.g. °C
5605	Reset Min and Max measured values	E	N/A	Optional	N/A	Reset the Min and Max Measured Values to Current Value

The instance for each attribute of this object is “Single”.

Click [here](#) to read the object description on the Open Mobile Alliance web site.

Click [here](#) to go back to the list of devices.

10.2. Humidity sensor

Description

A humidity sensor reports a humidity measurement. It also provides resources for minimum/maximum measured values and the minimum/maximum range that can be measured by the humidity sensor.

Object definition

Name	Object ID	Object Version	LWM2M Version
Humidity	3304	1.0	1.0
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3304		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
5700	Sensor value	R	Float	Mandatory	N/A	Last or current measured value from the sensor
5601	Min Measured Value	R	Float	Optional	N/A	The minimum value measured by the sensor since power ON or reset
5602	Max Measured Value	R	Float	Optional	N/A	The maximum value measured by the sensor since power ON or reset
5603	Min Range Value	R	Float	Optional	N/A	The minimum value that can be measured by the sensor
5604	Max Range Value	R	Float	Optional	N/A	The maximum value that can be measured by the sensor
5701	Sensor Units	R	String	Optional	N/A	Measurement unit definition as a string. E.g. %
5605	Reset Min and Max measured values	E	N/A	Optional	N/A	Reset the Min and Max Measured Values to Current Value

The instance for each attribute of this object is “Single”.

Click [here](#) to read the object description on the Open Mobile Alliance web site.

Click [here](#) to go back to the list of devices.

10.3. Air quality sensor

Description

The uCIFI air quality sensor reports measurement required to calculate Air Quality Index (AQI). It also provides resources for average calculation as per the IQ index calculation.

Object definition

Name	Object ID	Object Version	LWM2M Version
Air quality	3428	1.0	Not yet submitted
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3428		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
1	PM10	R	Float	Optional	ug/m3	Level of PM10 measured by the air quality sensor
2	PM10 24 hour average	R	Float	Optional	ug/m3	Average level of PM10 measured by the sensor during the last 24 hours
3	PM2.5	R	Float	Optional	ug/m3	Level of PM2.5 measured by the air quality sensor
4	PM2.5 24 hour average	R	Float	Optional	ug/m3	Average level of PM2.5 measured by the sensor during the last 24 hours
5	PM1	R	Float	Optional	ug/m3	Level of PM1 measured by the air quality sensor
6	PM1 24 hour average	R	Float	Optional	ug/m3	Average level of PM1 measured by the sensor during the last 24 hours
7	CO	R	Float	Optional	ppm	Level of carbon monoxide measured by the air quality sensor
8	CO 8 hour average	R	Float	Optional	ppm	Average level of carbon monoxide measured by the sensor during the last 8 hours
9	SO2	R	Float	Optional	ppb	Level of sulfur dioxide measured by the air quality sensor

10	SO2 1 hour average	R	Float	Optional	ppb	Average level of sulfur dioxide measured by the sensor during the last 1 hour
11	SO2 24 hour average	R	Float	Optional	ppb	Average level of sulfur dioxide measured by the sensor during the last 24 hours
12	O3	R	Float	Optional	ppb	Level of ozone measured by the air quality sensor
13	O3 1 hour average	R	Float	Optional	ppb	Average level of ozone measured by the sensor during the last 1 hour
14	O3 8 hour average	R	Float	Optional	ppb	Average level of ozone measured by the sensor during the last 8 hours
15	NO2	R	Float	Optional	ppb	Level of nitrogen dioxide measured by the air quality sensor
16	NO2 1 hour average	R	Float	Optional	ppb	Average level of nitrogen dioxide measured by the sensor during the last 1 hour
17	CO2	R	Float	Optional	ppm	Level of carbon dioxide measured by the air quality sensor
18	CO2 1 hour average	R	Float	Optional	ppm	Average level of carbon dioxide measured by the sensor during the last 1 hour
19	NO	R	Float	Optional	ppm	Level of nitric oxide measured by the air quality sensor
20	NO 1 hour average	R	Float	Optional	ppm	Average level of nitric oxide measured by the sensor during the last 1 hour
21	H2S	R	Float	Optional	ppm	Level of hydrogen sulfide measured by the air quality sensor
22	H2S 1 hour average	R	Float	Optional	ppm	Average level of hydrogen sulfide measured by the sensor during the last 1 hour

The instance for each attribute of this object is “Single”.
Click [here](#) to go back to the list of devices.

10.4. Presence sensor

Description

Presence sensor with digital sensing and optional delay parameters.

Object definition

Name	Object ID	Object Version	LWM2M Version
Presence	3302	1.0	1.0
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3302		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
5500	Digital Input State	R	Boolean	Mandatory	N/A	The current state of the presence sensor
5501	Digital Input Counter	R	Integer	Optional	N/A	The cumulative value of active state detected
5505	Digital Input Counter Reset	E	N/A	Optional	N/A	Reset the counter value
5751	Sensor Type	R	String	Optional	N/A	The type of sensor (e.g. PIR)
5903	Busy to Clear delay	RW	Integer	Optional	Millisecond	Delay from the detection state to the clear state in ms
5904	Clear to Busy delay	RW	Integer	Optional	Millisecond	Delay from the clear state to detection state in ms

The instance for each attribute of this object is “Single”.

Click [here](#) to read the object description on the Open Mobile Alliance web site.

Click [here](#) to go back to the list of devices.

10.5. Tilt sensor

Description

The uCIFI tilt sensor provides the angle between the object’s internal vertical and the perpendicular to the earth.

Object definition

Name	Object ID	Object Version	LWM2M Version
Tilt sensor	3429	1.0	Not yet submitted



Object URN	Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3429	Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
1	Angle	R	Float	Mandatory	Radian	Angle between the internal vertical line and the perpendicular to earth
2	Minimum measured Angle	R	Float	Optional	Radian	Minimum angle measured by the tilt sensor since last reset or since power ON if no reset
3	Maximum measured angle	R	Float	Optional	Radian	Maximum angle measured by the tilt sensor since last reset or since power ON if no reset
4	Reset min max angles	E	N/A	Optional	N/A	Set the minimum and maximum measured angles to the current angle value
5	Out of position threshold	RW	Float	Optional	Radian	The angle above which the device triggers an out of position event
6	Out of position	R	Boolean	Optional	N/A	Set to True if the angle is above the out of position threshold

The instance for each attribute of this object is “Single”.
Click [here](#) to go back to the list of devices.

11. uCIFI Smart Mobility Objects

11.1. Global Navigation Satellite System

Description

More than a positioning object, the uCIFI global navigation satellite system object provides all the information required to calculate a position/location.

Object definition

Name	Object ID	Object Version	LWM2M Version
Global Navigation Satellite System	3430	1.0	Not yet submitted
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3430		Single	Optional

Resource definition

ID	Name	RWE	Instances	Mandatory or Optional	Type	Unit	Description
0	Fix timestamp	R	Single	Mandatory	Time	S	Timestamp of when the location measurement was performed
1	Latitude	R	Single	Mandatory	Float	Lat	Decimal notation of latitude, e.g. -43.5723 [World Geodetic System 1984]. This value ranges from [-90, 90]
2	Longitude	R	Single	Mandatory	Float	Lon	Decimal notation of longitude, e.g. 153.21760 [World Geodetic System 1984]. This value ranges from [-180, 180]
3	Altitude	R	Single	Optional	Float	Meter	Altitude above mean sea level in meters
4	Speed	R	Single	Optional	Float	m/s	Horizontal speed calculated by the device
5	Heading	R	Single	Optional	Float	Deg	Direction that the device is following
6	Radius	R	Single	Optional	Float	Meter	Radius of a circular area corresponding to the location's uncertainty (GPS data precision). Negative values indicate that the radius is not available

7	HDOP	R	Single	Optional	Float	N/A	Horizontal dilution of precision
8	VDOP	R	Single	Optional	Float	N/A	Vertical dilution of precision
9	Estimated horizontal accuracy	R	Single	Optional	Float	Meter	Estimated horizontal accuracy
10	Estimated vertical accuracy	R	Single	Optional	Float	Meter	Estimated vertical accuracy
11	Estimated speed accuracy	R	Single	Optional	Float	m/s	Estimated speed accuracy
12	Estimated heading accuracy	R	Single	Optional	Float	Deg	Estimated heading accuracy
13	Fix type	R	Single	Optional	Integer	N/A	Possible values are: 0 = No fix 1 = Autonomous GNSS fix 2 = Differential GNSS fix 3 = GPS PPS 4 = RTK-fixed 5 = RTK-floated 6 = Estimated fix 7 = Dead reckoning fix 8 = Manual input, surveyed 9 = Simulated mode
14	Fix dimension	R	Single	Optional	Integer	N/A	Possible values are: 0,1 = no fix 2 = 2D fix 3 = 3D fix As per NMEA-0183 GSA
15	Used satellites	R	Single	Optional	Integer	N/A	Number of satellites used for the fix
16	Visible satellites	R	Single	Optional	Integer	N/A	Number of satellites viewed. Represent all the satellites seen but some of them cannot be in use (e.g. bad signal).
17	Satellite identifier	R	Multiple	Optional	String	N/A	Identifier of the satellite
18	Satellite elevation	R	Multiple	Optional	Float	Deg	Elevation of the satellite
19	Satellite azimuth	R	Multiple	Optional	Float	Deg	Azimuth of the satellite
20	Almanac	R	Single	Optional	Boolean	N/A	Validity of the almanac. Possible values are: 0 = invalid 1 = valid
21	Ephemeris	R	Multiple	Optional	Boolean	N/A	Validity of the ephemeris of each satellite. Possible values are: 0 = invalid 1 = valid

22	Signal-to-noise ratio	R	Multiple	Optional	Float	N/A	Strength of the signal for each satellite, also called carrier-to-noise
23	GNSS	R	Single	Optional	Integer	N/A	GNSS used for the fix. A mask is used with the following bit definition: 0 = GPS (USA) 1 = GALILEO (EU) 2 = GLONASS (Russia) 3 = BeiDou (China) 4 = QZSS (Japan) 5 = IRNSS/NAVIC (India) A 0 indicates that the GNSS is not used a 1 indicates it is used
24	Hardware RTC	R	Single	Optional	Time	S	Time of the internal clock of the GNSS hardware
25	Assisted GPS	RW	Single	Optional	Boolean	N/A	Set to True if the almanac is obtained via a cellular connection. Set to False otherwise
26	Power command	RW	Single	Optional	Boolean	N/A	Command to switch the hardware ON or OFF and status of the device
27	PDOP	R	Single	Optional	Float	N/A	Dilution of precision (NMEA-0183 GSA)
28	Status	R	Single	Mandatory	String	N/A	Status A=active or V=Void (NMEA-0183 RMC)

The instance for each attribute of this object is “Single”.
Click [here](#) to go back to the list of devices.

11.2. Parking sensor

Description

The uCIFl parking sensor provides actual and cumulated occupancy duration as well as forbidden parking detection.

Object definition

Name	Object ID	Object Version	LWM2M Version
Parking Sensor	3431	1.0	Not yet submitted
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3431		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
1	Occupancy	R	Boolean	Mandatory	N/A	Set to True if the parking place is occupied. Set to False if the parking place is free
2	Duration	R	Integer	Optional	Seconds	Number of seconds since the parking place is occupied. If not occupied, duration shows the duration of the last occupation
3	Daily Duration	R	Integer	Optional	Seconds	Cumulated occupation time since beginning of the day
4	Forbidden parking detected	R	Boolean	Optional	N/A	Set to True if the vehicle present on the parking place is not authorized. Set to False if parking place is free or if the vehicle is authorized
5	Type of sensor	RW	String	Optional	N/A	Type of sensor (e.g. PIR, camera)

The instance for each attribute of this object is "Single".
 Click [here](#) to go back to the list of devices.

11.3. Traffic counter

Description

The uCIFI traffic counter provides vehicle counting and traffic analysis data. A traffic counting device may implement multiple instances of this traffic counter object, each of them being in charge of counting different categories of vehicles (e.g. bikes, cars, trucks).

Object definition

Name	Object ID	Object Version	LWM2M Version
Traffic Counter	3432	1.0	Not yet submitted
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3432		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
1	Cumulated number	R	Integer	Optional	N/A	Cumulated number of vehicles counted since last reset
2	Reset cumulated number	E	N/A	Optional	N/A	Reset the cumulated number of vehicles
3	Cumulated number today	R	Integer	Mandatory	N/A	Cumulated number of vehicles counted today
4	Measuring period 1	RW	Integer	Optional	Seconds	Time period 1 during which the counter shall provide number of vehicles (e.g. 1 hour)
5	Measuring period 2	RW	Integer	Optional	Seconds	Time period 2 during which the counter shall provide number of vehicles (e.g. 15 mns)
6	Measuring period 3	RW	Integer	Optional	Seconds	Time period 3 during which the counter shall provide number of vehicles (e.g. 5 mns)
7	Cumulated number during last period 1	R	Integer	Optional	N/A	Cumulated number of vehicles counted during the last period 1 (e.g. 1 hour)
8	Cumulated number during last period 2	R	Integer	Optional	N/A	Cumulated number of vehicles counted during the last period 2 (e.g. 15 minutes)
9	Cumulated number during last period 3	R	Integer	Optional	N/A	Cumulated number of vehicles counted during the last period 3 (e.g. 5 minutes)

10	Average speed during last period 1	R	Integer	Optional	N/A	Average speed measured on the vehicles during the last period 1 (e.g. 60 minutes)
11	Average speed during last period 2	R	Integer	Optional	N/A	Average speed measured on the vehicles during the last period 2 (e.g. 15 minutes)
12	Average speed during last period 3	R	Integer	Optional	N/A	Average speed measured on the vehicles during the last period 3 (e.g. 5 minutes)
13	Average distance during the last period 1	R	Integer	Optional	N/A	Average distance between two vehicles measured during the last period 1 (e.g. 60 minutes)
14	Average distance during last period 2	R	Integer	Optional	N/A	Average distance between two vehicles measured during the last period 2 (e.g. 15 minutes)
15	Average distance during last period 3	R	Integer	Optional	N/A	Average distance between two vehicles measured during the last period 3 (e.g. 5 minutes)
16	Speed limit threshold	RW	Integer	Optional	N/A	Speed limit configuration attribute
17	Percentage above speed limit	R	Integer	Optional	N/A	Percentage of vehicles driving above speed limit

The instance for each attribute of this object is “Single”.
 Click [here](#) to go back to the list of devices.

11.4. City information panel

Description

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

Object definition

Name	Object ID	Object Version	LWM2M Version
City Information Panel	3341	1.0	1.0

Object URN	Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3341	Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
5527	Text	RW	String	Mandatory	N/A	A string of text.
5528	X Coordinate	RW	Integer	Optional	N/A	X coordinate.
5529	Y Coordinate	RW	Integer	Optional	N/A	Y coordinate.
5545	Max X Coordinate	R	Integer	Optional	N/A	The highest X coordinate the display supports before wrapping to the next line.
5546	Max Y Coordinate	R	Integer	Optional	N/A	The highest Y coordinate the display supports before wrapping to the next line.
5530	Clear display	E	N/A	Optional	N/A	Command to clear the display.
5548	Level	RW	Float	Optional	%	Brightness control, integer value between 0 and 100 as a percentage.
5531	Contrast	RW	Float	Optional	%	Proportional control, integer value between 0 and 100 as a percentage.
5750	Application Type	RW	String	Optional	N/A	The application type of the sensor or actuator as a string depending on the use case.

The instance for each attribute of this object is “Single”.

Click [here](#) to go back to the list of devices.

12. uCIFI Safety Objects

12.1. Panic button

Description

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

Object definition

Name	Object ID	Object Version	LWM2M Version
Panic button	3347	1.0	1.0
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3347		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
5500	Digital Input	R	Boolean	Optional	N/A	The current state of the panic button
5501	Digital Input Counter	R	Integer	Optional	N/A	The number of times the input transitions from 0 to 1
5750	Application type	RW	String	Optional	N/A	The application type of the sensor or actuator as a string depending on the use case

The instance for each attribute of this object is “Single”.

Click [here](#) to go back to the list of devices.

12.2. Noise sensor

Description

The uCIFI noise sensor reports a noise measurement in decibel. It also provides resources for minimum/maximum measured values and the minimum/maximum range that can be measured by the noise sensor and some specific alarms resulting from noise analysis by the device.

Object definition

Name	Object ID	Object Version	LWM2M Version
Noise sensor	3433	1.0	1.0



Object URN	Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3433	Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
1	Gunshot detected	R	Boolean	Optional	N/A	Set to True when a gunshot is detected
2	Abnormal noise detected	R	Boolean	Optional	N/A	Set to True when an abnormal noise is detected
3	Sensor value	R	Float	Mandatory	Decibel	Last or current measured value from the sensor
4	Minimum measured value	R	Float	Optional	Decibel	Minimum value measured by the sensor since power ON or reset
5	Maximum measured value	R	Float	Optional	Decibel	Maximum value measured by the sensor since power ON or reset
6	Minimum range value	R	Float	Optional	Decibel	Minimum value that can be measured by the sensor
7	Maximum range value	R	Float	Optional	Decibel	Maximum value that can be measured by the sensor
8	Reset min and max values	E	N/A	Optional	N/A	Reset the min and max measured values to current value

The instance for each attribute of this object is “Single”.
Click [here](#) to go back to the list of devices.

12.3. People counter

Description

The uCIFI people counter provides people counting information using Bluetooth beacon or any other method.

Object definition

Name	Object ID	Object Version	LWM2M Version
People counter	3434	1.0	Not yet submitted
Object URN		Instances	Mandatory or Optional

urn:oma:lwm2m:ext:3434	Multiple	Optional
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Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
1	Actual number of persons	R	Integer	Mandatory	N/A	Number of persons currently identified by the device
2	Daily number of persons	R	Integer	Optional	N/A	Cumulated number of persons detected by the device since beginning of the day
3	Cumulated number of persons	R	Integer	Optional	N/A	Cumulated number of persons detected by the device since last reset
4	Reset of cumulated number	E	N/A	Optional	N/A	Reset the cumulated number of persons
5	Daily number of passages	R	Integer	Optional	N/A	Number of passages (same people could be counted multiple times if identified several times) today
6	Cumulated number of passages	R	Integer	Optional	N/A	Cumulated number of passages since last reset
7	Reset of cumulated number of passages	E	N/A	Optional	N/A	Reset the cumulated number of passages
8	Type of sensor	RW	String	Optional	N/A	Type of sensor (e.g. Bluetooth beacon, WIFI detector)

The instance for each attribute of this object is “Single”.
Click [here](#) to go back to the list of devices.

12.4. Lwm2m location

Description

This Lwm2m object enable a device to be located and speed to be measured.

Object definition

Name	Object ID	Object Version	LWM2M Version
Location	6	1.0	Yes
Object URN		Instances	Mandatory or Optional

urn:oma:lwm2m:oma:6	Single	Optional
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Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
0	Latitude	R	Float	Mandatory	Deg	The decimal notation of latitude, e.g. -43.5723 [World Geodetic System 1984].
1	Longitude	R	Float	Mandatory	Deg	The decimal notation of longitude, e.g. 153.21760 [World Geodetic System 1984].
2	Altitude	R	Float	Optional	Meter	The decimal notation of altitude in meters above sea level.
3	Radius	R	Float	Optional	Meter	The value in the Radius Resource indicates the size in meters of a circular area around a point of geometry.
4	Velocity	R	Opaque	Optional	N/A	The velocity in the LwM2M Client is defined in [3GPP-TS_23.032].
5	Timestamp	R	Time	Mandatory	N/A	The timestamp of when the location measurement was performed.
6	Speed	R	Float	Optional	m.s	Speed is the time rate of change in position of a LwM2M Client without regard for direction: the scalar component of velocity.

The instance for each attribute of this object is “Single”.

Click [here](#) to go back to the list of devices.

Click [here](#) to go the LwM2M description on the OMA web site.

13. uCIFI Smart Waste Objects

13.1. Filling level sensor

Description

The uCIFI filling level sensor measures how full and/or how empty a container (e.g. waste, fuel) is and reports it either in percentage or in centimeters. The filling level sensor may be complemented with a temperature sensor to compose a waste filling sensor that can also identify waste container fire.

Object definition

Name	Object ID	Object Version	LWM2M Version
Filling level	3435	1.0	Not yet submitted
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3435		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or Optional	Unit	Description
1	Container height	RW	Integer	Optional	Centimeters	Height of the container
2	Actual filling percentage	R	Float	Mandatory	%	Percentage of container filled with content
3	Actual filling level	R	Integer	Optional	Centimeters	Height of content in the container
4	High threshold	RW	Float	Optional	%	Threshold above which the container is considered full
5	Container full	R	Boolean	Mandatory	N/A	Set to True if the actual filling percentage is above the high threshold
6	Low threshold	RW	Float	Optional	%	Threshold below which the container is considered empty
7	Container empty	R	Boolean	Optional	N/A	Set to True if the actual filling percentage is below the low threshold
8	Average filling speed	R	Float	Optional	% per day	Average percentage filled per day



9	Average filling speed reset	E	N/A	Optional	N/A	Reset average filling speed
10	Forecast full date	R	Time	Optional	N/A	Next date at which the container should reach the high threshold
11	Forecast empty date	R	Time	Optional	N/A	Next date at which the container should reach the low threshold
12	Container out of location	R	Boolean	Optional	N/A	Set to True if the container is not at the location where it should be
13	Container out of position	R	Boolean	Optional	N/A	Set to True if the container is not in correct upright position

The instance for each attribute of this object is “Single”.
Click [here](#) to go back to the list of devices.

14. uCIFI events

uCIFI events are used to send a set of data using a JSON or CBOR message from the device to the cloud when a specific event occurs.

Using this uCIFI event mechanism, a device could, for instance, send the electrical values (e.g. voltage, current, power, power factor) of an Outdoor Lamp Actuator object when the actual light state (i.e. dimming level of the light source) changes.

A device could also leverage this mechanism to send the value of the power when a “high power” event is detected (i.e. when the measured active power is above the high power threshold).

Here is an example of a uCIFI event and associated message when a high power is detected (in black, the event information, in green, contextual value):

Send - New Value:

```
[
  {"n":"/27000/0/26251", "v":4},          -- Severity = ERROR
  {"n":"/27000/0/26252", "v":1},        -- Set = 1
  {"n":"/27000/0/26277", "sv":"3416/0/23"}, -- EvtReference event resource = high power
  {"n":"/27000/0/5518", "v":1546599003}, -- Timestamp
  {"n":"/3416/0/22", "v":77},           -- high power threshold = 77 watts
  {"n":"/3416/0/3", "v":85},           -- measured active power = 85 watts
]
```

When the situation is back to normal, the device would send the following message:

Send - New Value:

```
[
  {"n":"/27000/0/26251", "v":4},          -- Severity = ERROR
  {"n":"/27000/0/26252", "v":0},         -- Set = 0
  {"n":"/27000/0/26277", "sv":"3416/0/23"}, -- EvtReference event resource = high power
  {"n":"/27000/0/5518", "v":1546729003}, -- Timestamp
  {"n":"/3416/0/22", "v":77},           -- high power threshold = 77 watts
  {"n":"/3416/0/3", "v":65},           -- measured active power = 65 watts
]
```

15. uCIFI schedulers

15.1. Scheduler manager

Description

The scheduler manager object defines the scheduling capability, i.e. the types of scheduled commands, that a device is able to operate.

Object definition

Name	Object ID	Object Version	LWM2M Version
Scheduler manager	3440	1.0	Not yet submitted
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3440		Single	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or optional	Unit	Description
1	Not yet public					
2	Not yet public					
...	Not yet public					
6	Not yet public					

The instance for each attribute of this object is “Single”.

15.2. Time command

Description

The time command object defines a command that should be executed by a device at a given time. This time command, as well as sensor commands, shall be called/programmed in the “Program” objects and scheduled with the “Scheduler” object.

Object definition

Name	Object ID	Object Version	LWM2M Version
Time command	3441	1.0	Not yet submitted

Object URN	Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3441	Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or optional	Unit	Description
1	Not yet public					
2	Not yet public					
3	Not yet public					
...	Not yet public					
5	Not yet public					

The instance for each attribute of this object is “Single”.

15.3. Sensor command

Description

The sensor command object defines a command that should be executed depending on a message from a sensor object. This sensor commands, as well as time commands, shall be called/programmed in the “Program” objects and scheduled with the “Scheduler” object.

Object definition

Name	Object ID	Object Version	LWM2M Version
Sensor command	3442	1.0	Not yet submitted

Object URN	Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3442	Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or optional	Unit	Description
1	Not yet public					
2	Not yet public					
3	Not yet public					
...	Not yet public					
5	Not yet public					

The instance for each attribute of this object is “Single”.

15.4. Program

Description

The program object defines the times at which a list of commands should be executed during a particular day. Programs shall be called/scheduled in the “Scheduler” object to let the device know which day this program (i.e. list of commands) should be executed.

Object definition

Name	Object ID	Object Version	LWM2M Version
Program	3443	1.0	Not yet submitted
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3443		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or optional	Instance	Unit	Description
1	Not yet public						

2	Not public	yet						
3	Not public	yet						
...	Not public	yet						
5	Not public	yet						
6	Not public	yet						

15.5. Scheduler

Description

The scheduler object defines the days at which a program (i.e. a list of commands) should be executed. Programs shall be called/scheduled in the “Scheduler” object to let the device know which day this program (i.e. list of commands) should be executed.

Object definition

Name	Object ID	Object Version	LWM2M Version
Scheduler	3444	1.0	Not yet submitted
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3444		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or optional	Unit	Description
1	Not public	yet				
2	Not public	yet				
3	Not public	yet				

...	Not public	yet					
5	Not public	yet					
6	Not public	yet					

The instance for each attribute of this object is “Single”, except the resource “Program”.

16. uCIFI edge computing

16.1. Edge computing manager

Description

The uCIFI edge computing manager object defines the capability of a device to run scripts on the device itself.

Object definition

Name	Object ID	Object Version	LWM2M Version
Edge computing manager	3436	1.0	Not yet submitted
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3436		Single	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or optional	Unit	Description
1	Max number of scripts	R	Integer	Optional	N/A	Maximum number of scripts supported by the device
2	Number of free slots for scripts	R	Integer	Optional	N/A	Number of free slots to store new scripts
3	Max number of conditions	R	Integer	Optional	N/A	Maximum number of conditions supported by the device
4	Number of free slots for conditions	R	Integer	Optional	N/A	Number of free slots to store new conditions.
5	Edge-computing capabilities	R	String	Optional	N/A	Vendor-specific resource to share the capabilities of the devices as regards to edge computing.

The instance for each attribute of this object is “Single”.

16.2. Edge computing script

Description

The uCIFI edge computing scripts object defines a particular script to be executed by a device under a time or any other condition set by a “Edge Computing Time Condition” or “Edge Computing Generic Condition” object.

Object definition

Name	Object ID	Object Version	LWM2M Version
Edge computing script	3437	1.0	Not yet submitted
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3437		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or optional	Unit	Description
1	Name	RW	String	Optional	N/A	Name of the script
2	Signature	RW	String	Optional	N/A	Unique hash or signature associated to the script to be verified by the end-device before execution
3	Version	RW	String	Optional	N/A	Version of the script, as defined by the vendor
4	Script	RW	Opaque	Mandatory	N/A	Vendor-specific script
5	Script format	RW	String	Optional	N/A	Script format to enable the device to select the script interpreter in case it supports multiple (e.g. LUA)
6	Non-supported script	R	Boolean	Optional	N/A	Set to True if the script is not supported or if the device has identified errors in the script

7	Non authorized script	R	Boolean	Optional	N/A	Set to True if the hash/signature is not correct.
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The instance for each attribute of this object is “Single”.

16.3. Edge computing time condition

Description

The uCIFI edge computing time condition object defines the day/time (defined as a CRON rule) at which a particular script should be executed by a device.

Object definition

Name	Object ID	Object Version	LWM2M Version
Edge computing time condition	3438	1.0	Not yet submitted
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3438		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or optional	Unit	Description
1	Execution time/day	RW	String	Mandatory	N/A	Date/time at which the script should be executed, formatted as a CRON rule
2	Script identifier	RW	String	Mandatory	N/A	Object URN/Resource ID of the script to apply to the times/days defined in the execution time/day resource Important: this resource may have multiple instances
3	Non supported time condition	R	Boolean	Optional	N/A	Set to True if the device can't support the condition

The instance for each attribute of this object is “Single”.



16.4. Edge computing generic condition

Description

The uCIFI edge computing generic condition object defines a vendor-specific condition (e.g. when a resource or an object is equal to a particular value) at which a particular script should be executed by the device.

Object definition

Name	Object ID	Object Version	LWM2M Version
Edge computing time condition	3439	1.0	Not yet submitted
Object URN		Instances	Mandatory or Optional
urn:oma:lwm2m:ext:3439		Multiple	Optional

Resource definition

ID	Name	RWE	Type	Mandatory or optional	Unit	Description
1	Vendor condition	RW	Opaque	Optional	N/A	Condition described in a vendor specific way
2	Script identifier	RW	String	Mandatory	N/A	Object URN/Resource ID of the script to apply to the time/days defined in the vendor condition resource Important: this resource may have multiple instances
3	Non supported condition	R	Boolean	Optional	N/A	Set to True if the device can't support the condition.

The instance for each attribute of this object is "Single".



17. Join uCIFI

To join the uCIFI Alliance and contribute to future development of the uCIFI device data model, please go to <https://ucifi.org> and fill-in the member request form. The uCIFI Administration will send you the uCIFI Alliance Agreement corresponding to the level of engagement of your preference.

