



Certified Capability List

This Capability List is based on a certification session performed by the *TALQ Certification Tool (v2.5.0-update.2)* on 2023-04-29 17:01:53.832 -0300.

The Capability List is a consolidated list of TALQ features which are implemented in a product.

The tool has successfully performed 49 tests.

Product details

Product Name Bridge

Company LRL

Type GATEWAY

Notes

Generated on 2023-04-29 17:01:53.832 -0300

Supported profiles • Lighting

API version certified: 2.5.0

Certification performed by app version: 2.5.0-update.2

Capability list

Security

Enabled ✓

Functions

Basic

The Basic function describes the properties related to the physical asset to which the logical device is associated, such as identification (assetId) and location information.

Attributes

#	Attribute	Description
✓	displayName	Display name of the asset.
✓	assetId	Customer identifier of the asset. If multiple devices have the same assetId it means they belong to the same asset.
✓	serial	Serial number of the device.
✓	hwVersion	Hardware revision of the device.
✓	swVersion	Software version installed on the device.
✓	deviceReset	The physical device containing the logical device was reset.
✓	timeZone	Time zone of the device. Time zone may be expressed in two formats. <timezone> where <timezone> is a time zone as defined in the zone.tab of the IANA timezone database [IANA]; and stdoffset[dst[offset][,start[/time],end[/time]]] as defined by the Open Group for posix systems [POSIX]. [DEPRECATED: This attribute has been deprecated and it will be removed in the next MAJOR release. Please use the new TimeFunction.timeZone instead.]
✓	currentTime	Current time of the device defined as local time with time zone designator. [DEPRECATED: This attribute has been deprecated and it will be removed in the next MAJOR release. Please use the new TimeFunction.currentTime instead.]

Events

#	Event type	Description
✓	deviceReset	The physical device containing the logical device was reset

Communication

The Communication Function contains attributes related to the communication within the ODN, and between ODN devices and Gateways. Although communication within the ODN is outside the scope of the TALQ Smart City Protocol, this Function enables access to a minimum set of

configuration and state information of the ODN communication interface in order to facilitate system management from the CMS.

Attributes

#	Attribute	Description
✓	communicationType	Type of communication technology implemented by the ODN (e.g. power line, wireless).
✓	logicalAddress	Logical address for communication within the ODN scope (IP address, Short Address, ...).
✓	altLogicalAddress	Additional logical address used for communication within the ODN, for instance, group communication address (not a TALQ group address).
✓	physicalAddress	Physical address of the device. For example, IEEE MAC address. This attribute can be used to map between logical and physical devices. The format is specific to the ODN implementation.
✓	parentAddress	TALQ Address of the parent device, e.g. gateway. It shall point to a specific communication function.
✓	transmitPower	Transmit power used by the device within the ODN.
✓	communicationQuality	Indicator of the quality of the communication with the device. 100% means good quality.
✓	communicationFailure	This attribute is updated by the ODN when the communication function is not operating as expected.
✓	applicationType	Application Type of the communication function depending on the use case. E.g.: PL Communication Monitor

Events

#	Event type	Description
✓	communicationFailure	This event is generated by the ODN when the communication function is not operating as expected

Gateway

The Gateway function includes the necessary attributes to enable the communication between the CMS and the Gateway according to the TALQ Specification.

Attributes

#	Attribute	Description
---	-----------	-------------

✓ cmsUri	Base URI for TALQ communication that allows the Gateway to access the CMS. Must be an absolute URI. Other URI's for accessing CMS can be relative to this base.
✓ cmsAddress	CMS UUID address
✓ gatewayUri	Base URI for TALQ communication that allows the CMS to access the Gateway. Must be an absolute URI. Other URI's for accessing Gateway can be relative to this base.
✓ gatewayAddress	Gateway UUID address
✓ retryPeriod	Time duration before the Gateway retransmits a message for which expected response has not been received. [DEPRECATED: This attribute has been deprecated and it will be removed in the next MAJOR release. Please use the new GatewayFunction.gatewayRetryPeriod instead.]
✓ crlUrn	URI where the Gateway can obtain the Certification Revocation List (CRL).
✓ vendor	Vendor identification.
✓ newCmsAttached	This attribute is updated if, prior to the current bootstrap, one or more other CMS were already attached. Support for more than one CMS is optional.

Lamp Actuator

The Lamp Actuator function includes attributes related to lighting control and it represents the smallest unit for control purposes. In practice, however, a Lamp Actuator function can control combinations of several lamps and control gear but all in the same way, as if they are all one individual unit.

Attributes

#	Attribute	Description
✓	lampTypeId	TALQ Address of an existing lampType.
✓	cloEnabled	Determines whether a Constant Light Output (CLO) correction factor is used. CLO is used to compensate for lumen output degradation over the life time of the lamp. If CLO is enabled, lamps are dimmed part of the lampType.
✓	defaultLightState	Sets the default light output for the lamp actuator. This shall be applicable if no other command is active. This attribute shall be set to 100% as default value.
✓	targetLightCommand	Latest command for the lamp actuator.

✓ feedbackLightCommand	This attribute reflects the command in effect and it might deviate from the actualLightState due to propagation time or due to internal ODN specific mechanisms to handle the priority of the requests.
✓ actualLightState	This attribute should reflect the physical state of the light source as much as possible, including factors such as CLO. It may be calculated or measured, depending on the specific ODN implementation, which is outside the scope of this specification.
✓ calendarID	TALQ Address of the calendar controlling this lamp actuator. If this attribute is empty, the behavior shall be determined by the ODN. If the attribute is invalid, the ODN shall trigger a generic invalid address event and the behavior shall be determined by the ODN.
✓ invalidCalendar	The lamp actuator function has been allocated a calendar that it cannot implement.
✓ invalidProgram	The lamp actuator function has been allocated a control program that it cannot implement.
✓ lightStateChange	Light state has changed.
✓ targetLightCommandChange	The targetLightCommand operational attribute has changed.
✓ programChange	The control program applicable to the lamp actuator has changed (these are the points at which the calendar changes the program).
✓ calendarChange	The calendar applicable to the lamp actuator has changed.

Events

#	Event type	Description
✓	lightStateChange	Light state has changed
✓	invalidCalendar	The lamp actuator function has been allocated a calendar that it cannot implement
✓	invalidProgram	The lamp actuator function has been allocated a control program that it cannot implement
✓	targetLightCommandChange	The targetLightCommand operational attribute has changed

- | | |
|------------------|---|
| ✓ programChange | The control program applicable to the lamp actuator has changed |
| ✓ calendarChange | The calendar applicable to the lamp actuator has changed |

Lamp Monitor

The Lamp Monitor function enables monitoring of lamp parameters. A Lamp Monitor function should be associated with a specific lamp/control gear combination. Multiple lamp monitor functions may be implemented by a single device.

Attributes

#	Attribute	Description
✓	lampTypeId	TALQ Address of an existing lamp type. If not set to a valid value, this shall be the lamp type used in the lamp actuator. If this attribute is not supported in the implementation, the lamp monitor shall use the lamp type specified in the corresponding lamp actuator.
✓	numberOfLamps	Number of lamps being monitored by the lamp monitor function.
✓	operatingHours	Number of hours the lamp is on. This is the value used in CLO and may be set by the CMS.
✓	supplyVoltage	RMS supply volts when supplyType is AC, supply voltage (V) when supplyType is DC.
✓	supplyCurrent	RMS supply current (A) when supplyType is AC, supply current (A) when supplyType is DC.
✓	activePower	Active power.
✓	reactivePower	Reactive power.
✓	apparentPower	Apparent Power.
✓	powerFactor	Active power/Apparent power.
✓	activeEnergy	Cumulative active energy (since installation or counter reset).
✓	lampPowerTooHigh	Lamp power is greater than expected lamp power + lampPowerTolerance.
✓	lampPowerTooLow	Lamp power is smaller than expected lamp power - lampPowerTolerance
✓	lampVoltageTooHigh	Level of lamp voltage (not supply voltage) is greater than highLampVoltageThreshold.

- ✓ lampVoltageTooLow Level of lamp voltage (not supply voltage) is smaller than lowLampVoltageThreshold.
- ✓ lampFailure The lamp is not operating as it is supposed to (e.g. the lamp is broken). This event shall be used to detect a situation where the lamp (or LED module(s)) should be lit, but produce no light. This could be detected by the current flowing or power consumed.
- ✓ powerFactorTooLow The power factor is below powerFactorThreshold.
- ✓ relayFailure Set in case of internal relay is failing (e.g. it may be stuck in either on or off position). Typically if contactor error is used as well.
- ✓ cyclingFailure Indicates the lamp is constantly switching ON and OFF in an unexpected manner. This event shall be used to indicate a lamp which cycles while it should be on. The actual detection algorithm is outside the scope of this specification.
- ✓ supplyLoss Indicates loss of mains power.

Events

#	Event type	Description
✓	lampPowerTooHigh	Lamp power is greater than expected lamp power + lampPowerTolerance
✓	lampPowerTooLow	Lamp power is smaller than expected lamp power - lampPowerTolerance
✓	powerFactorTooLow	The power factor is below powerFactorThreshold
✓	lampFailure	The lamp is not operating as it is supposed to (e.g. the lamp is broken). This event shall be used to detect a situation where the lamp (or LED module(s)) should be lit, but produce no light. This could be detected by the current flowing or power consumed.
✓	highTemperature	Indicates temperature is above the high threshold
✓	relayFailure	Set in case of internal relay is failing
✓	cyclingFailure	Indicates the lamp is constantly switching ON and OFF in an unexpected manner
✓	supplyLoss	Indicates loss of mains power
✓	lampUnexpectedOn	Indicates lamp is unexpectedly on

- ✓ supplyVoltageTooHigh Level of supply voltage is above the highLampVoltageThreshold.
- ✓ supplyVoltageTooLow Level of supply voltage is below the lowSupplyVoltageThreshold.

Photocell

A Photocell function models the capabilities of a photocell that can be used for lighting control. This function shall be supported by the CMS and optionally by the ODNs (Gateway).

Attributes

#	Attribute	Description
✓	onLevel	Illuminance level at which the photocell switches to on state.
✓	offLevel	Illuminance level at which the photocell switches to off state.
✓	photocellOutput	Output state of the photocell. Possible values are ON (means the illuminance level has fallen below the onLevel) and OFF (means the illuminance level has risen above the offLevel).
✓	photocellOutputOn	The photocell output has changed to ON.

Events

#	Event type	Description
✓	photocellOutputOn	The photocell output has changed to ON

Light Sensor

A Light Sensor function models the output of light sensor. This function is optional for both CMS and Gateway, but when supported the requirements in this section shall apply.

Attributes

#	Attribute	Description
✓	lightLevel	Illuminance level.

Events

#	Event type	Description
---	------------	-------------

Temperature Sensor

The Temperature Sensor function allows a CMS to monitor the temperature in a device and send events in case the value is above/below configurable thresholds.

Attributes

#	Attribute	Description
✓	temperatureHighThreshold	Threshold above which a temperatureTooHigh event is triggered.
✓	temperature	Output temperature.
✓	temperatureTooHigh	Indicates the output temperature is above the temperatureHighThreshold.

Events

#	Event type	Description
✓	temperatureTooHigh	Indicates the output temperature is above the temperatureHighThreshold.

Location Sensor*

The Location Sensor Function is used to indicate that an object has changed position attributes configurable by the CMS or based on internal setup of the vendor. For example, a specific location (latitude, longitude) of a device could be defined by the vendor. If the device is equipped with a GPS, it could send a specific event indicating that its position is different to the one defined by the CMS. We might also want to let the configuration to the vendor itself and simply define events notifying the CMS that the default configuration has changed. For example, a garbage bin could have its location defined based on a sensor placed on the floor. If the bin is not above this sensor, the vendor will trigger an event. In this last case, the CMS does not need to configure anything.

Attributes

#	Attribute	Description
✓	expectedLocation	Nominal location of the device
✓	location	Location of the device
✓	locationChanged	Triggered when the difference between location and expectedLocation is above locationChangedThreshold

Events

#	Event type	Description
✓	locationChanged	Triggered when the difference between location and expectedLocation is above locationChangedThreshold

Time*

The Time function includes attributes related to generic control and it represents the smallest unit for control purposes.

Attributes

#	Attribute	Description
✓	timeZone	Time zone of the device. Time zone may be expressed in two formats. where is a time zone as defined in the zone.tab of the IANA timezone database [IANA]; and stdoffset[dst[offset] [,start[/time],end[/time]]] as defined by the Open Group for posix systems [POSIX].
✓	currentTime	Current time of the device defined as local time with time zone designator.
✓	lastTimeSync	Last time at which a successful time synchronization occurred.

Events

#	Event type	Description
---	------------	-------------

Luminaire Asset

This entity contains the managed and tracked attributes of a specific Luminaire, excluding the concept of Controller and Driver.

Attributes

#	Attribute	Description
✓	luminaireTypeAddress	Address of the Luminaire Type
✓	serial	Serial number of the Luminaire
✓	projectID	Name of the Project / Tender
✓	luminousFluxConfiguration	Programmed light output of the luminaire
✓	paintingColor	Painting color of the luminaire expressed as a color system-color value, (e.g: RAL-7035)
✓	virtualPowerOutput	Percentage of nominal power at which the light source should be set when the Command is set to 100%.
✓	installationTimestamp	Installation date and time of luminaire

✓ identification	Luminaire identification. (e.g: as per DiiA/D4i specification part 251 (MB1 extension)).
✓ identificationNumber	Luminaire identification number. (e.g: as per DiiA/D4i specification part 251 (MB1 extension))
✓ mountingOption	Installed direction of the luminaire to the support
✓ warrantyExpirationDate	Warranty expiration date. It can be reset
✓ manufactureYear	Year of manufacture of the luminaire.
✓ manufactureWeek	Week of manufacture of the luminaire.
✓ warrantyYears	Number of years for warranty
✓ applicationType	Application Type of the luminaire asset depending on the use case.

Controller Asset

This entity contains the managed and tracked attributes of a specific controller

Attributes

#	Attribute	Description
✓	controllerTypeAddress	Address of the Controller Type
✓	serial	Serial number of the Controller
✓	firmwareVersion	Version of the controller hardware firmware
✓	installationTimestamp	Installation date and time of OLC
✓	registrationTimestamp	Registration date and time of OLC
✓	projectID	Name of the Project / Tender
✓	controllerColor	Painting color of the controller expressed as a color system-color value, (e.g: RAL-7035)
✓	connectionType	Type of the connection to the luminaire
✓	warrantyExpirationDate	Warranty expiration date. It can be reset
✓	manufactureYear	Year of manufacture of the controller
✓	manufactureWeek	Week of manufacture of the controller
✓	applicationType	Application Type of the controller asset depending on the use case.

Services

Configuration Service

The TALQ Configuration Service enables discovery and configuration of devices and services

Options

#	Option	Value	Description
✓	commissioningSupported*		This ODN can support commissioning from the CMS side.
✓	devicesPaginationSupported*		This ODN can support pagination of devices.

Control Service

The Control service describes the mechanisms to operate the actuator functions in order to enable schedule based and override control

Options

#	Option	Value	Description
✓	supportedTypes	<ul style="list-style-type: none"> AbsoluteActivePeriod AstroClockActivePeriod ExternalControlEffect* FixedControlEffect* ccDate* ccDay* 	Control Program and calendar options supported are defined by announcing support for the given modes
✓	dayOffset	<ul style="list-style-type: none"> 1 2 	Offset of start of day
✓	ccDateSupport		Indicates the ccDate options supported
✓	ccDaySupport		Indicates the ccDay options supported

✓ effectOperationsSupport	<ul style="list-style-type: none"> • set • min • max • add • sub • mul 	Indicates the dynamic control effect operations supported
✓ programSecondsSupported*		Indicates whether the field of seconds is supported in programs.

Events

#	Event Type	Description
✓	invalidCalendar	An invalid calendar has been provided by the CMS to the ODN
✓	invalidProgram	A control program has been provided by the CMS, which cannot be implemented by the ODN

Data Collection Service

The TALQ Data Collection Service is a provision to configure how ODN measurements, status information and events are logged, and when or under what conditions the logged data is transferred to the CMS

Options

#	Option	Value	Description
✓	supportedModes	<ul style="list-style-type: none"> • EventRecordingMode • VendorRecordingMode • ImmediateReportingMode 	Recording and Reporting modes supported
✓	samplingPeriodSupported		Indicates whether the ODN supports periodic sampling for a data logger in periodic recording mode

✓ attributeScopeSupported

Indicates whether the ODN supports filtering attributes by scope (attributeScope); for a data logger in periodic or vendor recording mode.

Events

#	Event Type	Description
✓	invalidLoggerConfig	The CMS has provided a data logger configuration that cannot be implemented by the ODN

On Demand Data Request Service

This service provides the mechanism to access attributes in the logical devices by requesting attribute values from the ODN

Asset Management Service

The TALQ Asset Management Service provides a mechanism to transfer the types needed by the asset management functions

Objects

Luminaire Type

The LuminaireType consists of a set of attributes that together characterize, i.e.: are generic for, a given luminaire, excluding the concept of Controller, Driver and Bracket.

Properties

#	Property	Description
✓	address	TALQ address of the Luminaire Type
✓	name	Descriptive name of the LuminaireType
✓	gtin	Global Trade Item Number of luminaire
✓	manufacturerName	Name of manufacturer

✓ productFamily	Product family name of luminaire
✓ model	Product model of luminaire
✓ maximumLuminousFluxOutput	Maximum Light Output luminous flux output
✓ minimumLuminousFluxOutput	Minimum Light Output of the luminaire
✓ lightSourceType	Light source type.
✓ lightDistributionType	Enumeration of possible light distribution type, using the Zhaga D4i enumeration. Please refer to ZD4i standard for more details.
✓ maximumPower	Maximum power that the Luminaire can operate at
✓ powerAtMinimumDimLevel	Power at minimum dim level for the luminaire.
✓ materialEnclosure	Material of enclosure of the body of the luminaire
✓ materialLightCover	Material of light cover
✓ luminaireEfficacy	Efficacy of the luminaire
✓ warmUpTime	Sets the delay after a Switch ON command during which the lamp actuator shall not perform any dimming command.
✓ maxOperatingHours	Maximum number of operating hours that the lamp is supposed to live with a given specification. This attribute can be used to set the old lamp attributes when the lamp reaches its expected useful life.
✓ lumenDepreciationCurve	Ordered set of entries (cumulative operating hours, correction factor in %) that form a piece wise linear approximation of the lumen depreciation correction factor curve. The first cumulative hours should be 0 and the last correction factor should be 100%. E.g.: 0 h, 80%; 5000 h, 85%; 10000 h, 90%; 15000 h, 95%; 20000 h, 100%.
✓ cloType	Determines where CLO (Constant Lumen Output) is implemented in the lamp control gear or in the ODN (e.g. control device). This CLO profile is needed even when CLO is implemented by the driver in order to obtain the expected lamp power.
✓ lightSourceManufacturerName	Name of light source manufacturer
✓ lightSourceLedEfficacy	Efficacy of the LED

Controller Type

The ControllerType consists of a set of attributes that together characterize, i.e. are generic for, a given Controller.

Properties

#	Property	Description
✓	address	TALQ address of the Controller Type
✓	name	Descriptive name of the Controller Type
✓	locationPrecision	Accuracy of the location determination
✓	manufacturerName	Name of manufacturer
✓	productFamily	Product family name of the controller
✓	model	Model of the Controller
✓	mechanicalInterfaces	Type of mechanical connection or socket
✓	electricalInterfaces	The control interface protocol type of the connector of the driver.
✓	protocols	Type of digital communication of the controller

Lamp type

The lamp type consists of a set of attributes that together characterize a given lamp and control gear combination. When modelling a Lighting ODN with many luminaires, there are attributes' values that are the same for many lamps, e.g.: the expected consumed power of the lamp and control gear (wattage) would be the same for many lamp monitors. The concept of LampType is created to avoid including the same attributes' values in every lamp monitor and actuator of the same type, for this reason a reference to a lamp type is included in the lamp actuator and lamp monitor functions, as these attributes are required for proper operation of these functions. Thus, the definition of lamp types enables the CMS to efficiently set attributes in many lamp actuators/monitors by just setting the address of the 'lampType' attribute in each function. Lamp types can be created by both CMS and TALQ Gateway as separate entities. The TALQ Gateway shall announce any lamp type it has to the CMS as part of the initial configuration. In addition to the initial configuration, the TALQ Gateway shall also announce the lamp type whenever it changes. The CMS may also send lamp types to the TALQ Gateway.

Properties

#	Property	Description
✓	name	Descriptive name of the lamp type
✓	address	TALQ Address of the lamp type
✓	wattage	Expected consumed power of the lamp and control gear

- ✓ **controlType** Type of control/dimming interface between the lamp actuator function and the control gear or within the control gear in case lamp actuator is embedded in the control gear

Event log data

Event log data contains a single event, with eventType and value, in each single log entry. It also includes information about whether the log denotes the start or end of the event. Furthermore additional information can be added with the info attribute.

Properties

#	Property	Description
✓	eventType	Identifier of event reported
✓	srcAddress	Address of Logical device or function within a logical device which is the source of the event or to which this event applies

Command


A command defines a type of control action that can be applied to a function. Commands can be generated by a manual override action or by a control program.

Properties

#	Property	Description
✓	state	Light state to be applied to the lamp actuator
✓	reason	Indicates the command was triggered by override, sensor or control program
✓	cmsRefId	CMS reference, which can be used for data logging. The cmsRefId in a Command is a free text to be used by the CMS for any purpose, e.g: to differentiate contexts. It is a token that allows the CMS to match client requests to the original notification.

: The Certification Test Tool is designed to provide a high level of confidence that complementary systems can communicate successfully. As both the protocol and the test tool evolve, all mandatory and other core tests are confirmed by comparison with real-life scenarios (plug-fest or similar). Some tests of optional and more peripheral features may not yet have been confirmed in this way; such features are identified with an asterisk ().

This Capability List is based on a certification session performed by the TALQ Certification Tool (v2.5.0-update.2) on 2023-04-29 17:01:53.832 -0300.

 and **TALQ** are trademarks owned by the TALQ Consortium.

© TALQ Consortium

