



# Certified Capability List

This Capability List is based on a certification session performed by the *TALQ Certification Tool (v2.5.1-update.2)* on 2024-01-08 10:37:13.258 +0800.

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

The tool has succesfully performed 32 tests.

## Product details

**Product Name** ConnectCity Platform

**Company** Rongwen

**Type** CMS

**URL** <https://talq-consortium.org:9043/talq/v2/gateway>

### Notes

**Generated on** 2024-01-08 10:37:13.258 +0800

**Supported profiles** • Lighting

**API version certified:** 2.5.1

**Certification performed by app version:** 2.5.1-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.
✓	hwType	Hardware type of the device.
✓	swType	Software type of device. This attribute may be useful if the same hardware supports multiple firmware versions with different functions.
✓	swVersion	Software version installed on the device.
✓	installationDate	The installation date of Physical Device.
✓	location	Latitude, Longitude and Altitude. [DEPRECATED: This attribute has been deprecated and it will be removed in the next MAJOR release. Please use the new LocationSensorFunction.location instead.]
✓	batteryMode	Device operating in battery mode.
✓	installationMode	Device is being installed.
✓	maintenanceMode	Device is undergoing maintenance, where maintenance may include hardware or software related maintenance actions.

- ✓ **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.]

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- ✓ **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.]

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- ✓ **commandConfirmation** Allows the CMS to reboot, factory reset or configuration reset of the device. Before rebooting or resetting the device this attribute has to be true. Default value = false

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- ✓ **reboot** Reboot the device. This operational attribute requires the commandConfirmation attribute value to be set to true.

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- ✓ **factoryReset** Reset the device to factory settings. This operational attribute requires the commandConfirmation attribute value to be set to true.

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- ✓ **operatingHours** Number of operating hours of the device.

## Events

#	Event type	Description
✓	deviceReset	The physical device containing the logical device was reset
✓	softwareUpdating	Indicates software updating is in progress
✓	batteryMode	Device operating in battery mode
✓	installationMode	Device is being installed
✓	maintenanceMode	Device is undergoing maintenance
✓	cabinetDoorOpen	Cabinet door is open. [DEPRECATED: This attribute has been deprecated and it will be removed in the next MAJOR release. Please use the new SegmentMonitor.cabinetDoorOpen instead.]
✓	batteryShutdown	Indicates the device has shut down due to battery discharge
✓	locationUpdated	Indicates the location of a device has changed.

## 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.
✓	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
✓	crlUrn	URI where the Gateway can obtain the Certification Revocation List (CRL).
✓	vendor	Vendor identification.
✓	currentReleaseId	Release ID of currently deployed release. This is used in the data package service.

## 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
✓	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.
✓ calendarChange	The calendar applicable to the lamp actuator has changed.
✓ applicationType	Application Type of the lamp actuator depending on the use case. E.g.: Lamp actuator, Cabinet actuator

## 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

## 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
✓	supplyType	Supply type of the lamp. Accepted values are: AC, DC.
✓	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.

✓ temperature	Temperature of the device implementing this function. [DEPRECATED: This attribute has been deprecated and it will be removed in the next MAJOR release. Please use the new TemperatureSensorFunction.temperature instead.]
✓ 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.
✓ powerFactor	Active power/Apparent power.
✓ powerFactorSense	Phase sense of power factor.
✓ 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.
✓ currentTooHigh	Supply current is above the highCurrentThreshold defined in the lamp type.
✓ currentTooLow	Supply current is below the lowCurrentThreshold defined in the lamp type.
✓ powerFactorTooLow	The power factor is below powerFactorThreshold.

✓ highTemperature	Indicates temperature is above the high threshold [DEPRECATED: This attribute has been deprecated and it will be removed in the next MAJOR release. Please use the new TemperatureSensorFunction.temperatureTooHigh instead.]
✓ absoluteLampPowerTooHigh	Indicates the power is above the lampPowerHighThreshold in the lamp type
✓ absoluteLampPowerTooLow	Indicates the power is below the lampPowerLowThreshold in the lamp type
✓ controlGearCommFailure	Indicates failure of the control gear.
✓ supplyLoss	Indicates loss of mains power.
✓ supplyVoltageTooHigh	Level of supply voltage is above the highLampVoltageThreshold.
✓ supplyVoltageTooLow	Level of supply voltage is below the lowSupplyVoltageThreshold.
✓ highSupplyVoltageThreshold	Supply voltage above which the supplyVoltageTooHigh event is triggered.
✓ lowSupplyVoltageThreshold	Supply voltage below which the supplyVoltageTooLow event is triggered.

## Events

#	Event type	Description
✓	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.
✓	currentTooHigh	Supply current is above the highCurrentThreshold defined in the lamp type
✓	currentTooLow	Supply current is below the lowCurrentThreshold defined in the lamp type
✓	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
✓ absoluteLampPowerTooHigh	Indicates the power is above the lampPowerHighThreshold in the lamp type
✓ absoluteLampPowerTooLow	Indicates the power is below the lampPowerLowThreshold in the lamp type
✓ controlGearCommFailure	Indicates failure of the control gear
✓ cyclingFailure	Indicates the lamp is constantly switching ON and OFF in an unexpected manner
✓ supplyLoss	Indicates loss of mains power
✓ contactorError	Indicates error in contactor
✓ lampUnexpectedOn	Indicates lamp is unexpectedly on
✓ leakageDetected	Indicates that an earth leakage fault has been detected
✓ supplyVoltageTooHigh	Level of supply voltage is above the highLampVoltageThreshold.
✓ supplyVoltageTooLow	Level of supply voltage is below the lowSupplyVoltageThreshold.

## Electrical Meter

The electrical meter function supports electrical metering capabilities including measurements of voltage, current, power, energy, and power factor. This function may be associated with Luminaire Controllers, Cabinet Controllers or electrical meters installed in switch boxes. ODNs may implement both single phase and three phase meters. Typically meters within a control device will be single phase and stand-alone meters. A street side cabinet may have single phase or three phase meters.

### Attributes

#	Attribute	Description
✓	totalPower	Sum of the active power consumed on phase 1, 2 and 3, or just the power for a single phase meter.

- ✓ **totalActiveEnergy** Total cumulative kWh measured by the meter since installation date (or counter reset).

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- ✓ **totalPowerFactor** Total active power divided by total apparent power.

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- ✓ **supplyVoltage** Average between Phase1 RMS Voltage, Phase2 RMS Voltage and Phase3 RMS Voltage, or in the case of a single phase meter just the RMS supply voltage.

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- ✓ **totalCurrent** Sum of the RMS currents on phase 1, 2 and 3.

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- ✓ **averageCurrent** Average RMS current on phase 1, 2 and 3.

### Events

#	Event type	Description
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### 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).

### Events

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

### 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
✓	locationChangedThreshold	Distance (meters)
✓	location	Location of the device

### Events

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

## 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
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✓ supportedTypes	<ul style="list-style-type: none"> <li>AbsoluteActivePeriod</li> <li>AstroClockActivePeriod</li> </ul>	Control Program and calendar options supported are defined by announcing support for the given modes
✓ maxProgramsPerCalendar		Maximum number of control programs per calendar
✓ maxSwitchPointsPerProgram		Maximum number of switching points per control program
✓ ccDaySupport		Indicates the ccDay options 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"> <li>EventRecordingMode</li> <li>VendorRecordingMode</li> <li>ImmediateReportingMode</li> </ul>	Recording and Reporting modes supported

✓ 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

## Group Management Service

This service provides the mechanisms to define and manage groups

### Options

#	Option	Value	Description
✓	maximumGroupSize		Maximum number of group members per group

## Data Package Transfer Service\*

This service provides a mechanism to transfer data packages containing ODN vendor specific information to the Gateway via the CMS

### Events

#	Event Type	Description
✓	releaseMismatch	The release indicated as expected does not match the actual release of the Gateway.
✓	changeReleaseFailure	Change release failed. Operation is rolled back.
✓	packageChangeFailure	A Package change operation failed. Operation is rolled back.

- ✓ **changingRelease** Indicates the Gateway is in the process of changing release.
- ✓ **packageDownloaded** Indicate the Gateway has downloaded a package.

### Test Service

This service provides a mechanism to reduce the human intervention during the certification tests, enabling the certification tests to maximise automation

## Objects

### 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
✓	startEndFlag	If the event denotes either the start or end of a 'special' period, this flag shall be included

### 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

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|----------------------|--|
| ✓ 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.  |
| ✓ refAddress         | Reference to the source of the command, e.g. sensor or control program   |
| ✓ start              | Time when the control action resulting from command shall start. This attribute is used only with override commands to set a time to start an override action. If not specified, the override command starts immediately.  |
| ✓ expiration         | Time when the control action resulting from command shall be terminated. This attribute is used only with override commands to set a time to stop an override action. After the expiration of an override command, the system should go back to the state defined by the active control program. If not specified, there is no expiration for the override command.  |
| ✓ rampToLevelTime*   | The time (in seconds) taken for the value to ramp to the specified level. The change will be finished rampToLevelTime seconds after: the scheduled time if the change comes from a control program; the reception of the request, or the command.start time attribute, if the change comes from an override command, or; the sensor event is raised if the control is sensor-based. If actions related to one command remain to be completed when a subsequent command is received, the subsequent command shall take precedence.                                    |
| ✓ rampFromLevelTime* | The time (in seconds) taken for the value to ramp to the specified level. The change will be finished rampFromLevelTime seconds after: the scheduled time if the change comes from a control program; the reception of the request if the change comes from an override command; expiry of the related command, or; the sensor event is lowered and the hold time subsequently expires if the control is sensor-based. If actions related to one command remain to be completed when a subsequent command is received, the subsequent command shall take precedence. |

## Group


A group is set of entities that can be addressed by the same group address. Devices and functions within devices can be assigned to a group. A group may also include other groups as members.

### Properties

#	Property	Description
✓	address	Group address
✓	members	TALQ Addresses of members of the group

\*: 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 (\*).

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