Certified Capability List

This Capability List is based on a certification session performed by the TALQ Certification Tool (v2.3.0-update.10) on 2021-09-07 16:32:58.199 +0200.

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

The tool has successfully performed 28 tests.

Product details

<table>
<thead>
<tr>
<th>Product Name</th>
<th>IBOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company</td>
<td>CGI</td>
</tr>
<tr>
<td>Type</td>
<td>CMS</td>
</tr>
<tr>
<td>Notes</td>
<td></td>
</tr>
<tr>
<td>Generated on</td>
<td>2021-09-07 16:32:58.199 +0200</td>
</tr>
<tr>
<td>Supported profiles</td>
<td>• Lighting</td>
</tr>
<tr>
<td>API version certified:</td>
<td>2.3.0</td>
</tr>
<tr>
<td>Certification performed by app version:</td>
<td>2.3.0-update.10</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>#</th>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔️</td>
<td>assetId</td>
<td>Customer identifier of the asset. If multiple devices have the same assetId it means they belong to the same asset.</td>
</tr>
<tr>
<td>✔️</td>
<td>serial</td>
<td>Serial number of the device.</td>
</tr>
<tr>
<td>✔️</td>
<td>hwType</td>
<td>Hardware type of the device.</td>
</tr>
<tr>
<td>✔️</td>
<td>swVersion</td>
<td>Software version installed on the device.</td>
</tr>
<tr>
<td>✔️</td>
<td>location</td>
<td>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.]</td>
</tr>
<tr>
<td>✔️</td>
<td>timeZone</td>
<td>Time zone of the device. Time zone may be expressed in two formats. &lt;timezone&gt; where &lt;timezone&gt; 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.]</td>
</tr>
<tr>
<td>✔️</td>
<td>currentTime</td>
<td>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.]</td>
</tr>
</tbody>
</table>

Events

<table>
<thead>
<tr>
<th>#</th>
<th>Event type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔️</td>
<td>deviceReset</td>
<td>The physical device containing the logical device was reset</td>
</tr>
<tr>
<td>✔️</td>
<td>batteryMode</td>
<td>Device operating in battery mode</td>
</tr>
<tr>
<td>✔️</td>
<td>installationMode</td>
<td>Device is being installed</td>
</tr>
<tr>
<td>✔️</td>
<td>maintenanceMode</td>
<td>Device is undergoing maintenance</td>
</tr>
</tbody>
</table>
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.]

Indicates the device has shut down due to battery discharge

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

<table>
<thead>
<tr>
<th>#</th>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔️</td>
<td>physicalAddress</td>
<td>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.</td>
</tr>
<tr>
<td>✔️</td>
<td>parentAddress</td>
<td>TALQ Address of the parent device, e.g. gateway. It shall point to a specific communication function.</td>
</tr>
</tbody>
</table>

Events

<table>
<thead>
<tr>
<th>#</th>
<th>Event type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔️</td>
<td>communicationFailure</td>
<td>This event is generated by the ODN when the communication function is not operating as expected</td>
</tr>
</tbody>
</table>

Gateway

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

Attributes

<table>
<thead>
<tr>
<th>#</th>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔️</td>
<td>cmsUri</td>
<td>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.</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>#</th>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓</td>
<td>defaultLightState</td>
<td>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.</td>
</tr>
<tr>
<td>✓</td>
<td>targetLightCommand</td>
<td>Latest command for the lamp actuator.</td>
</tr>
<tr>
<td>✓</td>
<td>feedbackLightCommand</td>
<td>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.</td>
</tr>
<tr>
<td>✓</td>
<td>actualLightState</td>
<td>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.</td>
</tr>
<tr>
<td>✓</td>
<td>calendarID</td>
<td>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.</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>#</th>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔️</td>
<td>numberOfLamps</td>
<td>Number of lamps being monitored by the lamp monitor function.</td>
</tr>
<tr>
<td>✔️</td>
<td>operatingHours</td>
<td>Number of hours the lamp is on. This is the value used in CLO and may be set by the CMS.</td>
</tr>
<tr>
<td>✔️</td>
<td>temperature</td>
<td>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.]</td>
</tr>
<tr>
<td>✔️</td>
<td>supplyVoltage</td>
<td>RMS supply volts when supplyType is AC, supply voltage (V) when supplyType is DC.</td>
</tr>
<tr>
<td>✔️</td>
<td>supplyCurrent</td>
<td>RMS supply current (A) when supplyType is AC, supply current (A) when supplyType is DC.</td>
</tr>
<tr>
<td>✔️</td>
<td>activePower</td>
<td>Active power.</td>
</tr>
<tr>
<td>✔️</td>
<td>powerFactor</td>
<td>Active power/Apparent power.</td>
</tr>
<tr>
<td>✔️</td>
<td>powerFactorSense</td>
<td>Phase sense of power factor.</td>
</tr>
<tr>
<td>✔️</td>
<td>activeEnergy</td>
<td>Cumulative active energy (since installation or counter reset).</td>
</tr>
</tbody>
</table>

Events

<table>
<thead>
<tr>
<th>#</th>
<th>Event type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔️</td>
<td>lampPowerTooHigh</td>
<td>Lamp power is greater than expected lamp power + lampPowerTolerance</td>
</tr>
<tr>
<td>✔️</td>
<td>lampPowerTooLow</td>
<td>Lamp power is smaller than expected lamp power - lampPowerTolerance</td>
</tr>
</tbody>
</table>
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

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

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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>totalPower</td>
<td>Sum of the active power consumed on phase 1, 2 and 3, or just the power for a single phase meter.</td>
</tr>
</tbody>
</table>
### totalActiveEnergy
Total cumulative kWh measured by the meter since installation date (or counter reset).

### totalPowerFactor
Total active power divided by total apparent power.

### 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.

### totalCurrent
Sum of the RMS currents on phase 1, 2 and 3.

### averageCurrent
Average RMS current on phase 1, 2 and 3.

### Events

<table>
<thead>
<tr>
<th>#</th>
<th>Event type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>photocellOutputOn</td>
<td>The photocell output has changed to ON</td>
</tr>
</tbody>
</table>

### 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

<table>
<thead>
<tr>
<th>#</th>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>onLevel</td>
<td>Illuminance level at which the photocell switches to on state.</td>
</tr>
<tr>
<td></td>
<td>offLevel</td>
<td>Illuminance level at which the photocell switches to off state.</td>
</tr>
<tr>
<td></td>
<td>photocellOutput</td>
<td>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).</td>
</tr>
</tbody>
</table>

### Events

<table>
<thead>
<tr>
<th>#</th>
<th>Event type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>photocellOutputOn</td>
<td>The photocell output has changed to ON</td>
</tr>
</tbody>
</table>

### Services

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

### Options

<table>
<thead>
<tr>
<th>#</th>
<th>Option</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
</table>

### Control Service

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

### Options

<table>
<thead>
<tr>
<th>#</th>
<th>Option</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
</table>

### Events

<table>
<thead>
<tr>
<th>#</th>
<th>Event Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>invalidCalendar</td>
<td>An invalid calendar has been provided by the CMS to the ODN</td>
</tr>
<tr>
<td></td>
<td>invalidProgram</td>
<td>A control program has been provided by the CMS, which cannot be implemented by the ODN</td>
</tr>
</tbody>
</table>

### 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

<table>
<thead>
<tr>
<th>#</th>
<th>Option</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>supportedModes</td>
<td>VendorRecordingMode</td>
<td>Recording and Reporting modes supported</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EventRecordingMode</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ImmediateReportingMode</td>
<td></td>
</tr>
</tbody>
</table>

### Events

<table>
<thead>
<tr>
<th>#</th>
<th>Event Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>invalidLoggerConfig</td>
<td>The CMS has provided a data logger configuration that cannot be implemented by the ODN</td>
</tr>
</tbody>
</table>

### 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

<table>
<thead>
<tr>
<th>#</th>
<th>Option</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
</table>

Objects

Event log data

Properties

<table>
<thead>
<tr>
<th>#</th>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>eventType</td>
<td>Identifier of event reported</td>
</tr>
<tr>
<td></td>
<td>srcAddress</td>
<td>Address of Logical device or function within a logical device which</td>
</tr>
<tr>
<td></td>
<td></td>
<td>is the source of the event or to which this event applies</td>
</tr>
<tr>
<td></td>
<td>startEndFlag</td>
<td>If the event denotes either the start or end of a 'special' period, this</td>
</tr>
<tr>
<td></td>
<td></td>
<td>flag shall be included</td>
</tr>
</tbody>
</table>

Command

Properties

<table>
<thead>
<tr>
<th>#</th>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>state</td>
<td>Light state to be applied to the lamp actuator</td>
</tr>
<tr>
<td></td>
<td>reason</td>
<td>Indicates the command was triggered by override, sensor or control program</td>
</tr>
<tr>
<td></td>
<td>cmsRefId</td>
<td>CMS reference, which can be used for data logging</td>
</tr>
<tr>
<td></td>
<td>refAddress</td>
<td>Reference to the source of the command, e.g. sensor or control program</td>
</tr>
<tr>
<td>Property</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>start</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>expiration</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>rampToLevelTime*</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>rampFromLevelTime*</td>
<td>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.</td>
<td></td>
</tr>
</tbody>
</table>

**Group**

**Properties**

<table>
<thead>
<tr>
<th>#</th>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓</td>
<td>address</td>
<td>Group address</td>
</tr>
<tr>
<td>✓</td>
<td>members</td>
<td>TALQ Addresses of members of the group</td>
</tr>
</tbody>
</table>
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 (v2.3.0-update.10) on 2021-09-07 16:32:58.199 +0200.

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