

Sensors & Controls

sceneCOM

Manual

REST API and MQTT



TRIDONIC

Legal information

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1 How to use these instructions

We are pleased that you have chosen this *Tridonic GmbH & Co KG* product. So that you can get the most from these instructions, this section provides the following information:

- Signs and icons in these instructions
- Further information
- Target audience of these instructions
- Software version

Signs and icons in these instructions

The following signs and icons are used in these instructions:


Sign/icon	Explanation
1.	Individual steps in the instructions are numbered.
▷	Single-step instructions are indicated by the ▷ icon at the beginning of the line.
↻	After a step has been described, a description of the expected results will follow. These results are indicated by the ↻ icon at the beginning of the line.
—	Requirements which need to be checked before carrying out a step are indicated by —.
i	Notes can be recognised by the i icon. In addition, notes are identified by the word Note .
[Bold text]	Bold text indicates words that are shown on a device display or software user interface.
	<p>Danger and safety instructions are indicated by this icon. Safety and warning information is labelled and classified using the following words:</p> <p>DANGER indicates an immediate danger. This could lead to death or severe injury if not avoided.</p> <p>WARNING indicates a potentially dangerous situation. This could lead to death or severe injury if not avoided.</p> <p>CAUTION indicates a potentially dangerous situation. This could lead to minor injury or damage to property if not avoided.</p> <p>Attention indicates a situation involving potential damage. If it is not avoided, the product or something in the vicinity may be damaged.</p>

Table 1: Signs and icons in these instructions

1 How to use these instructions

Further information

Further information on the setup and function of your *sceneCOM* system can be found in our product and system documentation.

If you should have any further questions, please contact your sales partner.

General information on our products can be found on our website:

www.tridonic.com

Target audience of these instructions

These instructions are aimed at system integrators without special product training, who want to control a *sceneCOM* system via a REST API and MQTT.

Software version

These instructions are based on software version *sceneCOM 3.5.0*.



Note

This manual contains path information which can be used to access the configuration options. The path always starts from the app overview.

Example: "Path: app overview > **Basic settings** > **Date and time**" means that you should go to the app overview, tap on **Basic settings** and then tap the **Date and time** button.

2 Other available documents

All *sceneCOM* manuals can be downloaded from the website:

<https://www.tridonic.com>

Manual	Description
Commissioning and maintenance	This manual is aimed at electricians without any special product training and describes how the basic functions can be commissioned. It also describes general maintenance functions.
Daylight linking	This manual is aimed at electricians without any special product training and describes how daylight linking with light sensor can be commissioned and configured.
Special luminaires	This manual is aimed at electricians without any special product training and describes how special luminaires (e.g. RGB luminaires, TW luminaires) can be commissioned and configured.
Self-contained emergency luminaires	This manual is aimed at electricians without specific product training and describes how emergency lighting functions for self-contained emergency luminaires can be commissioned, configured and monitored in a <i>sceneCOM</i> system that itself has already been commissioned.
Shows	This manual is aimed at electricians without any special product training and describes how shows can be commissioned and configured.
BACnet	This manual is aimed at electricians and system integrators without any special product training and describes how BACnet can be commissioned and configured.

Table 2: Other available documents – *sceneCOM*

3 Safety instructions



Attention

- The *sceneCOM* system may only be used for the application area specified.
- Relevant health and safety regulations must be observed.
- Assembly, installation and commissioning may only be carried out by qualified personnel.
- The *sceneCOM* system and connected devices can only be operated when in complete working order.
- The manufacturer is neither liable nor does it accept any guarantee for consequential damage that may occur if these instructions are not followed.

4 Navigation principles

There are different buttons in the web application for commissioning, configuring and operating the system. If a button is tapped, its colour changes briefly.



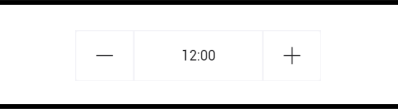
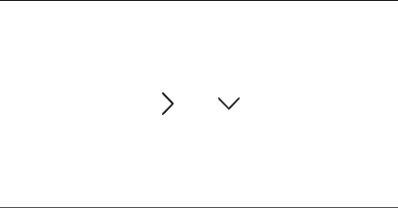

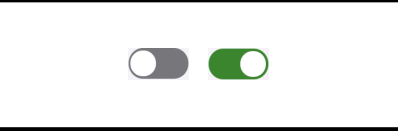


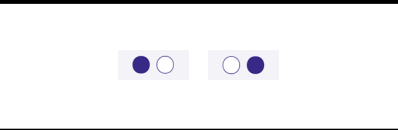

Button	Description
	<p>Set value (e.g. on the start page) You can enter a specific value in the click area so that all devices have the same control value. If, for example, different control values (80%, 60%) are set for the luminaires and you tap on 50%, all luminaires switch to the control value of 50%.</p> <p>If you tap on the left or right click area, the value you are setting decreases or increases respectively in the entire effective range by one unit. If different control values are saved for the luminaires (80%, 60%, 20%) and you tap on the ☀️ button, these control values are increased by one unit (81%, 61%, 21%). This function is not available for all setting options.</p>
	<p>Set value (e.g. fade time) Tap these buttons to increase or decrease the value being set. Tap the button to change the value by one unit. Tap and hold the button to change the value, and release when the desired value has been reached. The longer the button is held, the faster the value is changed.</p>
	<p>Special feature: set the time If the time is tapped, the Set time view appears. The hours and minutes can be set separately here.</p>
	<p>Expand – collapse The arrow indicates that additional information or selection options can be displayed (e.g. devices in a group). Tap the arrow pointing right to expand the information or selection options. The arrow changes so that it is pointing down. Tap the arrow pointing down to collapse the information or selection options. The arrow changes so that it is pointing right again.</p>
	<p>Save or confirm Tap this button to save the settings or confirm a message.</p>
	<p>Option not selected – option selected (single choice) This button marks multiple options that are available (e.g. different types of date groups), from which only one can be selected. As soon as an option for a switch is selected, all other switches change to the other option accordingly.</p>
	<p>Option not selected – option selected (multiple choice) This button marks multiple options that are available, from which multiple options can be selected. As soon as an option is selected, it is highlighted.</p>
	<p>Setting not selected – setting selected If an empty button is tapped, the button is marked with a purple background. One or more control elements (such as sliders) appear below.</p>
	<p>Switch between individual pages of the app overview The number of points corresponds to the number of the pages in the app overview. The point filled in with colour indicates the page currently being displayed. Tap an empty point to go to the corresponding page.</p>
	<p>Tap the logo to access the Information view. This page contains manufacturer information, the reference number and version of the web application and information on the licences used.</p>

Table 3: Navigation principles

5 sceneCOM and REST API & MQTT

External system connection options

sceneCOM offers the possibility of accessing device information and services of *sceneCOM* via an external system. It is possible to read out and also set properties when doing this.

sceneCOM generally behaves as a passive subscriber, which sends status information either once upon request (REST API) or based on events (MQTT). *sceneCOM* cannot actively recall or modify any properties or functions of other systems. Only area and device information for the local control device can be polled.

Access to the REST API and MQTT interface is managed via tokens. Up to 8 tokens can be used per *sceneCOM*. With *sceneCOM infinity* an access token only has to be generated on one *sceneCOM*, as all Infinity system data is available this way.

Information available via REST API and MQTT

The new **REST API & MQTT** app gives users access via REST API and MQTT. The following data and functions are available:

- Poll data as needed:
 - Poll information on all effective ranges (room or group)
 - Poll information on specific effective ranges
 - Poll device information that is listed in the *YAML* file
- Execute functions via REST API:
 - Recall scenes
 - Lighting: adjust intensity, colour temperature and colour
The current control value (intensity) can also be saved as a scene if the scene has already been created and daylight linking for this scene is not active.
 - Control motors (blinds, windows and screens)
- Subscribe to events via the MQTT interface to track changes to values

Poll/subscribe via REST API and MQTT

Thanks to a universal model, it is possible to poll/subscribe to both REST resources and hierarchies of MQTT events. Some examples are provided in the following:

- Poll/subscribe to all area information for rooms and groups:
 - REST resource: **/zones**
 - MQTT event: **/zones/#**
- Poll/subscribe to specific area information for a room or a group:
 - REST resource: **/zones/[area ID]**
 - MQTT event: **/zones/[area ID]/#**

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- Poll/subscribe to all device information for a certain area:
 - REST resource: **/zones/[area ID]/devices**
 - MQTT event: **/zones/[area ID]/devices/#**
- Poll/subscribe to device information for a specific device:
 - REST resource: **/zones/[area ID]/devices/[device ID]**
 - MQTT event: **/zones/[area ID]/devices/[device ID]/#**
- Poll/subscribe to a service for a specific device:
 - REST resource: **/zones/[area ID]/devices/[device ID]/services/[service designation]**
 - MQTT event: **/zones/[area ID]/devices/[device ID]/services/[service designation]/#**
- Poll/subscribe to information for global services:
 - REST resource: **/global/services/[service designation]/[service property]**
 - MQTT event: **/global/services/[service designation]/[service property]/#**

YAML file

The *YAML* file contains an overview of all commands and responses which you can use to control *sceneCOM* via the REST API and MQTT. The supplied test interface can be used for test purposes:

https://[IP address]/docs/rest

The currently valid version of the *YAML* file can also be downloaded onto this test interface.

Requirements for using the REST API and MQTT interface

— For REST API and MQTT, the following network ports must be open:

Interface	Service	Network port	Protocol	Comment
REST API	HTTPS	443	TCP	
REST API	HTTP	80	TCP	If HTTP access is allowed
MQTT	MQTT	8883	TCP	

Table 4: Network requirements for REST API


— Since *sceneCOM* uses a self-signed certificate, this certificate cannot and must not be verified by the MQTT client. In order to allow a connection via HTTP in *sceneCOM*, the option must be enabled in the network settings.

— The device designation must be set in the network settings.

5 sceneCOM and REST API & MQTT

Configuring the REST API in sceneCOM

The following steps are required:

- Step 1: Create a consumer.
Path: App overview > **REST-API & MQTT** > **New API consumer**
For more information see Section [Editing consumers](#)¹²
- Step 2: Copy the API token.
Path: App overview > **REST API & MQTT** > 

6 Configuration

This section explains how to configure REST-API and MQTT.

6.1 Overview of the “REST API & MQTT” app

The following gives an overview of the functions in the REST API & MQTT app.

Path: App overview > REST API & MQTT

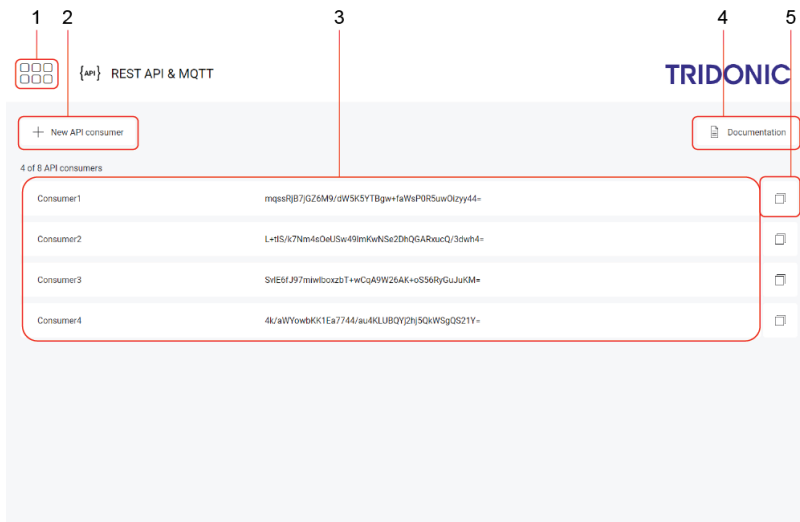


Figure 1: View of the "REST API & MQTT" app

	Function	Brief description
(1)	Return to app overview	The app overview can be accessed via this button.
(2)	Create new API consumer	Tap this button to create a new API consumer.
(3)	Active API consumers	Previously created API consumers are displayed including API token. Tap on a consumer to edit or delete it.
(4)	Opening the REST API documentation portal	Tap the button to open the REST API documentation portal at the following address: https://[IP address]/docs/rest/
(5)	Copy API token	Tap this button to copy the API token for authentication.

Table 5: Functions in the "REST API & MQTT" app

i **Note**
A maximum of 8 API consumers with the respective tokens can be created.

6 Configuration

6.2 Editing consumers

In order to access the REST API for *sceneCOM*, consumers must be created. A maximum of 8 consumers can be created. For each consumer, an automatic API token is generated.

Path: App overview > **REST API & MQTT**

Creating a new consumer

1. Navigate to the path.
2. Tap the **New API consumer** button.
 - The **New API consumer** view is displayed.

3. Enter the consumer name.
4. Tap the **Create** button.
 - The new consumer is created.
 - The API token is automatically generated.
 - The **REST API & MQTT** view is displayed.
 - The new consumer and the API token are displayed.

Editing consumers

1. Navigate to the path.
2. Tap the consumer to be edited.
 - The **API consumer** view is displayed.
3. Edit the consumer name.
4. Tap the **Save** button.
 - The settings are saved.

6 Configuration

Deleting consumers

1. Navigate to the path.
2. Tap the consumer to be deleted.
 - The **API consumer** view is displayed.
3. Tap the **Delete** button.
 - A confirmation prompt is displayed.
4. Tap the **Delete** button.
 - The consumer is deleted.
 - Existing connections to the REST API are ended.

Copying API token



1. Navigate to the path.
2. Tap the button.
 - API token is copied to the clipboard.

– or –



2. Tap the consumer whose API token you want to copy.
 - The **API consumer** view is displayed.
3. Tap the button.
 - API token is copied to the clipboard.

6 Configuration

6.3 REST API documentation portal

The REST API documentation portal provides assistance when using the REST API. Since new functions are continuously being activated via the REST API, it is always worth referring to the version in the documentation portal. With each new version, a new version of the *YAML* file is also available.

The documentation portal can be accessed via the following IP address: **https://[IP address]/docs/rest/**

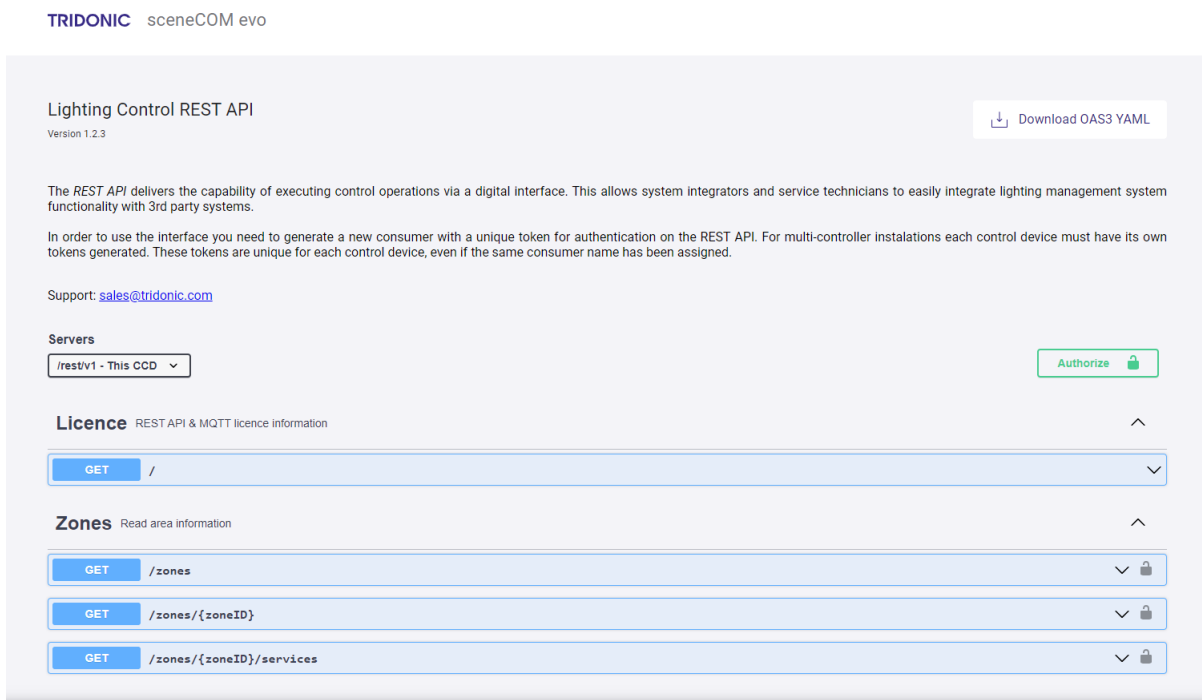


Figure 2: REST API documentation portal view

The documentation portal offers the following functions:

- version numbers to show function upgrades
- download of the currently valid *YAML* file
- overview of all available resources for the REST API
- application notes including input parameters for using the REST API
- possible responses for each query including status codes and values
- checking queries on the control device

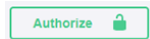
6 Configuration

Authenticating consumers

Requirements:

- Consumer has been created.
- API token has been copied.

Procedure:

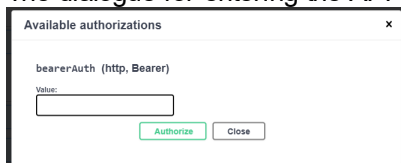


1. Open REST API documentation portal.
2. Tap the button.

– or –



2. Tap the icon for the corresponding application.
 - The dialogue for entering the API token is displayed.



3. Enter API token.
4. Tap the **Authorize** button.
 - The API token is stored for the authentication.
 - The applications are available.

i	<p>Note</p> <p>This authentication process must be carried out each time the documentation portal is accessed.</p>
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6 Configuration

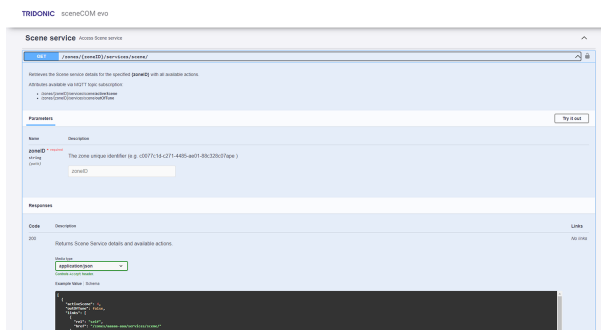
Testing 'GET' applications

Requirement:

- Consumer has been authenticated.

Procedure:

1. Bring up the application to be used by tapping the **GET** button.
 ➔ A description of the application and possible responses are displayed.



Try it out

2. Tap the button.
3. Enter area ID.
4. Tap the **Execute** button for the query to be tested.
 ➔ The query is sent.
 ➔ The responses and relevant values are displayed.

6 Configuration

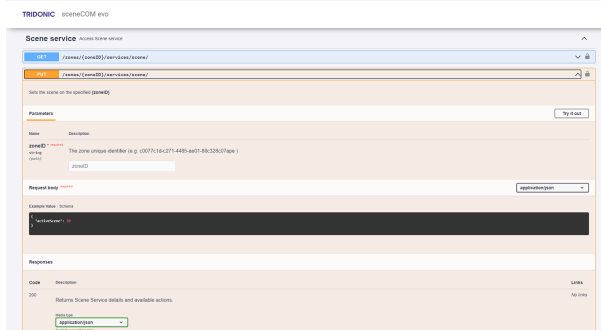
Testing 'PUT' applications

Requirement:

- Consumer has been authenticated.

Procedure:

1. Bring up the application to be used by tapping the **PUT** button.
 ➔ A description of the application and possible responses are displayed.



Try it out

2. Tap the button.
3. Enter area ID.
4. The command to be tested can be adjusted under **Request body**.
5. Tap the **Execute** button.
 ➔ The command is sent.
 ➔ The responses and relevant values are displayed.

6 Configuration

6.4 Testing the MQTT interface using MQTT Explorer

Events can be subscribed to using an MQTT Explorer. Users are then kept informed via instant status messages and only receive the information they actually need. This reduces data traffic, thus ensuring that the API is not overloaded with queries. Any MQTT Explorer can be used and users can subscribe to individual or multiple events.

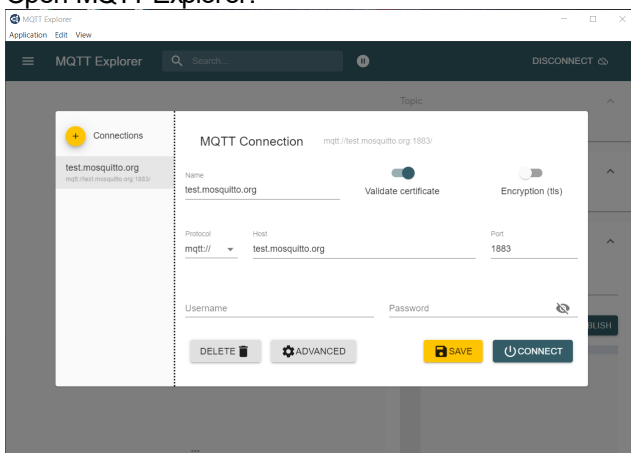


Note

In order to prevent any loss in performance, it is best not to subscribe to change all devices via a wildcard in the case of *sceneCOM* systems with lots of control devices.

Establishing a connection using MQTT Explorer

1. Open MQTT Explorer.

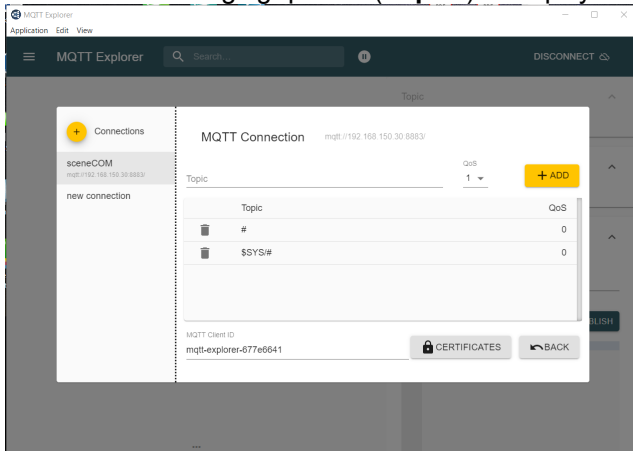


2. Disable **Validate certificate** option.
3. Enable **Encryption** option.
4. Select **mqtt://** log.
5. Under **Host**, enter the IP address of the preferred *sceneCOM*.
6. Enter port **8883**.
7. Enter the consumer name as the user name.
8. Enter the API token as the password.

6 Configuration

9. Tap the **ADVANCED** button.

➔ Overview for managing queries (**Topics**) is displayed.



10. Under **Topic**, subscribe to the desired events; the wildcard **/#** at the end of an event indicates all changes for the elements of the selected area (e.g. **zones/#**).

11. For “Quality of Service” (**QoS**), you can select the quality of the update transmissions.



Note

There are three **QoS** levels to choose from:

- Level 0: the information is transmitted no more than one time when a value is changed.
- Level 1: the information is transmitted at least one time when a value is changed.
- Level 2: the information is transmitted exactly one time when a value is changed.

12. Tap the **ADD** button.

13. Events (**Topics**) that are not required can be deleted using the rubbish bin icon.

14. Tap the **BACK** button to return to the connection overview.

15. Tap the **SAVE** button to save the settings.

16. Tap the **CONNECT** button.

➔ A connection is established via MQTT.

Subscribing to an individual event

In order to subscribe to an individual event, the full path must be entered.

For example:

- Subscribing to a change of scene in a room or a group:
zones/[area ID]/services/scene
- Subscribing to a change in the intensity of a device:
zones/[area ID]/devices/[device ID]/services/lighting/intensity

6 Configuration

Subscribing to multiple events

Wildcards can be used to subscribe to multiple events.

Wildcard for an individual level: **+**

For example, subscribing to a change of scene for all devices in a room or a group:
zones/[area ID]/devices/+ /services/sceneDeviceService/scene

Wildcard for multiple levels: **#**

For example, subscribing to all changes for all devices in a room or a group:
zones/[area ID]/devices/#