

Application Note

Operating the SmartDirector App

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Summary

This document describes how to use the functions provided by the SmartDirector App.

For further information about Smart Office facilities, standards, parameters and options please refer to the chapter "SmartOffice" in [1] (see page 2) .

Glossary

Terms, acronyms and abbreviations used in the document.

Term	Description
App	SmartDirector App
GUI	Graphical User Interface
MQTT	Message Queuing Telemetry Transport
PWM	Pulse Width Modulation
REST Interface	Representational State Transfer

Information available from the MICROSENS Website

Registered users can find the latest firmware versions as well as further information on our web site:

- Registration: www.microsens.de > Login > Follow the link 'Not registered?' > Fill in the opening email form and submit it to MICROSENS.
 - You will receive an email from MICROSENS with a user name and a password
- Login: www.microsens.de > Login > Enter user name and password > Click the 'Login' button
 - Firmware images: Navigate to the device and select the tab 'Services'
 - For further information select one of the other tabs

Note:

Make sure the browser allows the execution of scripts.

Note:

After updating the firmware either by Web Manager or CLI be sure to clear the cache of the browser you are using to open the Web Manager of the respective device. This will force the browser to reload the device's updated web GUI data instead of using the outdated data from its cache.

Bibliography

[1] Product Manual Firmware Generation 6

This manual is included in each software archive containing Firmware G6. It can also be downloaded from the link "Documentation" in the firmwares' Web Manager navigation bar.

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Typographical Conventions

The following typographical elements are used in this document:

Typographical Elements	Explanation
•	List element, 1 st order
○	List element, 2 nd order
www.microsens.de	Hyperlink to a website or email address
Note:	A note tags an important fact
□	Work step
<...>	Placeholder for a real value. Replace <IP Address> with e.g. 192.168.1.2.
{... ...}	Choose one of the values offered, e.g. from {Disabled Enabled}, choose Enabled.
Visualisation	A string that appears in the Web Manager
Command	A string to enter in the Command Line Interface
» Output	A string output by the Command Line Interface
	Work step(s) in the Web Manager (GUI)
	Work step(s) in the Command Line Interface (CLI)

1 Introduction to SmartOffice

The SmartOffice concept is used to control lighting, shades, network access and other office aspects using a Microsens G6 switch or CSLC multichannel light controller.

Local operation is facilitated using buttons (wireless or cabled) and sensors from various vendors and via a programmable graphical user interface (GUI) displayed on a tablet/phone (web page). The interaction between all elements is programmed using the microScript language.

All this is provided by an installable app package and called "SmartDirector".

2 Basics

The SmartDirector App (in the following context simply called the "App") has two main functional blocks:

- Commissioning: Configuration of the SmartOffice firmware
- Operating: Handling of user inputs and actor/sensor manipulation

2.1 Commissioning

The App is closely coupled to the MICROSENS SmartOffice functionality provided by the G6 system. This G6 firmware provides several vital aspects that need to be configured for each specific use case. The App offers a more convenient way to perform these configuration tasks.

In particular this includes:

- Defining the user web interface which forms the web/tablet interface through which the user controls his lights, heating etc. The MICROSENS G6 firmware just provides the building blocks to create the interface (items like buttons and sliders) but the actual definition of how many buttons appear on a specific page and what they are actually doing is all configured by the App.
- The G6 System provides device drivers to interface with various vendors or technologies like MQTT, or MICROSENS light and I/O controllers. Again, the App creates instances of such elements, names them and provides the logic that results in interaction of sensors and actors. Without the App, these elements just would collect sensor data but with no resulting action.

In order for the SmartDirector App to perform the configuration task, a number of parameters must be provided by the user (installer) at commissioning time. These include basic data such as the number of rooms and lights in a certain area.

The SmartDirector App version 100 and newer offers the option to preset two typical application scenarios ("MVP-1" and "MVP-2"). The preset configures the App and some controller functions, so the whole setup is done in two easy steps (see section 4 on page 8).

2.1.1 Difference to Typical Home User Applications

Typically, in a private home setup new lights are assigned to the system when they are connected. The operator afterwards decides what action they should perform.

The SmartDirector, on the other hand, is designed for pre-planned applications, like offices or hotel rooms, where the required lighting installation is planned ahead. Therefore, this information can be entered into the App and then the required drivers for this environment

are created right away, even if the actual installation of the hardware will come at a later time. This decouples software and hardware commissioning to a large degree. It also enables the preset of a system without actually having the elements at hand.

In the private home logic, it is not possible to plan ahead and create logic for elements that are not existing yet.

2.2 Operating

Once the commissioning is done, that is the sensors and actors are defined and connected and the graphical user interface (GUI) for the user has been configured, the operational phase begins.

Here the App acts as the brain of the installation. Let's look at a simple example to clarify this.

We assume a physical push button is pressed. The underlying G6 firmware will call the App indicating which button was pressed. Now the App checks its own setup to see which action should be performed. Typically a predefined scene will be requested. The App now finds the associated scene definition and will inform all related actors to execute their assigned tasks. In our example it will turn on certain lights to certain brightness level. The underlying system, in turn, will take care of actually writing the required data in the respective format to the associated elements. So the logic and the I/O activity is decoupled.

All logic, i.e. which lights, blinds, I/O etc. are affected, is fully flexible by the underlying G6 system. The App makes a useful logic out of this flexibility.

Because the App is programmed in a simple script language (that needs no compilation), it is possible to quickly adapt this logic, if required, without the need to change the device firmware of the underlying G6 system. Therefore, customer specific changes do not compromise the overall system quality and are easily done outside of a rigid firmware release cycle.

However, with increasing complexity incorporated into the App itself, it becomes necessary to view the SmartDirector as a release controlled software on its own.

It is possible to extend standard features by adding user scripts. These can, for example, be executed when a scene is invoked.

3 Installing SmartDirector App

3.1 Prerequisites

- In order to use the previously mentioned quick start scenarios "MVP-1" and "MVP-2" it is essential to install SmartDirector App V100 with MICROSENS G6 firmware version 10.7.7 and newer.
 - Download the latest G6 firmware version from the MICROSENS website.
 - Contact MICROSENS to obtain the latest SmartDirector App.
- The SmartDirector App is intended to work with MICROSENS G6 switches or MICROSENS devices containing G6 switches (e.g. MICROSENS Central Smart Lighting Controller).
- Must have administrative rights are a pre-requisite to install the SmartDirector App.

3.2 Installation

Using the Web Manager:

- Open the Web Manager of the respective switch.
- Select the screen **Scripting**, then open the tab **APPs**.

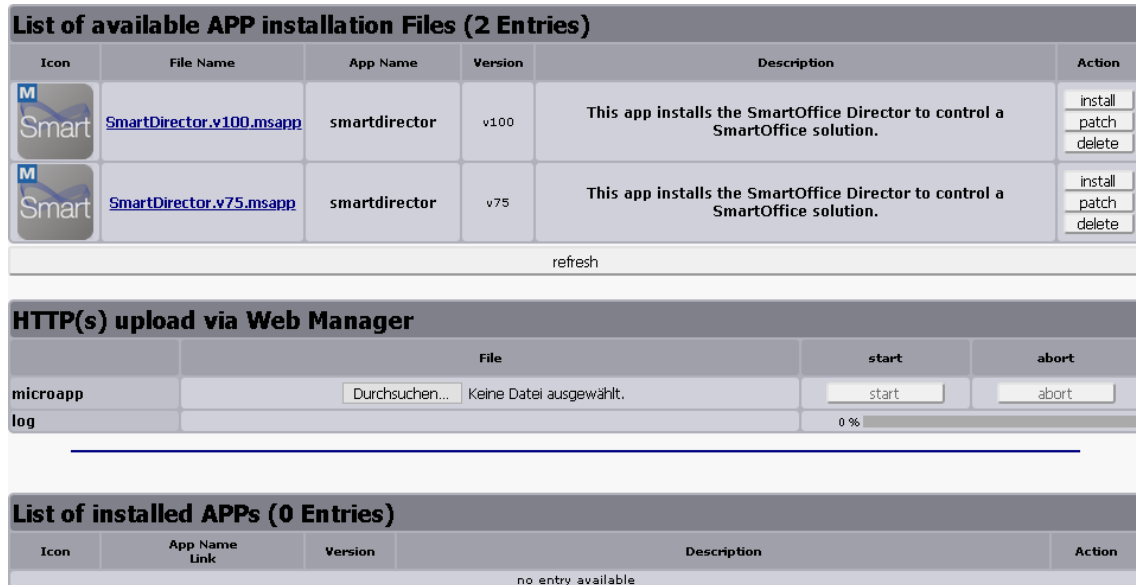


Fig. 1: Web Manager - Scripting - APPs

- Make sure at least SmartDirector App version 100 ("SmartDirector.v100.msapp") is listed in the section **List of installed APPs**.
- If App version 100 or newer is missing, search for the App in the section **List of available APP installation Files** as it may be uploaded previously.
 - » If the installation file is available, click on the button **install** of the respective app entry.
- If the installation file is not yet available, upload the App in the section **HTTP(s) upload via Web Manager** to the G6 device.
 - » Click on the button **Browse** to search for the App installation file in the local file system.
 - » After selecting the installation file click on the button **Start** to start the file upload process.
 - » A green progress bar indicates the actual status of the upload process.
 - » As soon as upload is complete the App installation file is listed in the section **List of available APP installation Files**.
 - » Click on the button **install** of the respective app entry to start the app installation process.
 - » After the installation the App appears in the section **List of installed APPs**.

List of installed APPs (1 Entry)				
Icon	App Name Link	Version	Description	Action
	SmartDirector	v100	This app installs the SmartOffice Director to control a SmartOffice solution.	<input type="button" value="deinstall"/>

Fig. 2: Web Manager - Scripting - APPs - Installed Apps

Note:

The installation script for the newer App version automatically uninstalls a previously installed older version app. It is not necessary to uninstall the existing app manually.

- » After the successful app installation a new tab **SmartDirector** appears on the screen **Scripting**.

App.smartdirector.about	
Parameter	Value
name	SmartDirector
display name	SmartOffice Director Application
version	100_rc3
creation date	2020-02-24
app id	1020
min firmware version	10.7.7
license free	<input checked="" type="checkbox"/>
description	This app installs the SmartOffice Director to control a SmartOffice solution.
developer	Eric Hoedt, MICROSENS GmbH

Fig. 3: Web Manager - Scripting - SmartDirector

4 Quick Start Scenarios

SmartDirector App version 100 and newer offers the option to preset two typical application scenarios. The preset function of the App configures the App and some controller functions, so the whole setup is done in two easy steps.

- **MVP-1: Room Automation**
 - Expects 1x PLM + 1 or 2 Smart-IO-Controller(s)
 - Up to 12 LED lights in 4 zones
 - Configures:
 - 4 light zones with 4 lights each
 - 2 blinds zones
 - 8 push buttons for blinds or lights control
 - 1 climate zone

- **MVP-2: CSLC based Professional Lighting System**
 - Expects 1 or 2 Central Smart Lighting Controllers (CSLC)
 - Up to 24 LED lights in 6 zones
 - + 12 LED cold/warm LED in 3 zones
 - Configures:
 - 9 light zones
 - no blinds zones
 - no push buttons, but possible with additional SIO
 - no climate control

As mentioned before, the SmartDirector is designed for pre-planned applications. Because of this it is not necessary to attach the expected actors and sensors to the network before starting the preset process.

Note:

For more information about the quick start scenarios "MVP-1" and "MVP-2" see the respective Quick Start Guide "Using Quick Start Scenarios MVP-1 and MVP-2".

4.1 Prerequisites

- In order to use the quick start scenarios "MVP-1" and "MVP-2" it is essential to install SmartDirector App V100 with MICROSENS G6 firmware version 10.7.7 and newer.
 - Download the latest G6 firmware version from the MICROSENS website.
 - Contact MICROSENS to obtain the latest SmartDirector App.
- The SmartDirector App is successfully installed to a MICROSENS G6 switch or a MICROSENS device containing a G6 switch (e.g. MICROSENS Central Smart Lighting Controller).
- Must have administrative rights are a pre-requisite to use the preset function.

4.2 Presetting the Quick Start Scenarios

Using the Web Manager:

- Open the Web Manager of the respective switch.
- Select the screen **Scripting**, then open the tab **SmartDirector**.
- In the section **App.smartdirector.quick_start** click on the respective scenario button **preset mvp 1** or **preset mvp 2**.

Parameter	Value
clear all	clear all
preset mvp 1	preset mvp 1
preset mvp 2	preset mvp 2
apply configuration	apply configuration
update configuration	update configuration

Fig. 4: Web Manager - Scripting - SmartDirector - Preset MVP-1/MVP-2

» This will preallocate the respective parameters with the specific preset values. To use these values either click on the one of the following buttons:

- Click on the button **apply configuration** to delete all existing configuration settings and use only the preset values from the selected quick start sceneario.

Note:

It is recommended to save the existing SmartOffice configuration before applying the preset configuration.

- Click on the button **update configuration** to add the new preset values to the existing configuration.
- In case of returning to the previous configuration click on the button **clear all** and reload the previously saved SmartOffice configuration.
- After successfully applying a quick start sceneario add some or all of the necessary devices, sensors and actors to test the new configuration.

5 Operating the SmartDirector App

5.1 Separate SmartDirector App Web Interface

The SmartDirector App can be configured via CLI, Web Manager and NMP. At this level the operator has full access to all system parameters.

In some cases it is desirable that the operator setting up the SmartDirector does not have access to other parameters related to the underlying G6 system (VLAN, IP, etc). For these cases a special web interface is provided that only displays parameter of the SmartDirector App but not the rest of the G6 system.

For the benefit of such users some basic information is duplicated in the App to be able to still get access:

- Get and set time and date
- View IP address and gateway
- Perform configuration backup and restore
- View devices
- Identify devices

- Pair and unpair devices
- Restart devices

5.2 Access to SmartDirector App Web Interface

5.2.1 Using the Web Manager

- Open the Web Manager of the respective switch.
- Select the screen **Scripting**, then open the tab **APPs**.
- In the section **List of installed APPs** click on the entry "SmartDirector".


List of installed APPs (1 Entry)				
Icon	App Name Link	Version	Description	Action
	SmartDirector	v100	This app installs the SmartOffice Director to control a SmartOffice solution.	<input type="button" value="deinstall"/>

Fig. 5: Web Manager - Scripting - APPs - Separate Dialogue

» A new browser window opens with the SmartDirector start page.

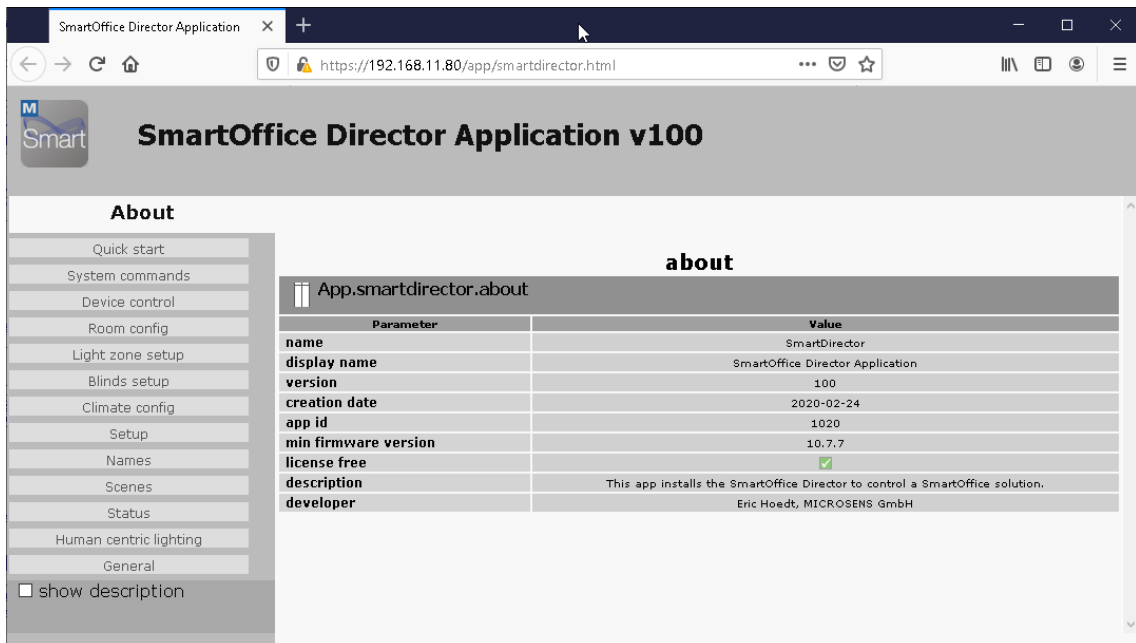


Fig. 6: SmartDirector App - Separate Browser Window - Start Page

- To expand the view on additional parameter information check the option **show description**.

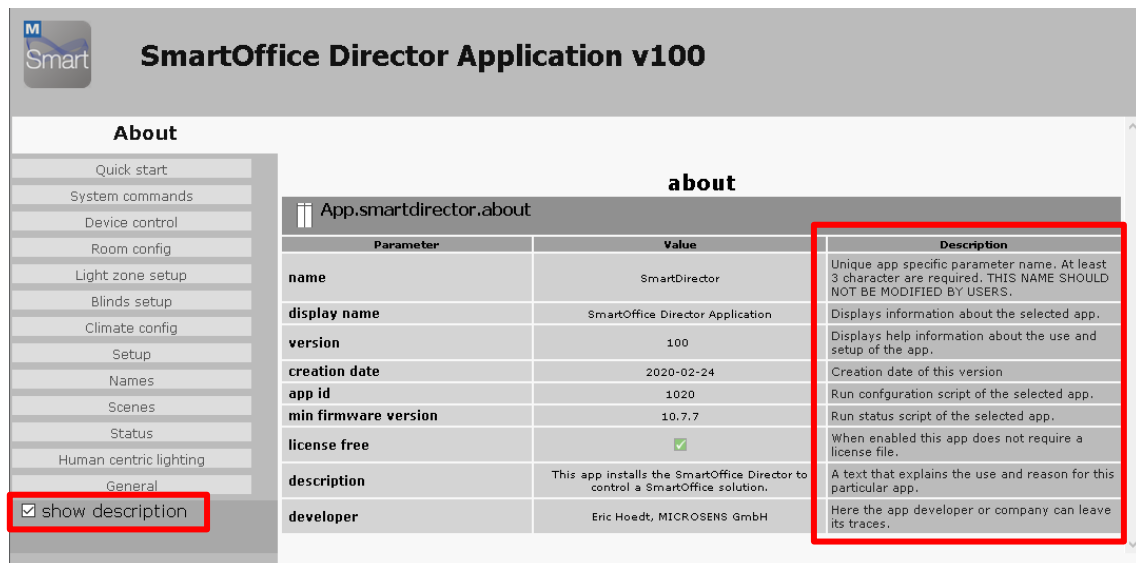


Fig. 7: SmartDirector App - Separate Browser Window - Start Page - Description

Note:

For more information about specific SmartDirector dialogues please refer to the chapter "SmartOffice" in [1] (see page 2).

5.2.2 Using direct Link

Without using the G6 Web Manager it is possible to open the SmartDirector App web interface with its direct address:

- [http\(s\)://<G6 IP address>/app/smartdirector.html](http(s)://<G6 IP address>/app/smartdirector.html)

The operator has to login with his credentials. Depending on his access level rights he is able to manage the SmartDirector settings or just view the status of devices, sensors and actors.

5.3 Operational Functionality

As stated before, the SmartDirector App can be tailored to the needs of a particular environment. The following feature summary describes the standard. All features are accessible via Web Manager GUI or the separate SmartDirector browser window.

5.3.1 Scenes

Scenes form a fundamental element of the App. There are numerous ways to select a scene. A scene can modify almost all settings of the room. A typical scene only changes some aspects while others are not affected.

Changes to the scene presets become effective as soon as the scene is applied the next time.

- **Light zones, light actions and light color**

Any number of light zones can be set at once. It is possible to set dimlevel and hue (color of the light if supported by hardware). All values can be the same or individual.

Autodim can be started/stopped for the zone(s).

- **Blinds zones, blinds actions and blinds position**

Any number of blind zones can be set at once, provided they require the same action.

It is possible to set position or to move/stop/tilt the blinds.

The blind position settings can be different for each zone within the same scene.

- **Devices**

Any or all devices connected to switchable power outlets can be turned on or off individually.

The power outlets are controlled using enOcean devices.

If these support power reading, their power consumption is recorded.

- **Extended Functions**

Another scene can be called ("chained scene") to also invoke these settings at once. This may be used to when light scenes should change together but to complicated settings not possible in a single scene.

A user script can be called. This script can be used to perform any other task such as changing a temperature or sending an MQTT message.

The script functionality is very versatile. Separate documentation is available on this subject.

5.3.2 Scene Invocation

A scene can be invoked (called up) via many ways:

- Scene button on the GUI (tablet/web)
- Physical push button (i.e. a button can be configured to call scenes in a sequence for each push to implement toggle or cross-switch functions)
- At startup
- After a long (programmable) time once motion occurs again
- Via MQTT topic (from another system)
- Via REST Interface (from another system)
- From a script

5.3.3 Rooms

The logic of a room is used to present individual GUI home pages for each room. The assumption is that every physical room may have a dedicated control tablet (e.g. mounted on a wall) or at least an occupant with his mobile phone or tablet. On that tablet only scenes that affect that room should appear. In the scene configuration it is possible to assign a scene to a room for that purpose.

Also light zones can be mapped to a room. This is needed to determine when a room is vacant (when all associated light zones detect idle for some time)

Up to 12 rooms may be defined.

Note:

Default and quick settings define just one room.

5.3.4 Light Zones

The App can control up to 12 independent light zones. A light zone contains any number of lights (within system limits like maximum power consumption) that should perform the same actions together. A light zone can be associated with a certain room. Several light zones may coexist in the same room.

Note:

A light zone cannot be part of two rooms!

For example a room is an office with 3 employees. Each one may have its own light(s) associated and can keep its own automatic (or manual) light level.

When no motion activity is detected the light zone dims down (to 0 or another preset value) to save energy. The timeout value is independent for each zone to accommodate different room uses. (1min to 12 hours in several steps)

5.3.5 Autodimming

Each light zone can independently use automatic dimming which aims to keep the brightness on a constant level when it gets dark outside.

The autodim feature can be combined with human centric lighting. This means that the overall brightness is lowered in the morning and evening and the light color is shifted toward warm at the same time. This logic follows a sine wave.

Parameters include:

- Autodim target level

Note:

This is not a calibrated Lux value but rather a unitless perceptive setting, because most sensors provide non calibrated values. Moreover the physical location of the sensor (ceiling, wall, desk) as well the colors in the room strongly affect the measured value.

- Begin and end hour of human centric light curve
- Dimlevel boundaries. Usually the light is controlled between 0% (off) and 100%. In some cases a minimum light level from the lighting is desired. Lower and upper limit can be set.
- Motion detection can be combined with auto dimming.

5.3.6 Motion Detection

As long as no motion is detected for a definable time, light zones can be dimmed down. A limit can be set, so that a minimum light level is maintained.

All settings are independent for each light zone.

Several motion sensors can be combined.

All zone motion information may be combined to a global motion information. In this case all zones turn on/off together.

If the motion of a zone was inactive (idle) for a globally definable time, a start scene can be invoked on motion. This is intended as welcome scene for the next morning.

Note that currently the start scene is global not zone specific.

5.3.7 Physical Buttons

The App can theoretical use any type of button. In practice the G6 system supports enOcean and buttons connected to digital input pins of the Microsens Smart IO Controller.

Up to 8 button devices, where each device can have up to 6 individual push buttons, are supported by the App.

Each button can be mapped to call a scene or a sequence of scenes.

It is also possible to link buttons so that if one button is pressed a push on the linked button will also call the next sequenced scene. This is useful where several buttons in a room should work in the same way regardless which one is pressed.

Note:

HomeMatic devices are not supported.

5.3.8 Climate Control

One climate zone can be defined.

For each zone the parameter can independently be defined.

The regulation can take place in an external enOcean thermostat or can be controlled internally in the app.

When internal regulation is selected, a script based PLC is used which performs regulation using a PID regulator. Three different dead zones can be defined and a manual override is provided.

A "window open" sensor can be configured to switch of heating automatically.

A dew point sensor can be connector to automatically switch off cooling.

A PWM output (for a heat mat) and 0-100% outputs for valves are available.

5.3.9 Names

Names can be assigned to:

- Light zones
- Blind zones
- Devices
- Rooms

Icons can be assigned to scenes.

Main screen logo can be assigned (default Microsens).

5.3.10 User System Access via GUI

For a standard user (not operator) it is usually not possible to modify system aspects. In order to offer some degree of control to the user, a passcode can be provided via tablet or mobile phone which enables access to further web pages in the public GUI.

The passcode is a number that can freely be configured in the App.

These extra web pages permit to redefine icons and to modify scene values via the user GUI. It is also possible to change the autodim target level here.

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With the passcode access it is also possible to reboot the device via the GUI. (with extra warning) This is provided as an emergency reboot in case of severe malfunction.

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