

Quick Start Guide

Commissioning the Smart Lighting Controller

V0.0.7



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0 Aim of this Quick Start Guide

This quick start guide will help you with

- the mechanical handling of the Smart Lighting Controller,
- connecting the power supply via PoE+ and commissioning the device,
- reset the device,
- connecting the signal cables (inputs and outputs),
- and setting up access to the network management.

For further information see the Web Manager of the managing MICROSENS switch or visit the MICROSENS website.

Note:

Make sure to connect all components (LED light, Smart Sensors) only to an unpowered Smart Light Controller! Otherwise the components or the controller could be damaged due to uncontrolled voltage spikes!

1 Interfaces and Operating Elements

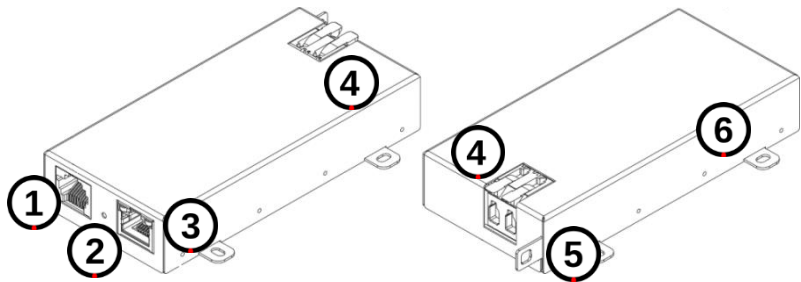


Figure 1: Interfaces

1 Smart Sensor port RJ-45, unshielded proprietary	2 Reset button	3 10/100Base-TX uplink port RJ-45, shielded, Cat 5e
4 LED light connector Push-in-clamp 2x 0.2 - 4.0 mm ²	5 Chassis ground and strain relief lug for LED light connector cable	6 Mounting tabs (chassis ground)

2 Mechanical Handling

The MICROSENS Smart Lighting Controller is ready to be attached via two different mountings:

- A clamp for top hat rail mounting
- and four mounting tabs for direct attachment to wall, ceiling or any other backing equipment.

2.1 Mounting Tabs

To attach the Smart Lighting Controller directly to a wall, ceiling or any other suitable backing equipment, use the four mounting brackets (Figure 2, Pos. 1 to 4).

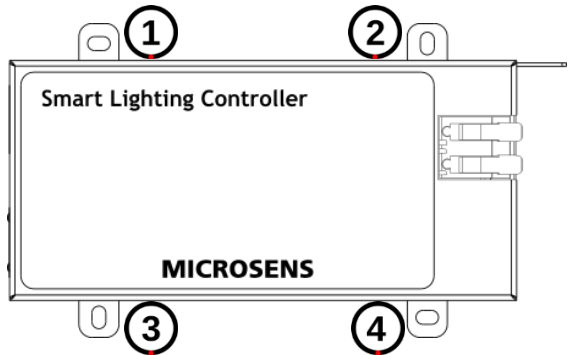


Figure 2: Mounting tabs

Note:

Make sure to secure the attachment adequately when using less mounting tabs! It is not recommended to use only one mounting tab or mounting tabs of only one side.

2.2 Top Hat Rail Mounting and Demounting

On its bottom side the Smart Lighting Controller housing (Figure 3, Pos. 1) is optionally equipped with a clamp for mounting the device onto a standard top hat rail (Figure 3, Pos. 2).

Note:

Assemble the clamp to the housing if not shipped with clamp already adapted. Be sure the clamp's release lever (Figure 3, Pos. 3) is pointing to the side with the Ethernet port (Figure 1, Pos. 3).

2.2.1 Mounting on Top Hat Rail

1. Place the housing with the clamp's stationary fixture over the top hat rail (Figure 3, Pos. 4).
2. Gently press the housing (Figure 3, Pos. 5) until the clamp snaps into the top hat rail (Figure 3, Pos. 2) with an audible click.

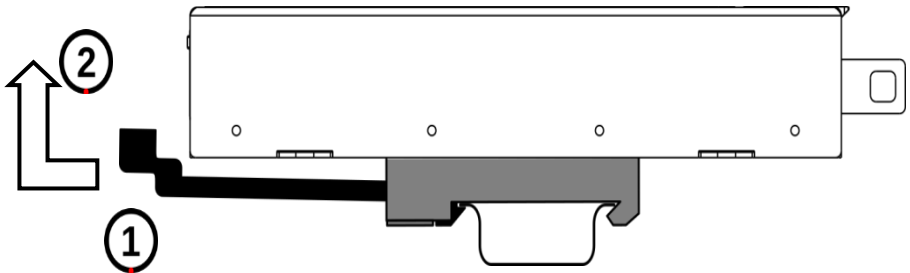


Figure 3: Top hat rail mounting

2.2.2 Demounting from Top Hat Rail

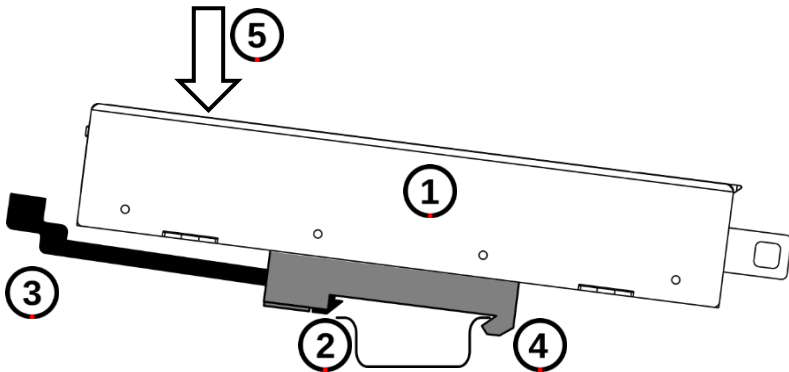


Figure 4: Top hat rail demounting

1. Pull the release lever (Figure 4, Pos. 1) to unlock the clamp and lift the device (Figure 4, Pos. 2) to remove it from the top hat rail.

3 Connecting the LED Light

Note:

Connect the LED light only to an unpowered Smart Light Controller! Otherwise the LED light or the controller could be damaged due to uncontrolled voltage spikes!

Connect the LED light cable to the push-in clamp (Figure 1, Pos. 4).

Make sure the connected LED light meets the following requirements of the interface:

- Power output: max. 28 W
 - less power depending on the number of connected Smart Sensors
 - for the used sensor's power consumption please refer to the respective data sheet
- Power supply: 20 to 50 VDC
- Current output: max. 1 A
- Cable length: max. 3 m
- Cable type: 2-wire cable, 0.2 to 4.0 mm² wire cross section

4 Connecting the Smart Sensor

Note:

Make sure to use the Smart Sensor (i.e. CAN or MICROSENS) which matches the respective SLC. A wrong combination of Smart Sensor and SLC may damage the Smart Sensor permanently! If in doubt, contact the MICROSENS support.

Note:

Connect the Smart Sensor only to an unpowered Smart Light Controller! Otherwise the sensor or the controller could be damaged due to uncontrolled voltage spikes!

Connect the Smart Sensor cable to the Smart Sensor port (Figure 1, Pos. 1).

Depending on the Smart Sensor type and the type of SLC it is possible to connect multiple Smart Sensors to the Smart Lighting Controller in series. In case of the wrong combination of SLC and Smart Sensor, the Smart Sensor can be permanently damaged.

Note:

Please refer to the technical documentation of the respective Smart Sensor regarding e.g. power consumption and bus-termination demands.

5 Connecting the Power Supply

The MICROSENS Smart Lighting Controller is supplied by PoE+ (PD) via the Ethernet port (Figure 1, Pos. 3).

Note:

Make sure to enable PoE/PoE+ PD on the powering device. For enabling PoE on MICROSENS devices please refer to the respective documentation shipped with the device.

Note:

The Smart Lighting Controller is powering a connected LED light via the PoE+ power supply with a maximum power output of 28W. Make sure that the powering PoE+ device is able to deliver a power of at least 30 W and the connecting Cat 5e Ethernet cable does not exceed the recommended maximum length of 15 m.

5.1 Grounding with PoE Supply

For the installation of PoE components in corporate networks it is necessary to reference the DC supply voltage of all devices to the same ground level. Normally this will be the **positive polarity connected to ground level** of the building's electrical system (i.e. "earth").

Assuming, powering of the Smart Lighting Controller is done via a centralised far off PoE PSE device it is important to connect the grounding lead of the controller's chassis (Figure 1, Pos. 5 or 6) to the building's ground potential and thus to avoid "floating ground" problems. Besides safety issues, a floating ground of the network can cause problems if only one component accidentally or on purpose is grounded (Figure 5).

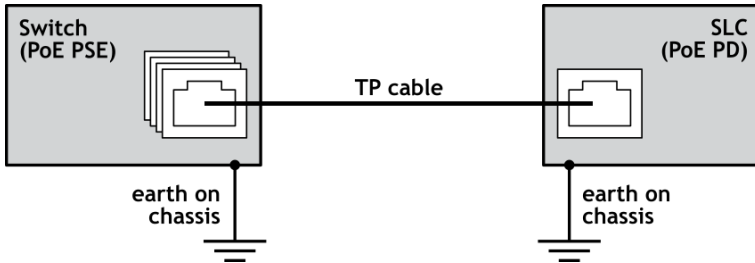


Figure 5: PoE supply with grounding

6 Reset the Smart Lighting Controller

The Smart Lighting Controller is equipped with a reset button (Figure 1, Pos. 2);

- < 2 s press: Reset the device
- > 2 s press: Switching to update mode.
If no update file is received within 20 s the device will start normally.

7 Operating the Smart Lighting Controller with MICROSENS Switches

Note:

Using MICROSENS Smart Lighting Controller is possible with MICROSENS switches containing Firmware 10.7.7b and newer. IPv6 has to be enabled.

As soon as the Smart Lighting Controller is connected to the power supply (and therefore to the corporate network) the controller is accessible via a MICROSENS switch containing the MICROSENS SmartDirector.

Note:

Because of using IPv6 link local addresses it is possible to operate a remote Smart Lighting Controller with a MICROSENS switch via the IPv6 corporate network as long as the connection is not routed.

7.1 Defining and Assigning a Function Template

The G6 switch contains configuration templates for specific controller types (in this case the Smart Lighting Controller). The template's parameter types correspond to the controller's parameters accordingly.

To change the controller's parameter from their default values, the following steps are recommended:

1. Define the controller's port functions via the G6 template in the SmartOffice screen.
2. Pair the controller to the G6 switch.
3. Restart SmartOffice on the G6 switch (disable and enable SmartOffice).

Now the controller receives the values, which remain stored permanently (even during a reset) until next change via G6 template or e.g. MICROSENS Smart Config Tool.

Note:

It is possible at all times to change the controller's settings provided by the template by restarting SmartOffice after the changes are entered.

Using the Web Manager:

- Start the web browser and enter the IP address of the respective G6 device.
- Log into the Web Manager with the administrator credentials.
- Select the **Controller** screen and then select the tab **SLC**.
- In the section **Device.controller.smartlight_config** add a new table entry for the Smart Lighting Controller (e.g. "SLC_1" as a unique name) and click on the button "+".

#	Parameter	Value
---	-----------	-------

add table entry

SLC_1

refresh apply to running configuration

Figure 6: Web Manager - Controller - SLC - Enter New Entry

- The new controller entry is created with default values assigned to its template fields.

#	Parameter	Value
1	name	SLC_1
	type	VERSION_1
	max source power	32
	max panel power	15
	manual get input	manual get input
	manual set output	manual set output
	read command	read command
	write command	write command

add table entry

unique value for name

refresh apply to running configuration

Figure 7: Web Manager - Controller - SLC - Default Values

- **Name:** The previously assigned device name.
- **Type:** Select the specific type depending on the device model.

Using the Web Manager:

- For adjusting the maximum source and panel power, select the **SmartOffice screen**, then select the **Device Configuration** tab.

#	Parameter	Value
	device name	SLC_1
	location	
	latitude	
	longitude	
	altitude	
	placement	UNSET
	product type	SMARTLIGHT_CONTROLLER
	device id	00:60:A7:09:B6:E1
	network address	
1	additional parameter	
	network failure action	KEEP_CURRENT

Figure 8: Web Manager - SmartOffice - Device Configuration - Additional Parameter

- In the section **Device.smartoffice.device_config** scroll down to the respective SLC and in the field **additional parameter** enter the values for "max_source_power=<value>,max_panel_power=<value>" in mW.
- Perform changes to the controller's configuration as needed and click on the button **apply to running configuration** to save the changes to the running configuration.

7.2 Pairing the Smart Lighting Controller and the MICROSENS Switch

The following steps describe how to pair a Smart Lighting Controller via the Web Manager of a MICROSENS switch.

Note:

For this overview primarily the use of the Web Manager is shown. Using the CLI for pairing the devices is relatively easy because the Web Manager uses the respective CLI commands as labels for fields and sections.

Using the Web Manager:

- Start the web browser and enter the IP address of the respective G6 device.
- Log into the Web Manager with the administrator credentials.
- Select the **SmartOffice** screen and then select the tab **Basic Configuration**.

domain name	general mode	act on ungrouped sensors	scan filter	scan light controllers
domain1	AUTOMATIC	<input type="checkbox"/>	SLC	scan light controllers

refresh apply to running configuration

Figure 9: Web Manager - SmartOffice - Basic Configuration - Scan Controllers

Using the Web Manager:

- In the section **Device.smartoffice.director_config** click on the button **scan light controllers**.
 - The SmartDirector starts searching for connected Smart Controllers. As long as no controller is found the section **scanned Light Controllers** stays empty.
 - After successfully scanning for available Smart Controllers the Web Manager lists all found controllers.

scanned Light Controllers (1 Entry, Filter = SLC)									
# Slt/Prt	IP address IP mode	Uptime (sec) Uptime (decoded) NW Timeout	vScan vHW vFW	Article Nr Serial Nr remote Name	Controller ID remote Director ID local Director ID	configured local Name Status	Config Actions	Pairing Actions	
1 2/3	fe80::260:a7ff:fe09:b0 static	25 0 days, 00:00:25 0	5 8 4.24	M5660102M 00855342 SLC_1	0060A709B6E10043 0000000000000000 0060A7092FB70044	unconfigured DirID not set	identify add	-	

Hint values derived from local configuration or status are marked blue.

Figure 10: Web Manager - SmartOffice - Basic Configuration - Available Controllers

- As long as no device of the suitable product type is created previously the column **Pairing Actions** of the respective Smart Lighting Controller is empty. Clicking on the button **identify** of the controller entry causes the connected LED lights of this controller to blink several times. This ensures to use the correct controller for the next steps.
- Click on the button **add** to create the respective device entry.
 - This new device entry is named "scanned_<Controller-ID>" and assigned to the product type "SMARTLIGHT_CONTROLLER".
- Select the tab **Device Configuration** and in the section **Device.smartoffice.device_config** scroll down to the formerly created entry.

Device.smartoffice.device_config (11 of 64 entries)

#	Parameter	Value
1	device name	scanned_0060A709B6E10043
	location	
	latitude	
	longitude	
	altitude	
	placement	UNSET
	product type	SMARTLIGHT_CONTROLLER
	device id	
	network address	
	additional parameter	
	network failure action	KEEP_CURRENT
	identify	identify
	restart	restart
	calibrate	calibrate
	pair	pair
	unpair	unpair
	update firmware	update firmware

add table entry

unique value for device_name

refresh

apply to running configuration

Figure 11: Web Manager - SmartOffice - Device Configuration - Added Device

Using the Web Manager:

- ☐ Change the **device name** to the name corresponding to the previously created controller (e.g., "SLC_1").
- ☐ Leave all other entries as is.
- ☐ Click on the button **apply to running configuration** to save the changes to the running configuration.
- ☐ Select the tab **Basic Configuration** and in the section **Device.smartoffice.director_config** click on the button **scan light controllers**.
 - The SmartDirector again starts searching for connected Smart Controllers. As long as no controller is found the section **scanned Light Controllers** stays empty.
 - After successfully scanning for available Smart Controllers the Web Manager lists all found controllers.

scanned Light Controllers (1 Entry, Filter = SLC)									
# Slk/Port	IP address IP mode	Uptime (sec) Uptime (decoded) NW Timeout	vScan vHW vFW	Article Nr Serial Nr remote Name	Controller ID remote Director ID local Director ID	configured local Name Status	Config Actions	Pairing Actions	
1 n.a.	fe80::260:a7ff:fe09:b64 static	494 0 days, 00:08:14 0	5 B 4.24	MS660102M 00855342 SLC_1	0060A709B6E10043 0000000000000000 0060A7092FB70044	unconfigured DirID not set	identify add	pair as SLC_1	

Hint values derived from local configuration or status are marked blue.

Figure 12: Web Manager - SmartOffice - Basic Configuration - Available Controllers

- In the column **Pairing Actions** the drop-down list offers the selection of the previously added and modified device entry.
- ☐ Select the fitting device from the drop-down list and click on the button **pair as**.
 - The Smart Lighting Controller is now properly paired to the SmartDirector of the MICROSENS G6 Switch.
 - Additionally the pairing process sets the previously empty **device id** to the correct value.

7.3 Calibration of LED Panel

The calibration of an LED panel ensures that the Smart Lighting Controller provides only the maximum current the LED panel endures.

Note:

It is important to calibrate the connected and paired LED panel before use in order to avoid damage to the panel!

The calibration process depends on which LED panel is used:

- 1-channel LED panel with anode and cathode
- 2-channel LED panel with common electrodes (i.e. both channels share the same anode or cathode)

7.3.1 Calibration of a 1-Channel LEP Panel

To calibrate a 1-channel LED panel connected to a paired Smart Lighting Controller, proceed as follows:

Using the Web Manager:

- ☐ Start the web browser and enter the IP address of the G6 device containing the Smart Director.
- ☐ Log into the Web Manager with the administrator credentials.
- ☐ Select the **Smart Office** screen and then select the tab **Device Status**.

Using the Web Manager:

- In the section **Device.smartoffice.device_information** make sure that the respective Smart Lighting Controller operates "normal".

Device.smartoffice.device_information (11 entries)		
#	Parameter	Value
1	name	SLC_1
	hardware id	0060a709b6e10043
	device type	ACTOR_SENSOR
	operational state	NORMAL
	actor attributes	LED_PANEL, RAMP_TIME, RGB_LIGHT
	sensor attributes	BRIGHTNESS, MOTION, TEMPERATURE, HUMIDITY, DEW_POINT_TEMP, CLIMATE, POWER
	vendor name	MICROSENS
	article number	MS660102M
	serial number	00855342
	hardware revision	8
	software version	5.1
	additional info	fe80::260:a7ff:fe09:b6e1 (XOR encryption)

Figure 13: Web Manager - SmartOffice – Device Status – Hardware ID/Operational State

- The Smart Lighting Controller's MAC address must correspond to the **hardware id** of the device entry.
- The **operational state** of the entry must indicate that the device is working "normal".
- Remember the **name** of the respective device.

- Change to the tab **Device Configuration**.

Device.smartoffice.device_config (11 of 64 entries)		
#	Parameter	Value
1	device name	SLC_1
	location	
	latitude	
	longitude	
	altitude	
	placement	UNSET
	product type	SMARTLIGHT_CONTROLLER
	device id	00:60:A7:09:B6:E1
	network address	
	additional parameter	
	network failure action	KEEP_CURRENT
	identify	identify
	restart	restart
	calibrate	calibrate
	pair	pair
	unpair	unpair
	update firmware	update firmware

Figure 14: Web Manager - SmartOffice – Device Configuration - Calibrate

Using the Web Manager:

- ☐ In the section **Device.smartoffice.device_config** select the corresponding device entry and click on the button **calibrate**. The calibration process starts.
 - The Smart Lighting Controller slowly increases the power output to the connected LED panel.
 - The LED panel correspondingly becomes gradually brighter until it reaches its maximum.
 - The Smart Lighting Controller determines the 100% brightness to the measured maximum power output.
- ☐ The LED panel is ready for use.

7.3.2 Calibration of a 2-Channel LEP Panel with Common Electrodes

2-channel LED panels need a Smart Lighting Controller for each channel to control both channels independently (e.g. light temperature settings for cold or warm light).

Usually, 2-channel LED panels share a common electrode (i.e. anode or cathode), connected to the respective Smart Lighting Controller and provided with a cable bridge between both controllers power output ports (see Figure 15).

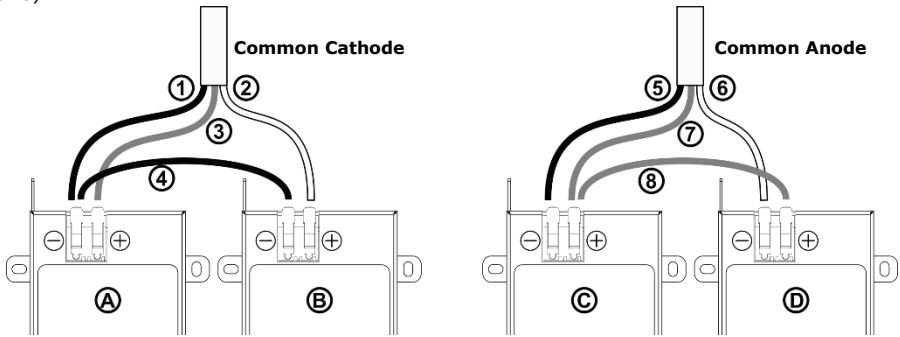


Figure 15: 2-Channel LED Panels with Common Electrodes

① Common cathode	⑤ Cathode 1
② Anode 1	⑥ Cathode 2
③ Anode 2	⑦ Common Anode
④ Cable bridge between SLC A/B (cathodes)	⑧ Cable bridge between SLC C/D (anodes)

Note:

Please refer to the LED panels's manual to detect the correct cable colors for cathodes and anodes.

It is important to physically isolate both Smart Lighting Controllers during the calibration process by using the cable bridge only after the particular calibration process is successfully finished.

Note:

When using a 2-channel LED panel with separate electrodes (i.e. one anode and one cathode for each channel), calibrate both applied Smart Lighting Controllers independently as described above.

To calibrate a 2-channel LED panel connected to two paired Smart Lighting Controllers, proceed as follows:

Using the Web Manager:

- Start the web browser and enter the IP address of the G6 device containing the Smart Director.
- Log into the Web Manager with the administrator credentials.
- Select the **Smart Office** screen and then select the tab **Device Status**.
- In the section **Device.smartoffice.device_information** make sure that the respective Smart Lighting Controllers operate "normal".

ii Device.smartoffice.device_information (11 entries)		
#	Parameter	Value
1	name	SLC_1
	hardware id	0060a709b6e10043
	device type	ACTOR_SENSOR
	operational state	NORMAL
	actor attributes	LED_PANEL, RAMP_TIME, RGB_LIGHT
	sensor attributes	BRIGHTNESS, MOTION, TEMPERATURE, HUMIDITY, DEW_POINT_TEMP, CLIMATE, POWER
	vendor name	MICROSENS
	article number	MS660102M
	serial number	00855342
	hardware revision	8
	software version	5.1
	additional info	fe80::260:a7ff:fe09:b6e1 (XOR encryption)

Figure 16: Web Manager - SmartOffice – Device Status – Hardware ID/Operational State

- The Smart Lighting Controllers' MAC addresses must correspond to the **hardware id** of the devices' entries.
- The **operational state** of the entries must indicate that the devices are working "normal".
- Remember the **name** of the respective devices.

Using the Web Manager:

- Connect the LED panel's cathode (1 or 6) to the Smart Lighting Controllers negative port (B-, D-).
- Connect the LED panel's anode (2 or 7) to the Smart Lighting Controllers positive port (B+, D+).

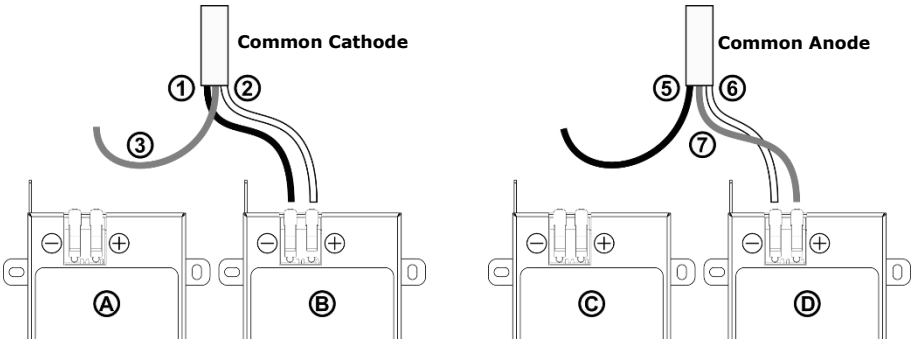


Figure 17: Calibration of a 2-Channel LED Panel - Step 1

- Change to the tab **Device Configuration**.

Device.smartoffice.device_config (11 of 64 entries)

#	Parameter	Value
	device name	SLC_1
	location	
	latitude	
	longitude	
	altitude	
	placement	UNSET
	product type	SMARTLIGHT_CONTROLLER
	device id	00:60:A7:09:B6:E1
	network address	
1	additional parameter	
	network failure action	KEEP_CURRENT
	identify	identify
	restart	restart
	calibrate	calibrate
	pair	pair
	unpair	unpair
	update firmware	update firmware

Figure 18: Web Manager - SmartOffice - Device Configuration - Calibrate

Using the Web Manager:

- ☐ In the section **Device.smartoffice.device_config** select the corresponding device entry (Smart Lighting Controllers B or D) and click on the button **calibrate**. The calibration process starts.
 - The Smart Lighting Controller slowly increases the power output to the connected LED panel.
 - The LED panel correspondingly becomes gradually brighter until it reaches its maximum.
 - The Smart Lighting Controller determines the 100% brightness to the measured maximum power output.
- ☐ Connect the LED panel's cathode (1 or 5) to the Smart Lighting Controllers negative port (A-, C-).
- ☐ Connect the LED panel's anode (3 or 7) to the Smart Lighting Controllers positive port (A+, C+).

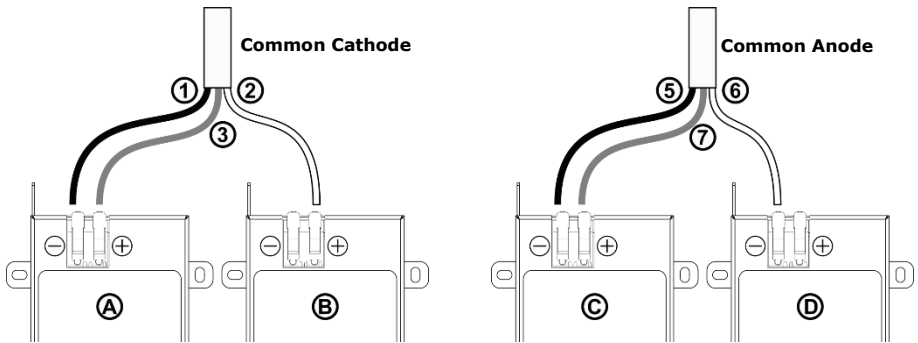


Figure 19: Calibration of a 2-Channel LED Panel - Step 2

- ☐ Repeat the calibration process described above with the Smart Lighting Controllers A or C.
- ☐ Connect the negative ports of Smart Lighting Controllers A and B with a cable bridge (4).
- ☐ Connect the positive ports of Smart Lighting Controllers C and D with a cable bridge (8).

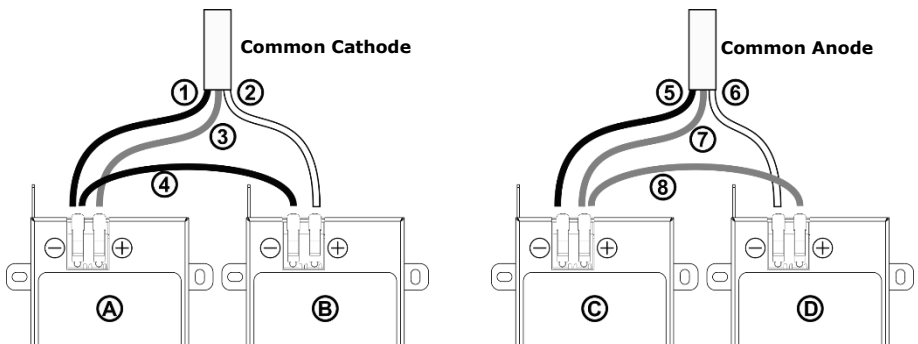


Figure 20: Calibration of a 2-Channel LED Panel - Step 3

- ☐ The LED panel is ready for use.

7.4 Functional Test of the Paired Smart Lighting Controller

After pairing the Smart Lighting Controller the Smart Director automatically generates the corresponding entries for the device and its **enabled** sensors and actors as well. The following steps describe how to test the correct pairing of a Smart Lighting Controller via the Web Manager of the paired MICROSENS switch.

Note:

For this overview primarily the use of the Web Manager is shown. Using the CLI for pairing the devices is relatively easy because the Web Manager uses the respective CLI commands as labels for fields and sections.

Using the Web Manager:

- Select the **SmartOffice** screen and then select the tab **Device Status**.
 - In the section **Device.smartoffice.device_information** there should be listed an entry for the paired Smart Lighting Controller with the device name previously assigned.

Device.smartoffice.device_information (11 entries)		
#	Parameter	Value
	vendor name	MICROSENS
	article number	MS660301M
	serial number	813050
	hardware revision	K
	software version	5.2c
	additional info	The smart device is currently not available. (16:21:42)
	name	SLC_1
	hardware id	0060a709b6e10043
	device type	ACTOR_SENSOR
	operational state	NORMAL
	actor attributes	LED_PANEL, RAMP_TIME, RGB_LIGHT
	sensor attributes	BRIGHTNESS, MOTION, TEMPERATURE, HUMIDITY, DEW_POINT, CLIMATE, POWER
11	vendor name	MICROSENS
	article number	MS660102M
	serial number	00855342
	hardware revision	B
	software version	4.24
	additional info	fe80::260:a7ff:fe09:b6e1 (no encryption)
<input type="checkbox"/> refresh values every 3 seconds		
refresh		

Figure 21: Web Manager - SmartOffice - Device Status - Smart Lighting Controller

Using the Web Manager:

- Change to the tab **Sensor Status**.

iii Device.smartoffice.sensor_list (101 entries)				
#	device	instance	attribute	associated groups
95	SLC_1	1	BRIGHTNESS	
96	SLC_1	1	MOTION	
97	SLC_1	1	TEMPERATURE	
98	SLC_1	1	HUMIDITY	
99	SLC_1	1	DEW_POINT	
100	SLC_1	1	CLIMATE	
101	SLC_1	1	POWER	

☐ refresh values every 3 seconds

refresh

Figure 22: Web Manager - SmartOffice - Sensor Status

- In the section **Device.smartoffice.sensor_list** in the column **device** there should be listed the Smart Lighting Controller with its assigned name.
 - In the column **attribute** there exists one row entry for every digital input port of the controller, named by its assigned attribute. This corresponds to the attribute assignments "Din x attribute" defined in the controller's template configuration step (see above).
 - The column **instance** incrementally counts all input ports of the respective controller, beginning with "1". Depending on the prior attribute assignments the instance number can vary from the default numbering order.
- If any sensors are connected to the Smart Lighting Controller yet, both their last actual value and their last response are shown in the status list. Scroll to the right to see those status table entries.
 - Change to the tab **Actor Status**.

iii Device.smartoffice.actor_list (13 entries)				
#	device	instance	attribute	associated groups
11	SLC_1	1	LED_PANEL	
12	SLC_1	1	RAMP_TIME	
13	SLC_1	1	RGB_LIGHT	

☐ refresh values every 3 seconds

refresh

Figure 23: Web Manager - SmartOffice - Actor Status

Using the Web Manager:

- With actors or sensors already connected to the Smart Lighting Controller it is possible to get or set values from specific ports. Select the **Controller** screen and then select the tab **SLC**.

#	Parameter	Value
1	name	SLC_1
	type	VERSION_1
	max source power	32
	max panel power	15
	manual get input	manual get input
	manual set output	manual set output
	read command	read command
	write command	write command

add table entry

refresh

apply to running configuration

Figure 24: Web Manager - Controller - SLC - Manually Get/Set Port Values

- In the section **Device.controller.smartlight_config** scroll down to the rows **read command** and **write command**.

E.g., to get the brightness value from a sensor connected to the input port enter the value "Brightness1" into the read command field and click on the button **read command**. After a short processing time the Web Manager displays the received value. The number "1" in "Brightness1" is the instance indicator and has to be entered.

E.g., to set the dim level of a connected LED panel to "100" enter the value "Dimlevel 100" into the write command field and click on the button **write command**. After a short processing time the connected LED panel lights up and the Web Manager displays a confirmation message.

7.5 Updating the Device's Firmware

The Smart Lighting Controller has its own firmware that can be manually updated via the Web Manager of a connected MICROSENS G6 switch. To update the firmware proceed as follows:

Using the Web Manager:

- Start the web browser and enter the IP address of the respective G6 device.
- Log into the Web Manager with the administrator credentials.
- Select the **Controller** screen, then select the tab **SLC** and scroll down to the bottom of the dialogue.

Using the Web Manager:

- In the section **HTTP(s) upload via Web Manager** open the browser's file selection dialogue with a click on the button "Browse":

HTTP(s) upload via Web Manager

	File	start	abort
SLC firmware	<input type="button" value="Durchsuchen..."/> Keine Datei ausgewählt.	<input type="button" value="start"/>	<input type="button" value="abort"/>
log		0 %	

available SLC firmware files on device (2 entries)

#	filename	filesize	filetime	remove
1	SL91778C_v4_24.bin	112892	2020-05-29 10:28:34	<input type="button" value="remove"/>
2	SL91778C_v5_0.bin	148004	2020-10-14 16:17:48	<input type="button" value="remove"/>

Figure 25: Web Manager - Controller - SLC - HTTP(s) Firmware Upload

- In the file selection dialogue select the local firmware file and click the button **Ok**.
- Click on the button Start to begin the upload process to the G6 device.
 - After successfully uploading the file it appears in the section **available SLC firmware files on device**.

Note:

This list contains all available firmware files stored in the controller specific directory of the G6 device's memory. To remove this file click on the respective button **remove**.

Using the Web Manager:

- To update the controller's firmware open the screen **SmartOffice** and change to the tab **Device Configuration**.

Device.smartoffice.device_config (11 of 64 entries)

#	Parameter	Value
	device name	SLC_1
	location	
	latitude	
	longitude	
	altitude	
	placement	UNSET
	product type	SMARTLIGHT_CONTROLLER
	device id	00:60:A7:09:B6:E1
1	network address	
	additional parameter	
	network failure action	KEEP_CURRENT
	identify	identify
	restart	restart
	calibrate	calibrate
	pair	pair
	unpair	unpair
	update firmware	update firmware

add table entry unique value for device_name +

refresh apply to running configuration

Figure 26: Web Manager - SmartOffice - Device Configuration - Update Firmware

- In the section **Device.smartoffice.device_config** scroll down to the respective controller.
- In the field **update firmware** enter the name of the firmware file you want to load into the controller and click on the button **update firmware**.

Note:

If the input field is left blank the latest firmware file is selected by default.

8 Configuring MQTT

The MICROSENS Smart Lighting Controller acts as MQTT client for sending and receiving MQTT messages from and to an MQTT broker in the network, regarding the controller's values. This is important if you want to use the Smart Lighting Controller in automation projects with interaction between field devices.

8.1 Prerequisites

The controller always works with IPv6 Link Local Addresses. Therefore, the MQTT broker has to be enabled working with IPv6 addresses. However, he can easily translate between IPv4 and IPv6 because of the architecture of MQTT.

The MQTT protocol enables a very large range of different devices acting as broker, publisher and subscriber on the OSI transport layer. The device communicates only via TCP port 1883 or – if adjusted – over Websockets on Port 9001 for external communications.

8.2 Using Smart Config Tool for MQTT Configuration

Note:

Use the MICROSENS Smart Config Tool for MQTT configuration of the Smart Lighting Controller. The application is available for download via the MICROSENS web site (www.microsens.com). Therefore, navigate to the controller's product page, scroll down to the secure download area and login with your credentials. If you are not registered yet, click on "Not registered?" to apply for login data.

To configure the MQTT settings as follows:

1. Start the Smart Config Tool.

Note:

This is a portable Microsoft® Windows® application that works without installation. For general information about using the Smart Config Tool please refer to the application's help function via the button **instructions** on the upper right hand pane.

Note:

The Smart Config Tool version V0.5.0 or newer is required to manage a Smart Lighting Controller.

2. Hit the button **Scan** on the upper left hand pane.

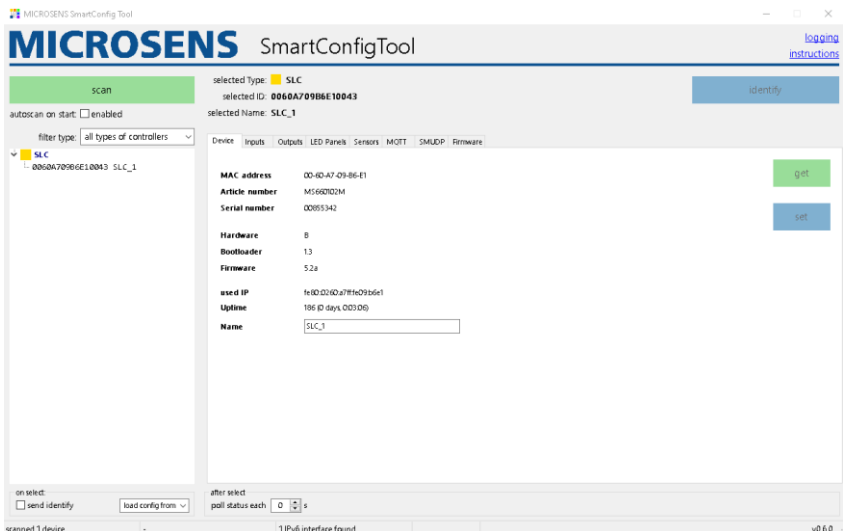


Figure 27: Smart Config Tool - Start Page - Scan Result

A tree view list of all identified devices appears after the scan process is finished.

- In the tree view select the device you want to configure and its configuration is shown automatically. If the parameter should be updated, click on **get** for updating the values.

Note:

As the configuration of the device took place previously via the Web Manager GUI it is not necessary to change parameters like device name or port names here. Should this be necessary anyway, bear in mind to double-check those settings with the Smart Director settings (e.g. adapt scripts etc.).

Note:

Select the option **load config from selected device** from the drop-down list on the bottom left hand pane to show all the device's parameters immediately after selecting the device in the tree view.

- Click on the button **identify** to cause the selected device's port LEDs to blink, making sure this is the device you want to configure within the following steps.
- For configuring MQTT change to the tab **MQTT**.

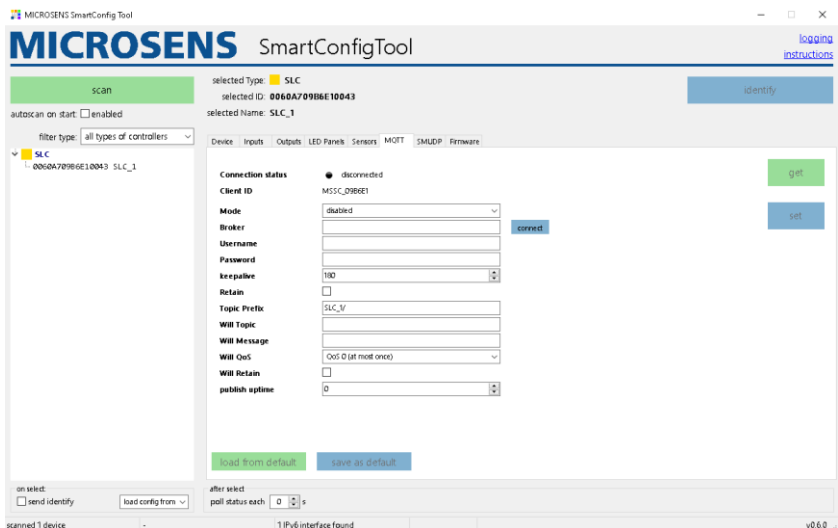


Figure 28: Smart Config Tool - MQTT Parameters

The parameters have the following meaning:

- **Connection Status:** Shows the connection status to the MQTT broker (read only).
 - Disconnected: No active connection to an MQTT broker in the network.
 - Accepted: The Smart Lighting Controller is connected to an MQTT broker.
 - Timeout: The connection to the MQTT broker is closed due to a timeout.
 - refused protocol: The MQTT broker refused the connection due to an invalid or unknown MQTT protocol version.
 - refused ID: The MQTT broker refused the connection due to an invalid client ID.
 - refused server: The MQTT service is unavailable.
 - refused authentication: The MQTT broker refused the connection due to invalid client credentials.
 - refused authorisation: The client does not have the appropriate access rights.
 - unknown: The connection closed due to unknown reasons.
 - connecting: The Smart Lighting Controller is connecting to the MQTT broker.
 - paused: The connection is paused.

- **Client ID:** The client ID that is built from a part of the MAC-Address which is shown on the tab **Device** (read only).
- **Mode:** Determines the MQTT mode (read/write).
 - Disabled: MQTT disabled.
 - QoS 0 (at most once):
 - no guarantee for message delivery
 - no acknowledgement of receiving the message by MQTT broker
 - no storing or re-transmitting the message by MQTT publisher
 - Packet ID automatically set to "0"
 - QoS 1 (at least once):
 - guarantee for delivering the message successfully at least one time to the broker
 - storing and re-transmitting the message unless acknowledgement by the broker
 - acknowledgement contains the unique packet ID only, so the publisher can assign message and acknowledgement
 - QoS 2 (exactly once):
 - guarantee for delivering every message exactly one time to the broker
 - publisher and broker using a four-part handshake for sending and acknowledgement
 - acknowledgement messages between publisher and broker contain the packet ID only to assign message and acknowledgements
- **Broker:** Sets the IPv6 address of the MQTT broker (read/write).
- **Username:** Username for MQTT broker access (read/write).
- **Password:** Password for MQTT broker access (write).
 - As soon as valid parameters for broker IPv6 address, credentials and MQTT mode are set and the broker is reachable, the MQTT broker connection status changes to "accepted".
- **Keepalive:** Sets the interval in seconds within which the controller sends a message to its MQTT broker (read/write) to announce itself as present. This prevents from being disconnected by the broker.
- **Retain:** This flag determines whether the broker will save this message as the last valid sample for this specific topic. In case a new MQTT client subscribes for this topic the broker transmits this message to the subscriber.
- **Topic Prefix:** The MQTT topics will always start with this string as identifier (read/write).
- **Will Topic:** This "last will topic" is sent to the MQTT broker on every first connection or on a parameter change. The broker forwards it to subscribers in case the controller (as publisher) loses the connection to the broker indicating the connection failure (read/write).
- **Will Message:** Sets the message for the last will topic in case of loss of connection (read/write).
- **Will QoS:** Sets the MQTT mode for the last will topic (read/write).
 - Settings correspond to the MQTT mode settings above. It is recommended to use a higher QoS level for last will topics.
- **Will Retain:** If set the broker saves the last will message to inform new subscribers about the controller has lost its connection previously (read/write).
- **Publish uptime:** Sets the interval in seconds within which the controller sends its uptime to the broker using the topic "<topic prefix>/uptime" (read/write).
 - Setting this parameter to "0" disables this function.

8.3 Using MQTT Topics with MICROSENS Switches

A topic can be understood as the category of a message. Topics are structured hierarchically (with a forward slash as delimiter between levels), comparable to a file system structure (e.g. "Building/Floor1/Room1/CeilingLight").

Topics are defined by the user, where a user friendly self-descriptive naming convention mirrors the Smart Building infrastructure.

Topic names are case sensitive (".../CeilingLight" differs from ".../ceilinglight") and must contain at least one character.

Note:

It is possible to use every UTF-8 character (besides "\$" since this character is used by the broker for internal statistics).

The use of the following wildcards is possible:

- **+**: This character replaces a single level in a topic.
Example: "Building/Floor1/+/Temperature"
This topic addresses the "Temperature" related messages for all rooms on "Floor1".
- **#**: This character replaces multiple levels in a topic.
Example: "Building/Floor1/#"
This topic addresses all occurring messages on "Floor1".

Note:

The use of wildcards is allowed when using microScript to register topics.

It is not allowed using the MQTT mapping table and matching multiple topics to only one component is not appropriate (e.g. matching a sensor to a topic containing multiple rooms).

For setting up topics or IDs more easily it is possible to use specific variables. The following variables with their respective value are available:

- **{SMO}**: fixed text "SmartOffice"
- **{MFG}**: fixed manufacturer's name (i.e. "MICROSENS")
- **{MAC}**: MAC address of the device
(Device.factory.device_mac, e.g. "00:60:A7:09:37:4E")
- **{IP4}**: IPv4 address of this device
(Device.ip.v4_status.dynamic_device_ip, e.g. "10.100.89.187")
- **{IP6}**: IPv6 address of this device
(if enabled, Device.ip.v6_status.ip, e.g. "fe80::260:a7ff:fe09:374e/64")
- **{DMN}**: Domain name of the Smart Office network
(Device.smartoffice.director_config.domain_name, e.g. "domain1")
- **{ART}**: article number of this device
(Device.factory.article_number, e.g. "MS652119PM")
- **{SER}**: serial number of this device
(Device.factory.serial_number, e.g. "00345860")
- **{LOC}**: SNMP SysLocation
(Management.snmp.device_info.sys_location, e.g. "Office")
- **{NAM}**: SNMP SysName
(Management.snmp.device_info.sys_name, e.g. "MICROSENS G6 Micro Switch")

The variables can be combined e.g. in topics like "{SMO}/{MFG}_{MAC}/".

Note:

These variables are limited to the use with MICROSENS G6 switches (e.g., for microScripts). They cannot be used i.e. with MQTT topics of a Smart Lighting Controller.

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Document ID: QSG-EN-20013