

## **Quick Start Guide**

### Commissioning the Smart Lighting Controller (SLC)

MICROSENS GmbH & Co. KG  
Kueferstr. 16  
59067 Hamm/Germany  
Tel. +49 2381 9452-0  
FAX +49 2381 9452-100  
E-Mail [info@microsens.de](mailto:info@microsens.de)  
Web [www.microsens.de](http://www.microsens.de)

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## 1. 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),
- setting up access via Network Management Platform (NMP) and Smart Building Manager (SBM).

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



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!

## 2. Interfaces and Operating Elements

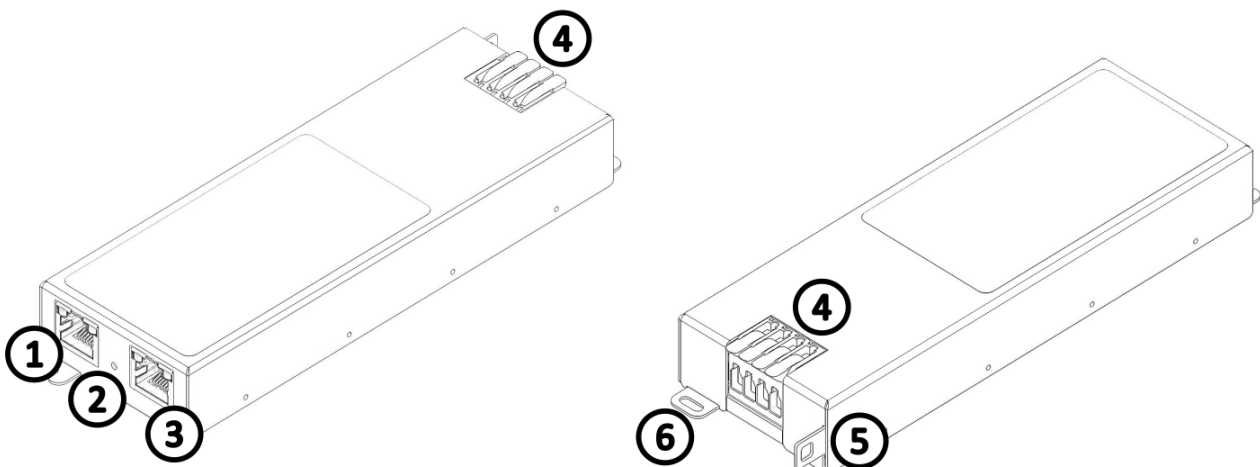


Figure 1. Interfaces - SLCv3

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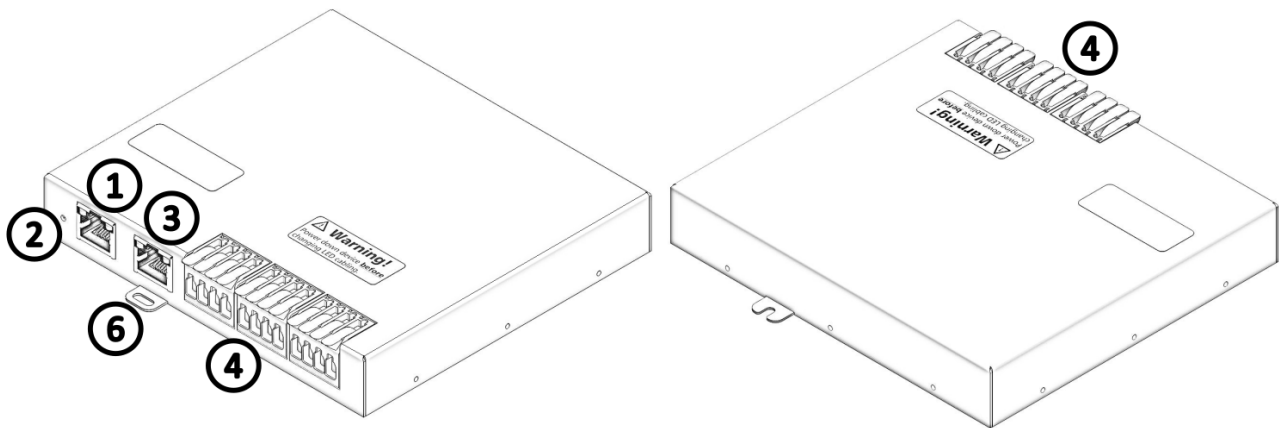


Figure 2. Interfaces - SLCv4

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

## 3. Mechanical Handling

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

- A clamp for top hat rail mounting
- and mounting tabs for direct attachment to wall, ceiling or any other backing equipment (2 or 4 per Device).

### 3.1. Mounting Tabs

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

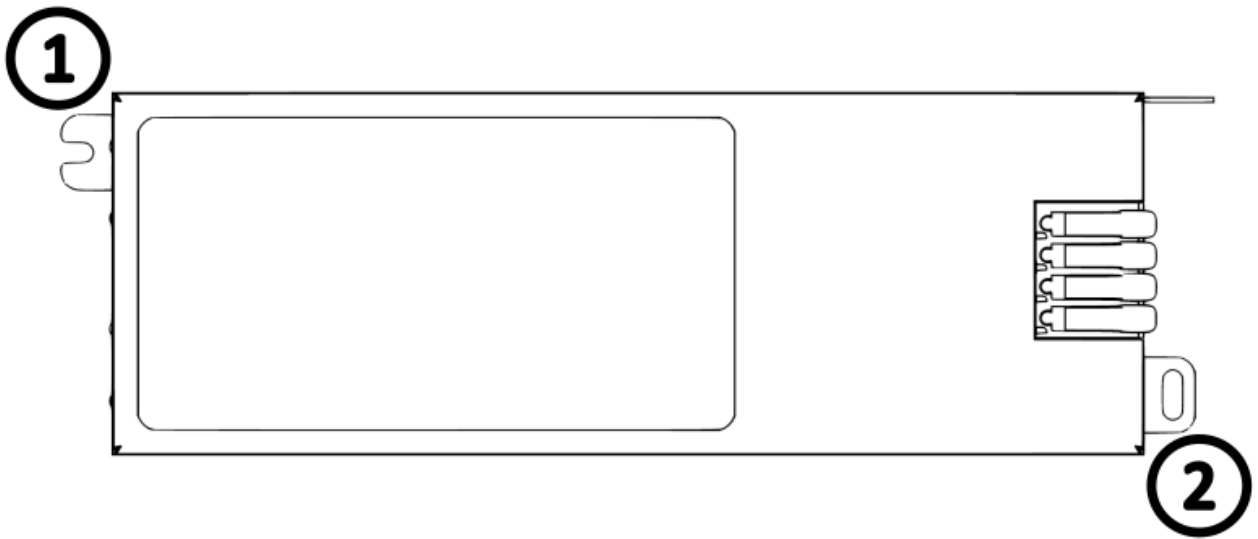


Figure 3. Mounting tabs - SLCv3

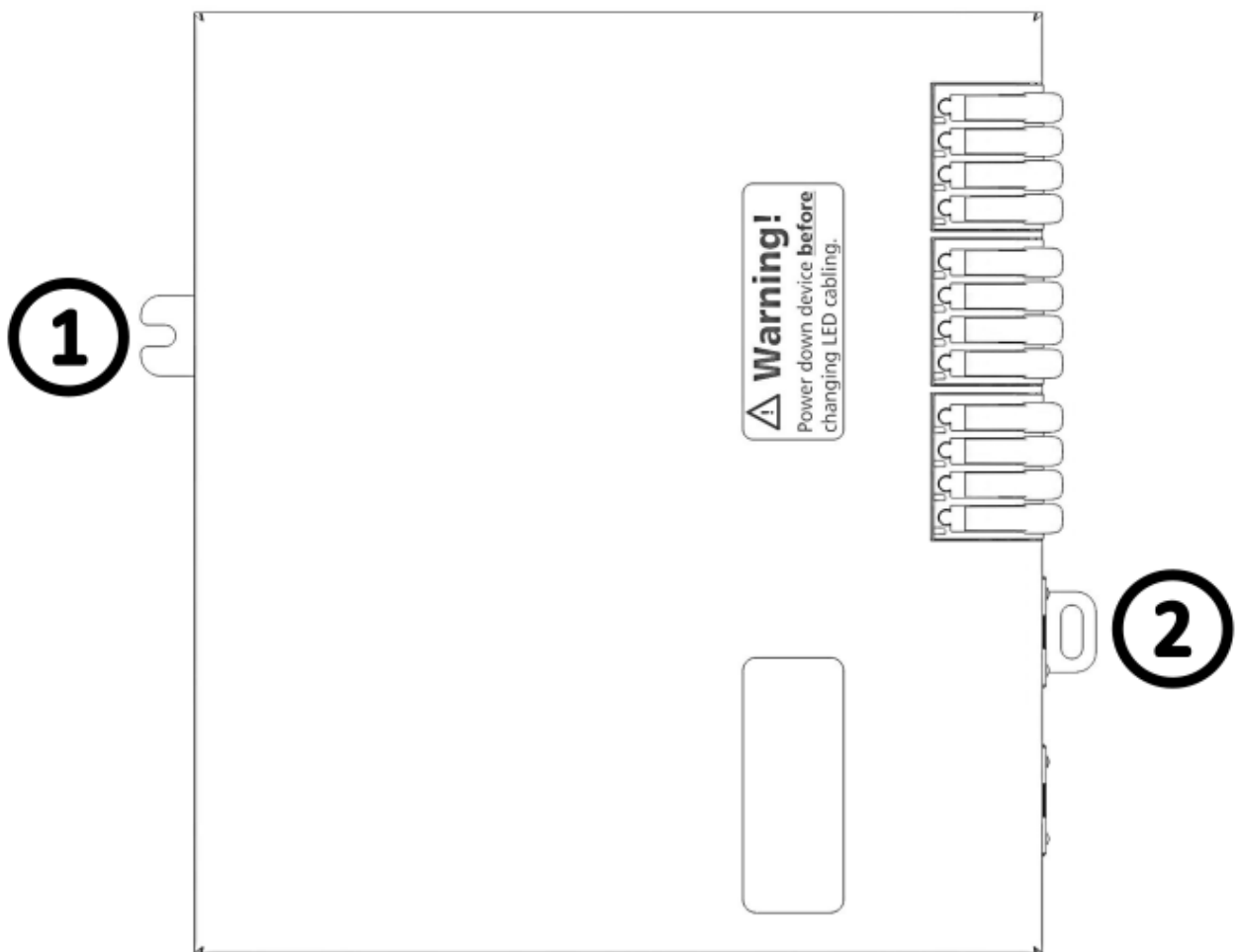


Figure 4. Mounting tabs - SLCv4



Make sure to secure the attachment adequately when using less mounting tabs! It is not recommended to use less than two mounting tabs on different

| sites.

### 3.2. Top Hat Rail Mounting and Demounting

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



If the clamp is not already assembled and attached to the housing upon shipment, please assemble and attach it to the housing. Be sure the clamp's release lever (Fig. 3, ③) is pointing to the side with the Ethernet port (Fig. 1, ③).

#### 3.2.1. Mounting on Top Hat Rail

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

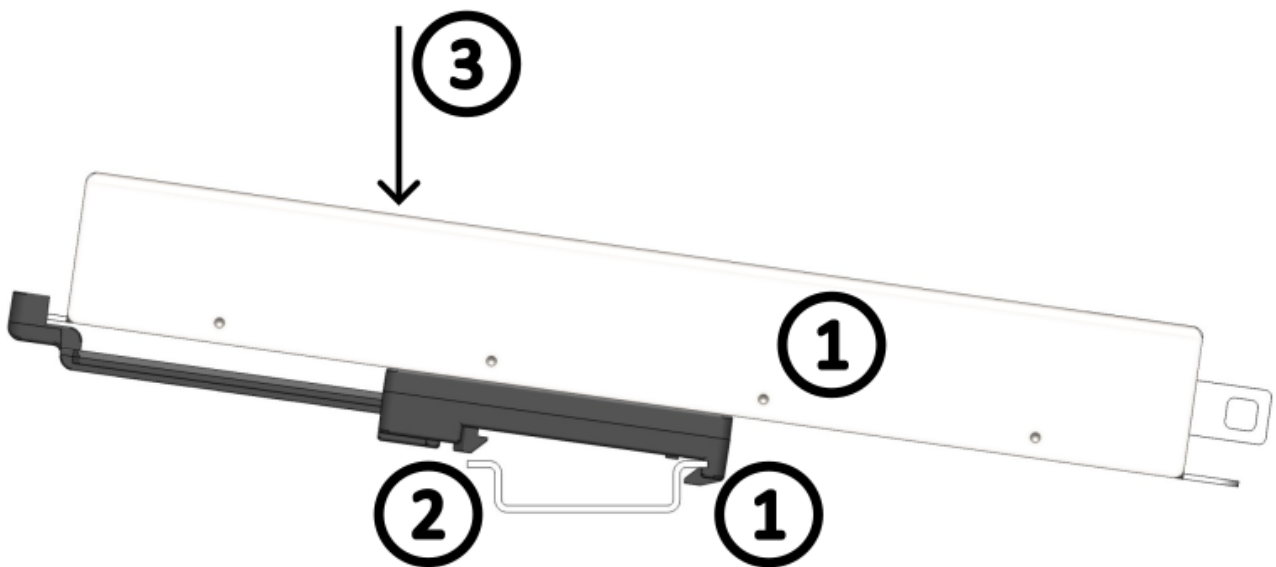


Figure 5. Top hat rail mounting - SLCv3

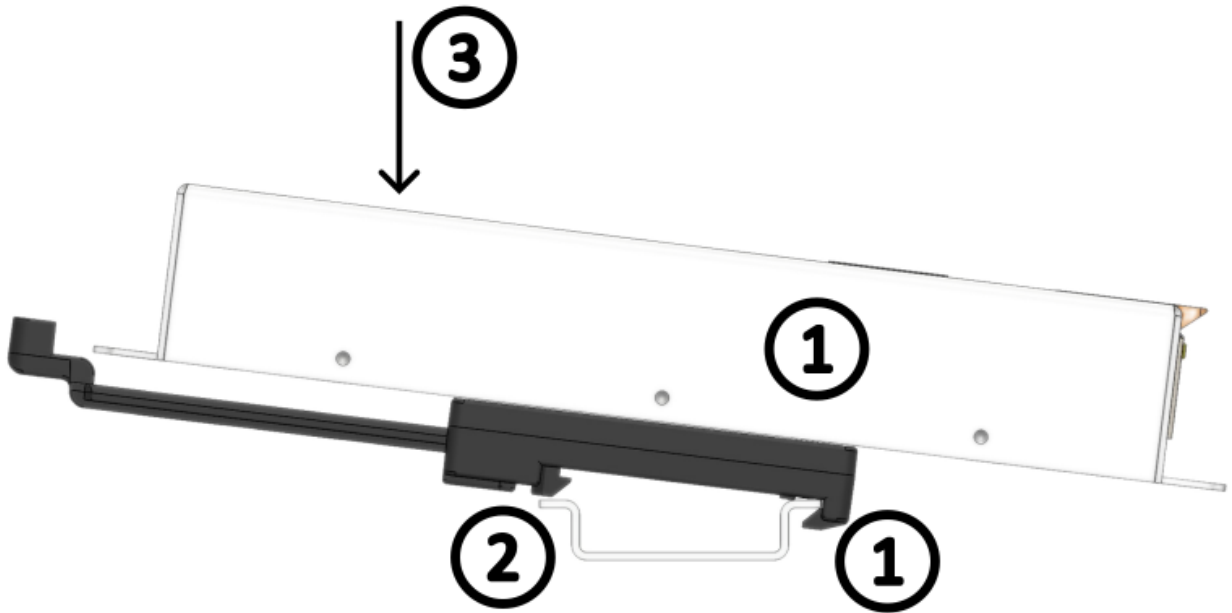


Figure 6. Top hat rail mounting - SLCv4

**3.2.2. Demounting from Top Hat Rail**

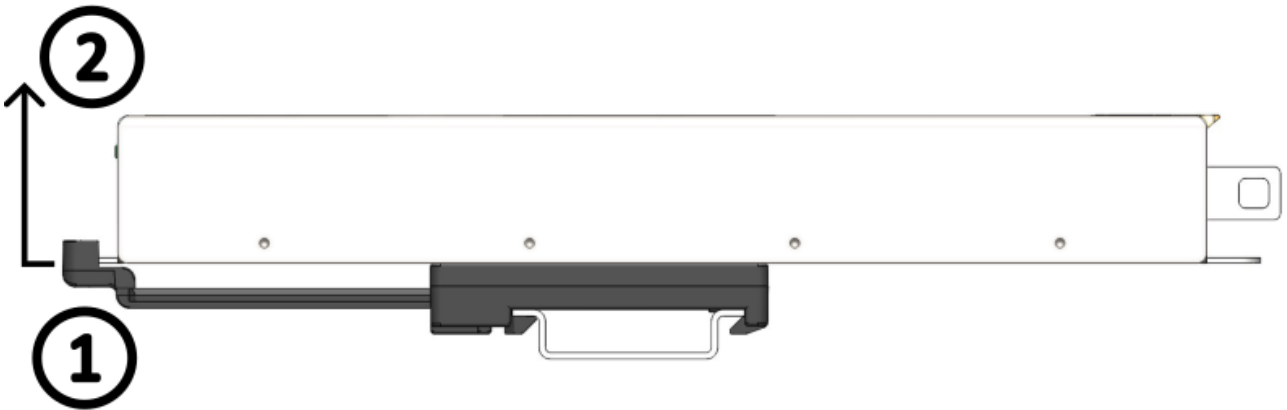


Figure 7. Top hat rail demounting - SLCv3

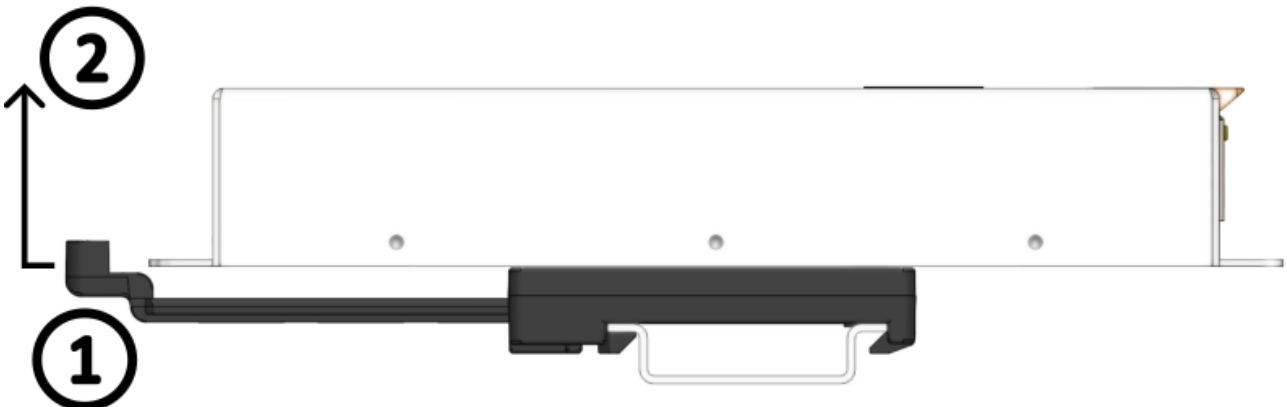


Figure 8. Top hat rail demounting - SLCv4

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

## 4. Connecting the LED Light



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!

- Connect the LED light cable to the push-in clamp (Fig. 1, ④).
- Make sure the connected LED light meets the requirements of the interface described in the Datasheet of the Smart Lighting Controller.

## 5. Connecting the Smart Sensor



Make sure to use the Smart Sensor which matches the respective SLC. A wrong combination of Smart Sensor and SLC may damage the Smart Sensor permanently! Please contact MICROSENS Support if it is not clear which Smart Sensor to use.



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 (Fig. 1, 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.



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

## 6. Connecting the Power Supply

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



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



The Smart Lighting Controller powers a connected LED light via the PoE power supply. Make sure that the powering PoE device is able to deliver a power of at least 30 W and the connected Ethernet cable matches the described parameter in the Datasheet of the Smart Lighting Controller.

### 6.1. 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** in 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 (Fig. 1, ⑤ or ⑥) to the building's ground potential and thus avoid "floating ground" problems. Besides safety issues, a floating ground of the network can cause problems if only one component is accidentally or purposefully is grounded (Fig. 5).

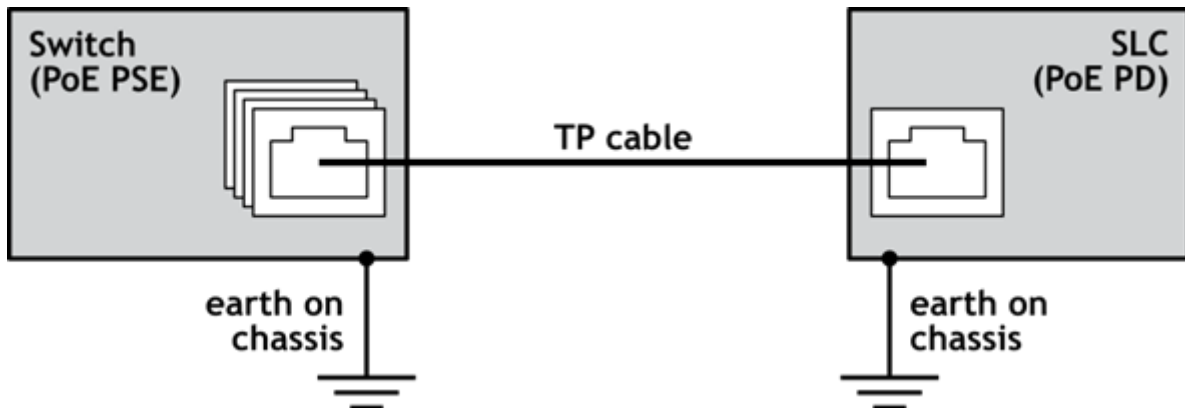


Figure 9. PoE supply with grounding

## 7. Reset the Smart Lighting Controller

The Smart Lighting Controller is equipped with a reset button (Fig. 1, 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.

## 8. Operating the Smart Lighting Controller with MICROSENS Switches



The usage of the MICROSENS Smart Lighting Controllers is only possible with MICROSENS switches containing Firmware 10.7.7b and newer. IPv6, LLDP and PoE have 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. Further it is possible to configure the Smart Lighting Controller over the Smart Config Tool. Both methods have the ability to overwrite the previous configuration set by the other method.



The usage of IPv6 link local addresses makes it 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.

8.1. 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. The Parameters are immediately sent to the Smart Device. If not, restart the SmartOffice by disabling and then enabling it again.

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



It is always possible to change the controller's settings through the templates. The adjustments will be sent either immediately or with the next restart of SmartOffice.

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** option under **Device**, then select the **SLC** tab. \* In the **Device.controller.smartlight\_config** section, type in a unique name for the Smart Lighting Controller (e.g. "SLC\_1" as a unique name) in the text box corresponding to **add table entry** and click on **+**.

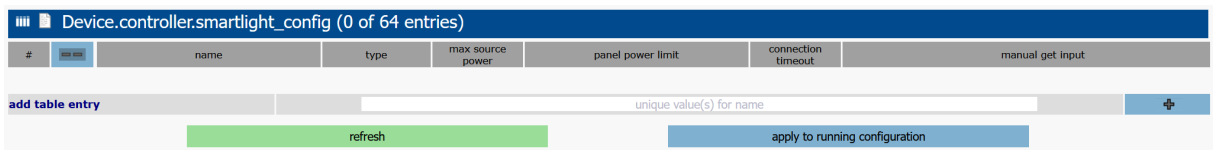


Figure 10. Web Manager - Controller - SLC - Enter New Entry

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

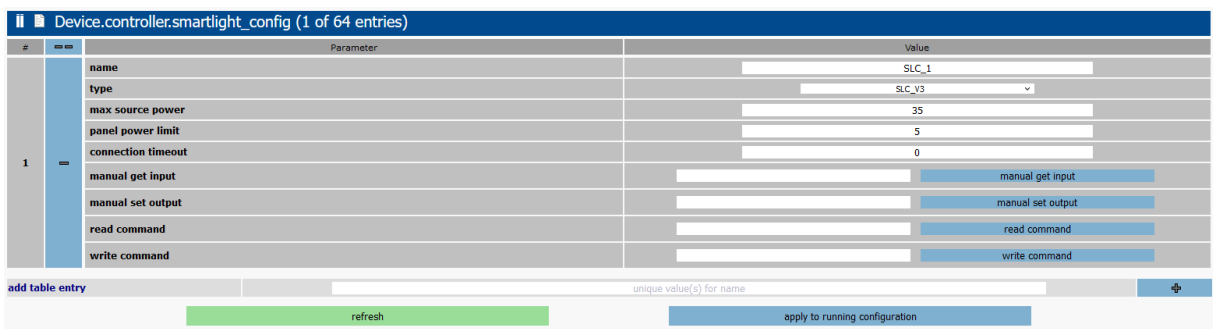


Figure 11. Web Manager - Controller - SLC - Default Values

- **Name:** The previously assigned device name.
- **Type:** Select the specific type depending on the device model.
- **Max Source Power:** The Power Potential of the Power Supply.
- **Max Panel Power:** The Power limit of the connected LED's. This value will be used for calibration.

### 8.2. 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.



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** option under **Device**, then select the **Basic Configuration** tab.

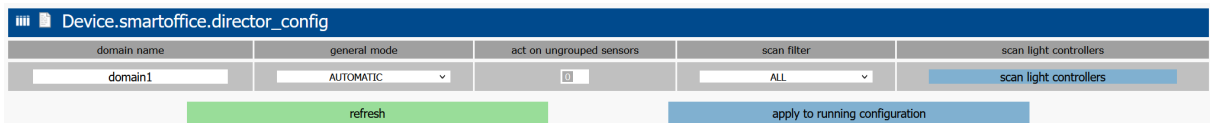


Figure 12. Web Manager - SmartOffice - Basic Configuration - Scan Controllers

- Click on **scan light controllers** under the **Device.smartoffice.director\_config** section to find unpaired devices in the local network.
  - The SmartDirector starts searching for connected Smart Controllers. As long as no controller is found the **scanned Light Controllers** section stays empty. If there are a lot of Smart Lighting Controllers in the network, it is recommended to divide the network into smaller parts for a better overview.

scanned Light Controllers (1 Entry, Filter = all)									
# 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 n.a.	fe80::260:a7ff:fe0c:55f9 static	547 0 days, 00:09:07 0	7 L 6.18	M5660103M 01125827 SLC_V3V4	0068A79C55F90043 0000000000000000 0068A7892F878044	unconfigured DirID not set	identify add	pair as SLC_1_1	

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

Figure 13. Web Manager - SmartOffice - Basic Configuration - Available Controllers

- After successfully scanning for available Smart Controllers the Web Manager lists all found 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 **identify** of a particular controller entry causes the LED lights of this controller to blink several times. This ensures the use of the correct controller for the following steps.
- Click on **add** to create the respective device entry.
  - This new device entry is named "scanned\_<Controller-ID>" and assigned to the prod-

uct type "SMARTLIGHT\_CONTROLLER".

- If it is not possible to divide the network into smaller parts, it is possible to type in the MAC Address of a Smart Lighting Controller directly into the entry corresponding to the Device ID row under the **Device.smartoffice.device\_config** section. This section is available in the **Device Configuration** tab.
- Select the **Device Configuration** tab and in the **Device.smartoffice.device\_config** section, scroll down to the previously created entry.

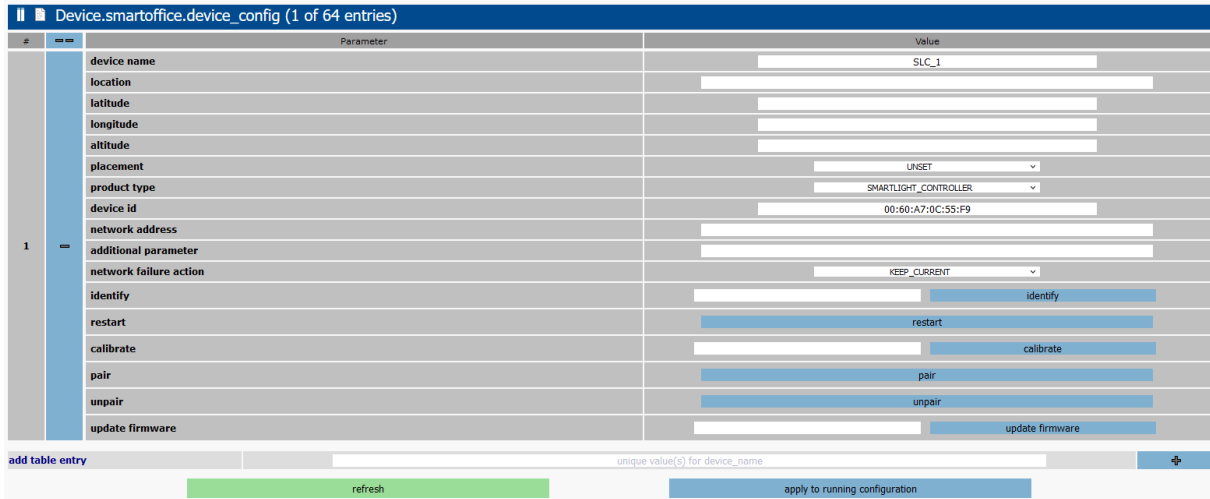


Figure 14. Web Manager - SmartOffice - Device Configuration - Added Device

- 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 **Basic Configuration** tab and in the **Device.smartoffice.director\_config** section, click on **scan light controllers**.
  - The SmartDirector starts searching for connected Smart Controllers again. As long as no controller is found, the **scanned Light Controllers** section stays empty.
  - After successfully scanning for available Smart Controllers the Web Manager lists all found controllers.

scanned Light Controllers (1 Entry, Filter = all)										
# Slt/Prt	IP address IP mode	Uptime (sec) Uptime (decoded) HW 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:febc:55f9 static	865 0 days, 00:14:25 0	7 L 6.18	M5660103M 01125827 SLC_1	0060A70C55F90043 0060A7092FB70044 0060A7092FB70044	unconfigured DirID match	identify add	pair as SLC_1		

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

Figure 15. Web Manager - SmartOffice - Basic Configuration - Available Controllers

- The **Pairing Actions** column has a drop-down which lists the previously added and modified device entries.
- Find the required device and click on **force pair as**. When the device is successfully paired the "Status" entry in the **configured local name Status** column changes from "DirID mismatch" to "DirID match".

- 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.
- If the Function of Preset of a MVP was previously executed, the Smart Devices corresponding to the Preset MVP is added to the drop down list.

### 8.3. Calibration of LED Panel

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



It is important to calibrate connected and paired LED panels 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)

#### 8.3.1. Calibration of a 1-Channel LED 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 **SmartOffice** option under **Device**, then select the **Device Status** tab.
- In the **Device.smartoffice.device\_information** section:

Device.smartoffice.device_information (1 entry)		
#	Parameter	Value
	name	SLC_1
	hardware id	0060a70c5f5f90043
	device type	ACTOR_SENSOR
	operational state	NORMAL
	actor attributes	LED_PANEL_RAMP_TIME
1	sensor attributes	POWER
	vendor name	MICROSENS
	article number	MS660103M
	serial number	01125827
	hardware revision	L
	software version	6.18
	additional info	fe80::260:a7ff:fe0c:55f9 (encoded)

Figure 16. 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.
- Make sure that **operational state** parameter has its value as "NORMAL".

- Remember the **name** of the respective device.
- Switch to the **Device Configuration** tab.

#	Parameter	Value
	device name	SLC_1
	location	
	latitude	
	longitude	
	altitude	
	placement	UNSET
	product type	SMARTLIGHT_CONTROLLER
	device id	00:60:A7:0C:55:F9
1	network address	
	additional parameter	
	network failure action	KEEP_CURRENT
	identify	identify
	restart	restart
	calibrate	calibrate
	pair	pair
	unpair	unpair
	update firmware	update firmware

Figure 17. Web Manager - SmartOffice – Device Configuration - Calibrate

- Look for the corresponding device in the **Device.smartoffice.device\_config** section and click on **calibrate**. This starts the calibration process:
  - 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.
- In the case of a Smart Lighting Controller with more than one Channel, by typing in a number (1, 2, ...) in the field next to the calibrate button, a specific channel can be chosen. Further it is possible to type in a list of comma separated values for choosing channels.
- The LED panel is ready for use after a successfully finished calibration without errors.
- This is applied to the running configuration immediately; clicking on **apply to running configuration** is not necessary for it to take effect.

### 8.3.2. Calibration of a 2-Channel LED Panel with Common Electrodes

**i** | This description can also be applied to a unit with multiple inputs.

2-channel LED panels need a Smart Lighting Controller Channel 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 channel and provided with a cable bridge between both channels' power output ports (see Fig. 14).

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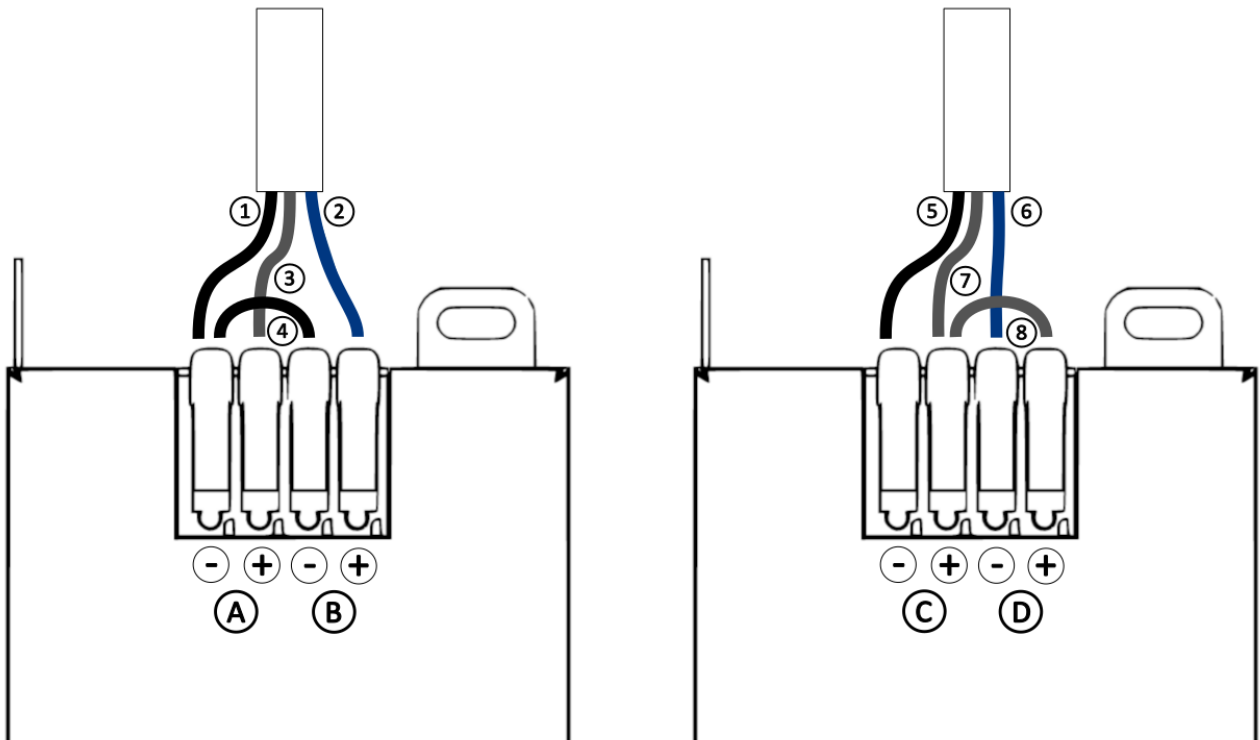


Figure 18. 2-Channel LED Panels with Common Electrodes - SLCv3

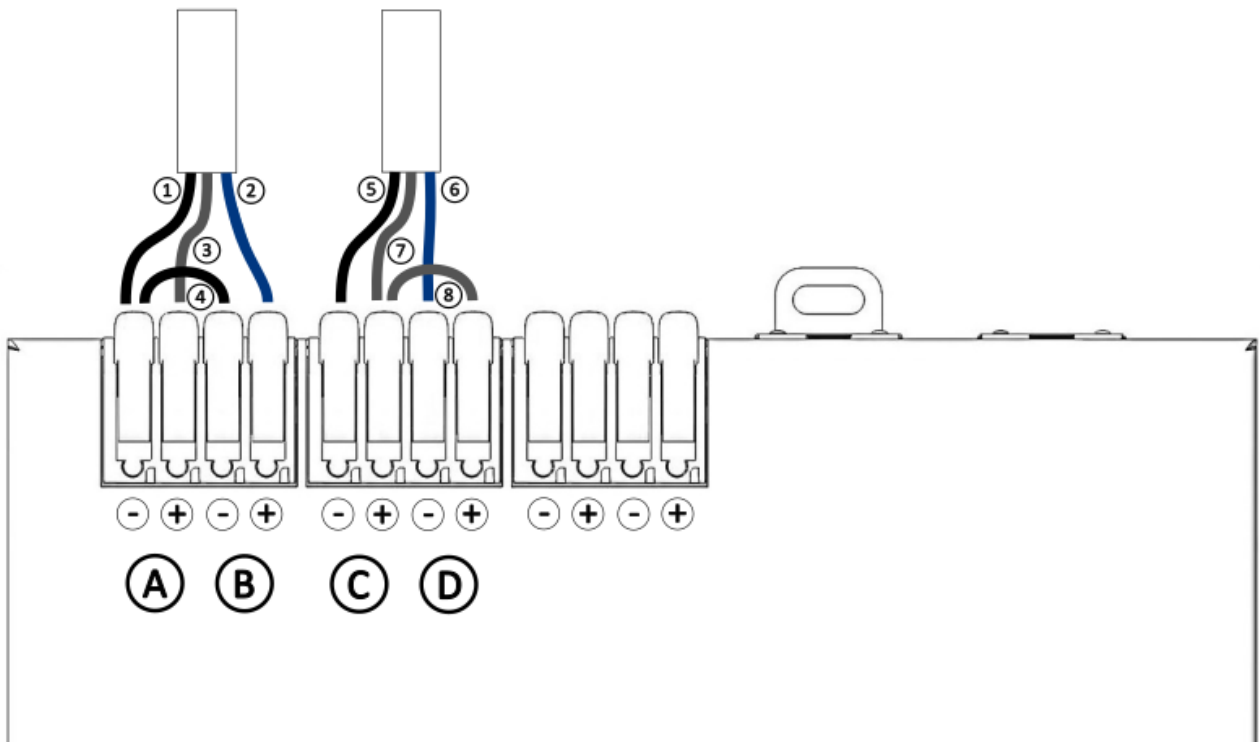


Figure 19. 2-Channel LED Panels with Common Electrodes - SLCv4

- |  |  |
|--|--|
| <p><b>1</b> Common Cathode</p> <p><b>2</b> Anode 1</p> <p><b>3</b> Anode 2</p> <p><b>4</b> Cable bridge between SLC A/B (cathodes)</p> | <p><b>5</b> Cathode 1</p> <p><b>6</b> Cathode 2</p> <p><b>7</b> Common Anode</p> <p><b>8</b> Cable bridge between SLC C/D (cathodes)</p> |
|--|--|



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 Controller Channels during the calibration process by using the cable bridge only after the particular calibration process is successfully finished.



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 Controller Channels independently as described above.

To calibrate a 2-channel LED panel connected to the 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 **SmartOffice** option under **Device**, then select the **Device Status** tab.
- In the **Device.smartoffice.device\_information** section:

#	Parameter	Value
	name	SLC_1
	hardware id	0060a70c35f90043
	device type	ACTOR_SENSOR
	operational state	NORMAL
	actor attributes	LED_PANEL_RAMP_TIME
	sensor attributes	POWER
1	vendor name	MICROSENS
	article number	MS660103M
	serial number	01129827
	hardware revision	L
	software version	6.18
	additional info	fe80::260:a7ff:fa0c:35f9 (encoded)

Figure 20. 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.
- Make sure that **operational state** parameter has its value as "NORMAL".
- Remember the **name** of the respective device.



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- Connect the LED panel's cathode (1 or 6) to the Smart Lighting Controller's negative port (B-, D-).
- Connect the LED panel's anode (2 or 7) to the Smart Lighting Controller's positive port (B+, D+).
- Switch to the **Device Configuration** tab.

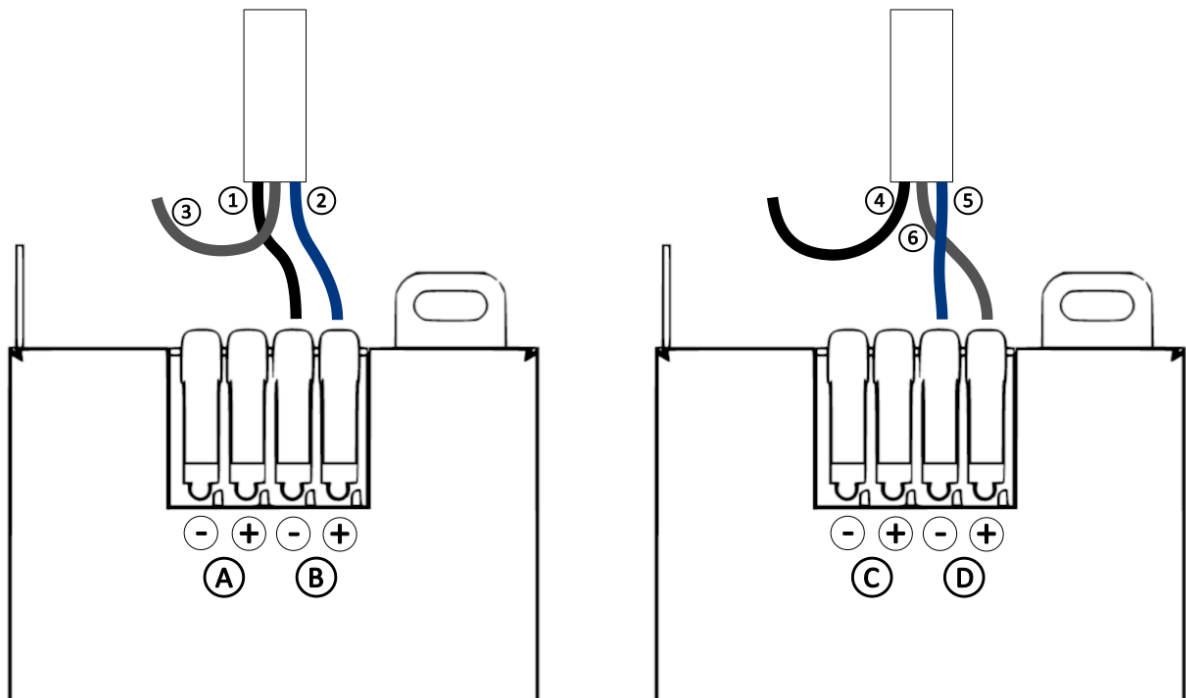


Figure 21. Calibration of a 2-Channel LED Panel - SLCv3 - Step 1

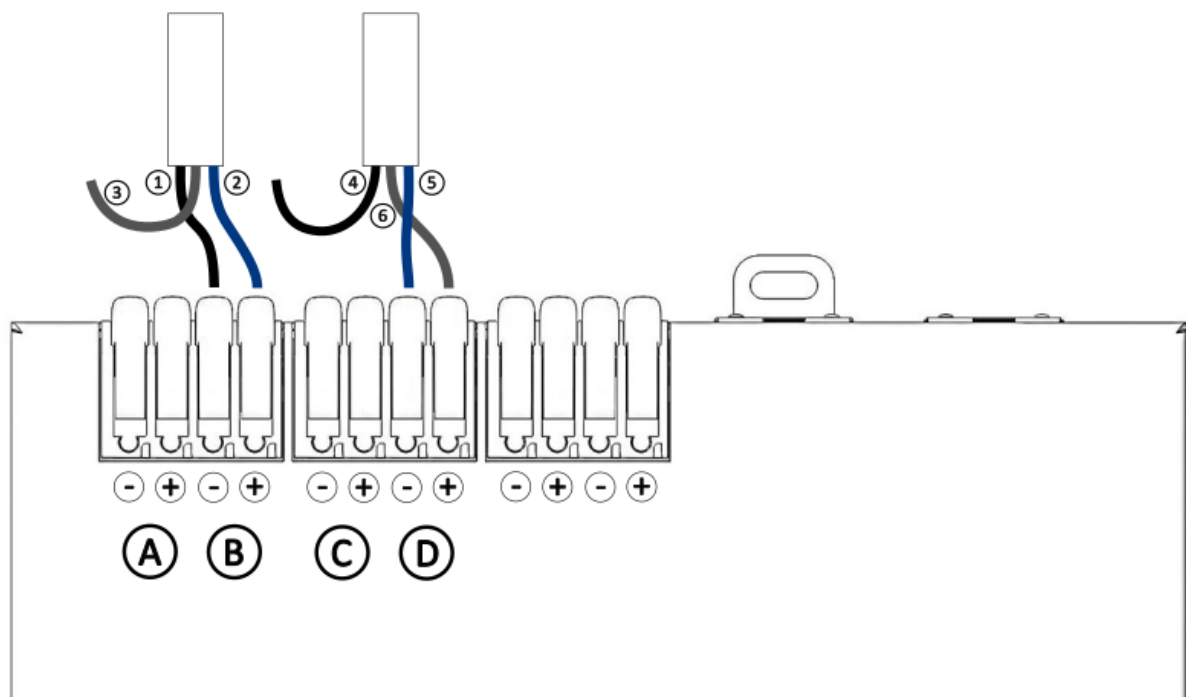


Figure 22. Calibration of a 2-Channel LED Panel - SLCv4 - Step 1

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

Device.smartoffice.device_config (1 of 64 entries)		
#	Parameter	Value
	device name	SLC_1
	location	
	latitude	
	longitude	
	altitude	
	placement	UNSET
	product type	SMARTLIGHT_CONTROLLER
	device id	00:60:A7:0C:55:F9
1	network address	
	additional parameter	
	network failure action	KEEP_CURRENT
	identify	identify
	restart	restart
	calibrate	calibrate
	pair	pair
	unpair	unpair
	update firmware	update firmware

Figure 23. Web Manager - SmartOffice – Device Configuration - Calibrate

- Look for the corresponding device in the **Device.smartoffice.device\_config** section and click on **calibrate**. This starts the calibration process:
  - 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.
- In the case of a Smart Lighting Controller with more than one Channel, by typing in a number (1, 2, ...) in the field next to the calibrate button, a specific channel can be chosen. Further it is possible to type in a list of comma separated values for choosing channels. Then click on **calibrate**.
- 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+).

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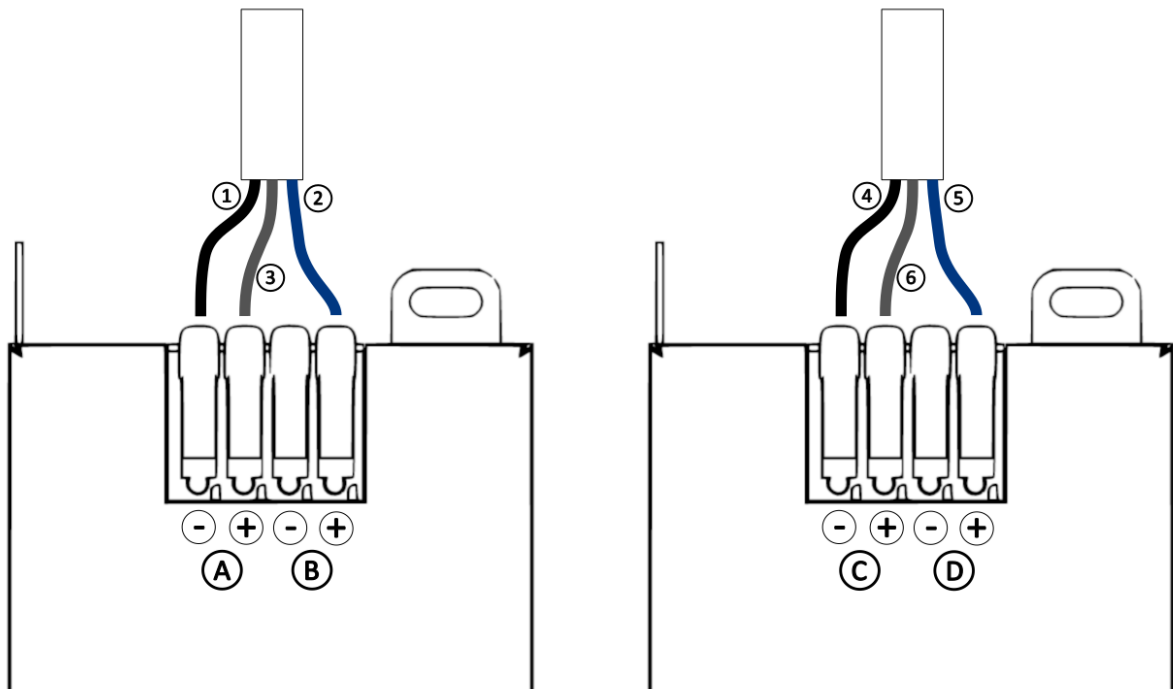


Figure 24. Calibration of a 2-Channel LED Panel - SLCv3 - Step 2

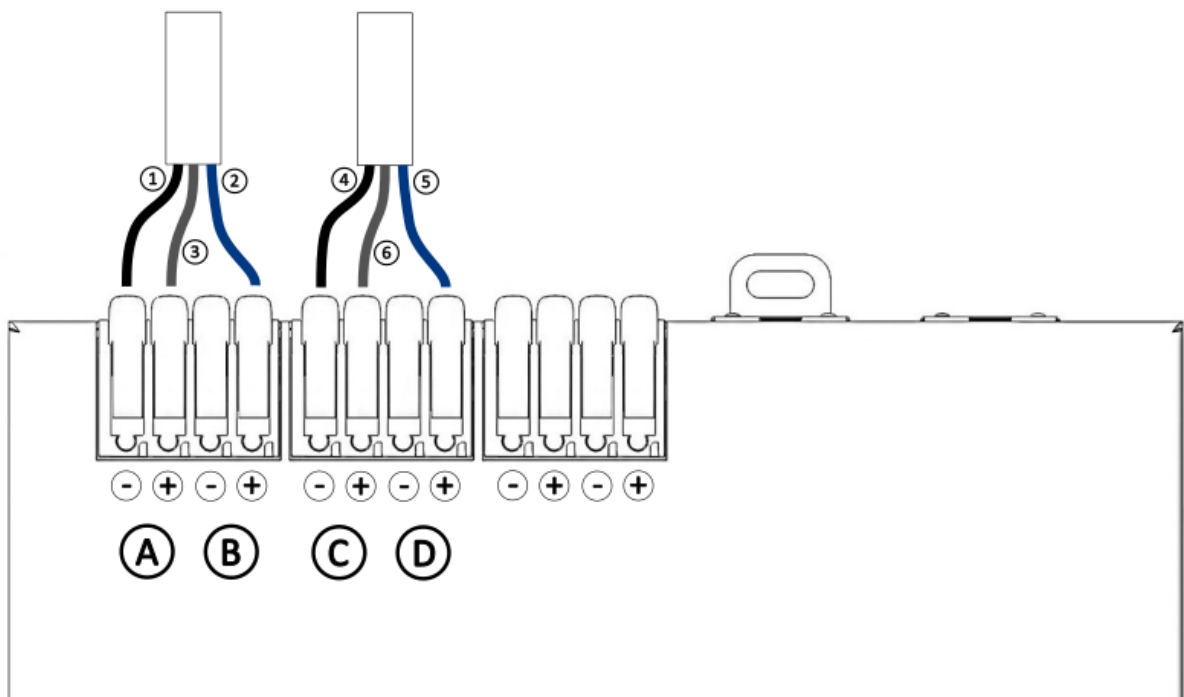


Figure 25. Calibration of a 2-Channel LED Panel - SLCv4 - Step 2

- Repeat the calibration process described above with the Smart Lighting Controller channels 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).

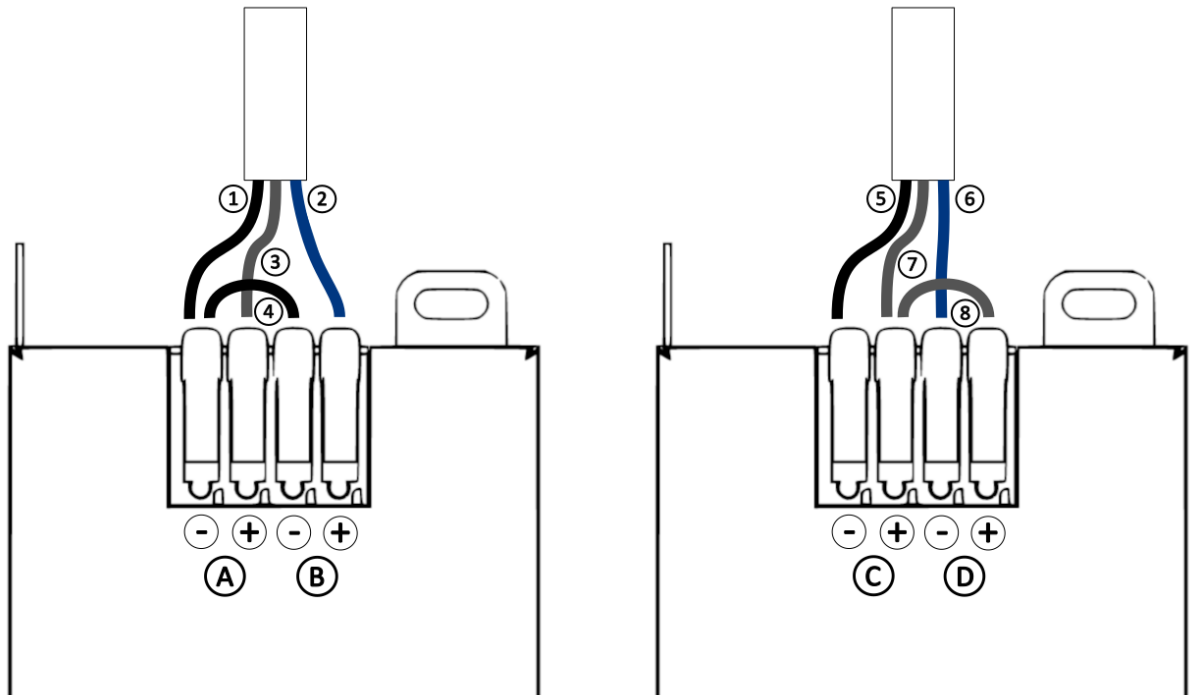


Figure 26. Calibration of a 2-Channel LED Panel - SLCv3 - Step 3

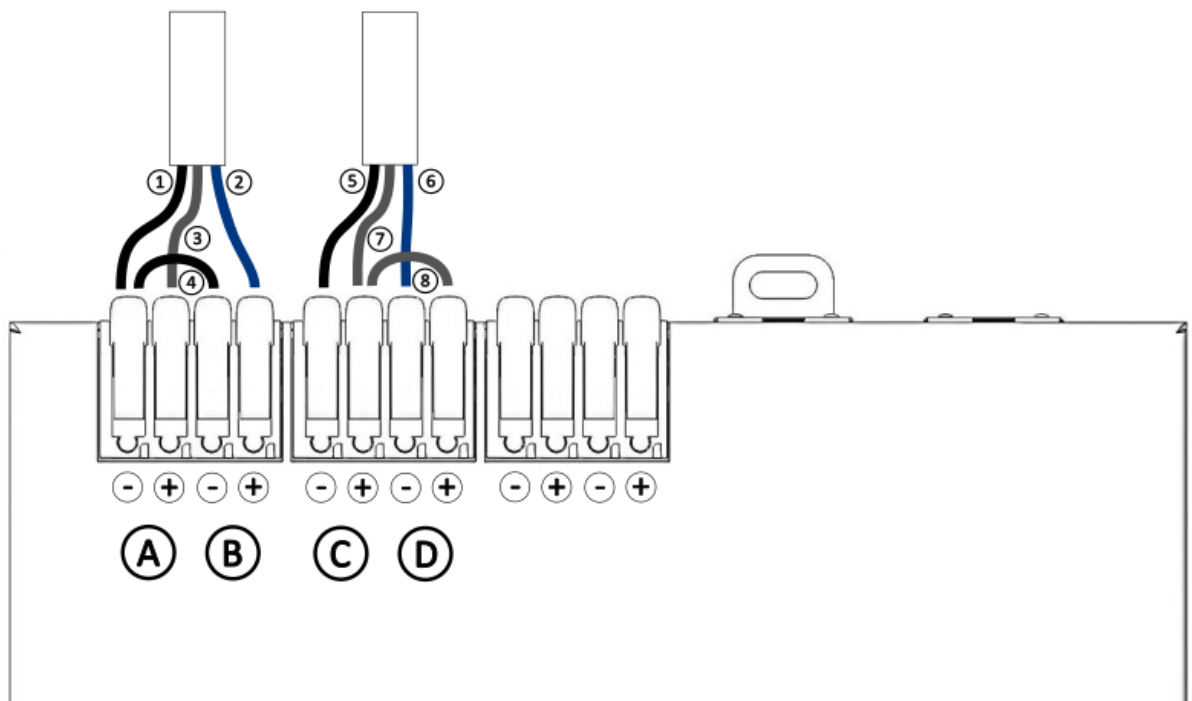


Figure 27. Calibration of a 2-Channel LED Panel - SLCv4 - Step 3

- The LED panel is ready for use.

### 8.4. 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. The following steps describe how to test whether the Smart Lighting Controller is correctly paired to a MICROSENS switch via the Web Manager of the MICROSENS switch.



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** option under **Device**, then select the **Device Status** tab.
  - There should be entry for the paired Smart Lighting Controller with the previously assigned device name listed in the **Device.smartoffice.device\_information** section.

#	Parameter	Value
	name	SLC_1
	hardware id	0060a70c55f90043
	device type	ACTOR_SENSOR
	operational state	NORMAL
	actor attributes	LED_PANEL_RAMP_TIME
1	sensor attributes	POWER
	vendor name	MICROSENS
	article number	MS660103M
	serial number	01125827
	hardware revision	L
	software version	6.18
	additional info	fe80::2601a7ff:fe0c:55f9 (encoded)

Figure 28. Web Manager - SmartOffice - Device Status - Smart Lighting Controller

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

#	device	instance	attribute	associated groups
1	Local_IO_Signal	1	INPUT	
2	Local_IO_Signal	2	INPUT	
3	SLC_1	1	POWER	
4	SLC_1	2	POWER	
5	BlindsActor_Zone_1_Id_1	1	DIRECTION	
6	BlindsActor_Zone_1_Id_1	1	POSITION	
7	BlindsActor_Zone_2_Id_1	1	DIRECTION	
8	BlindsActor_Zone_2_Id_1	1	POSITION	
9	SLC_1	1	BRIGHTNESS	
10	SLC_1	1	MOTION	
11	SLC_1	1	TEMPERATURE	
12	SLC_1	1	HUMIDITY	

refresh values every 3 seconds

refresh

Figure 29. Web Manager - SmartOffice - Sensor Status

- The Smart Lighting Controller with its assigned name should be listed in the **device** column under the the **Device.smartoffice.sensor\_list** section.
- There is a row entry, named according to its assigned attribute, for every digital input port of the controller in the **attribute** column. This corresponds to the attribute assignments "Din x attribute" defined in the controller's template configuration step (see above).

- The **instance** column 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, 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.
- Switch to the **Actor Status** tab.

#	device	instance	attribute	associated groups
1	Local_IO_Signal	1	DIGITAL_OUT	
2	Local_IO_Signal	2	DIGITAL_OUT	
3	SLC_1	1	LED_PANEL	
4	SLC_1	2	LED_PANEL	
5	SLC_1	1	RAMP_TIME	
6	SLC_1	2	RAMP_TIME	
7	SLC_1	1	RGB_LIGHT	

refresh values every 3 seconds

refresh

Figure 30. Web Manager - SmartOffice - Actor Status

- With actors or sensors already connected to the Smart Lighting Controller, it is possible to get or set values from specific ports. This can be accessed by selecting the **Controller** option under **Device** and then selecting the **SLC** tab.

#	Parameter	Value
1	name	SLC_1
	type	SLC_V3
	max source power	35
	panel power limit	5
	connection timeout	0
	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 31. Web Manager - Controller - SLC - Manually Get/Set Port Values

- In the **Device.controller.smartlight\_config** sections, 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 **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 1000" into the **write command** field and click on **write command**. After a short processing time the connected LED panel lights up and the Web Manager displays a confirmation message.

- If the entry mentioned involves a Smart Lighting Controller with more than one channel, the command "Dimlevel" without a specific channel number will execute the command to all of the channels. In the case only one channel needs to be controlled, type in "Dimlevelx 1000", where the "x" is the channel number.

### 8.5. 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** option under **Device**, then select the **SLC** tab and scroll down to the bottom of the page.
- Click on **Browse...** in the file column under the **HTTP(s) upload via Web Manager** section. This opens the browser’s file selection window.

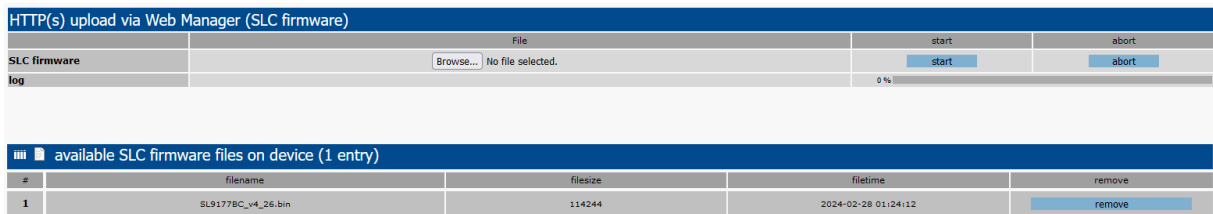


Figure 32. Web Manager - Controller - SLC - HTTP(s) Firmware Upload

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



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 **remove** corresponding to the firmware file to be removed.

- To update the controller’s firmware, select the **SmartOffice** option under **Device**, then select the **Device Configuration** tab.

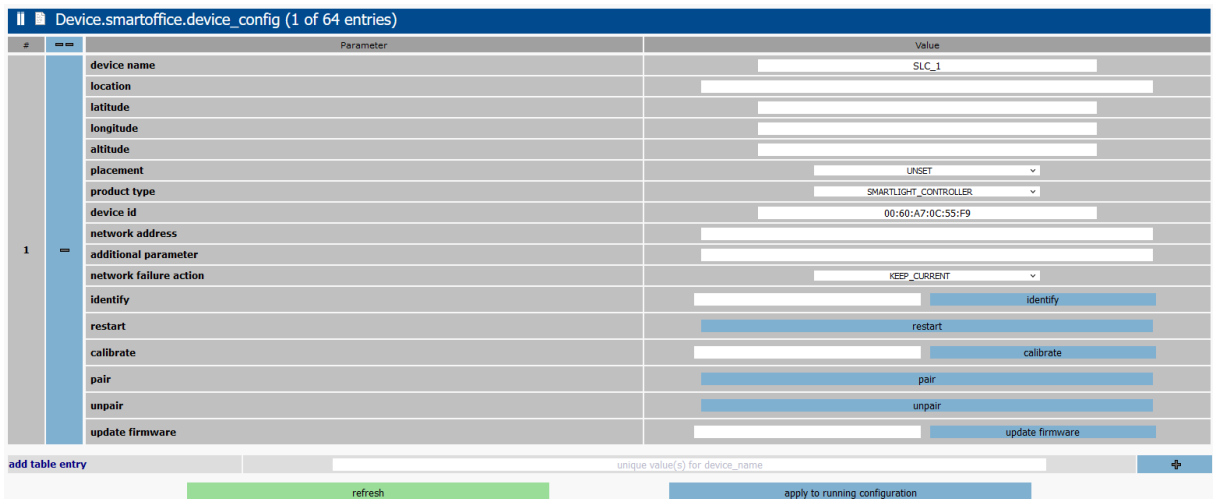


Figure 33. Web Manager - SmartOffice - Device Configuration - Update Firmware

- Scroll down to the respective controller, in the **Device.smartoffice.device\_config** section.
- Enter the name of the firmware file you want to load into the controller in the **update firmware** row and click on `update firmware`.



If the input field is left blank the latest firmware file stored on the G6 device is selected by default. This could be problematic, if a release candidate needs to be used. In this case, the name has to be typed in manually, as mentioned above.

## 9. Configuring MQTT

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

### 9.1. Prerequisites

The controller always works with IPv6 Link Local Addresses. Therefore, the MQTT broker has to be able to work with IPv6 addresses. However, the MQTT broker can easily translate between IPv4 and IPv6 addresses, which is possible due to 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.

### 9.2. Using Smart Config Tool for MQTT Configuration



Use the MICROSENS Smart Config Tool for MQTT configuration of the Smart Lighting Controller. The application is available for download in the MICROSENS web site ([www.microsens.com](http://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.



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 by clicking on `instructions` at the upper right hand corner.



The Smart Config Tool version V1.1.4a or newer is required to manage a Smart Lighting Controller.

2. Click on `scan all` at the left hand side below the MICROSENS logo.



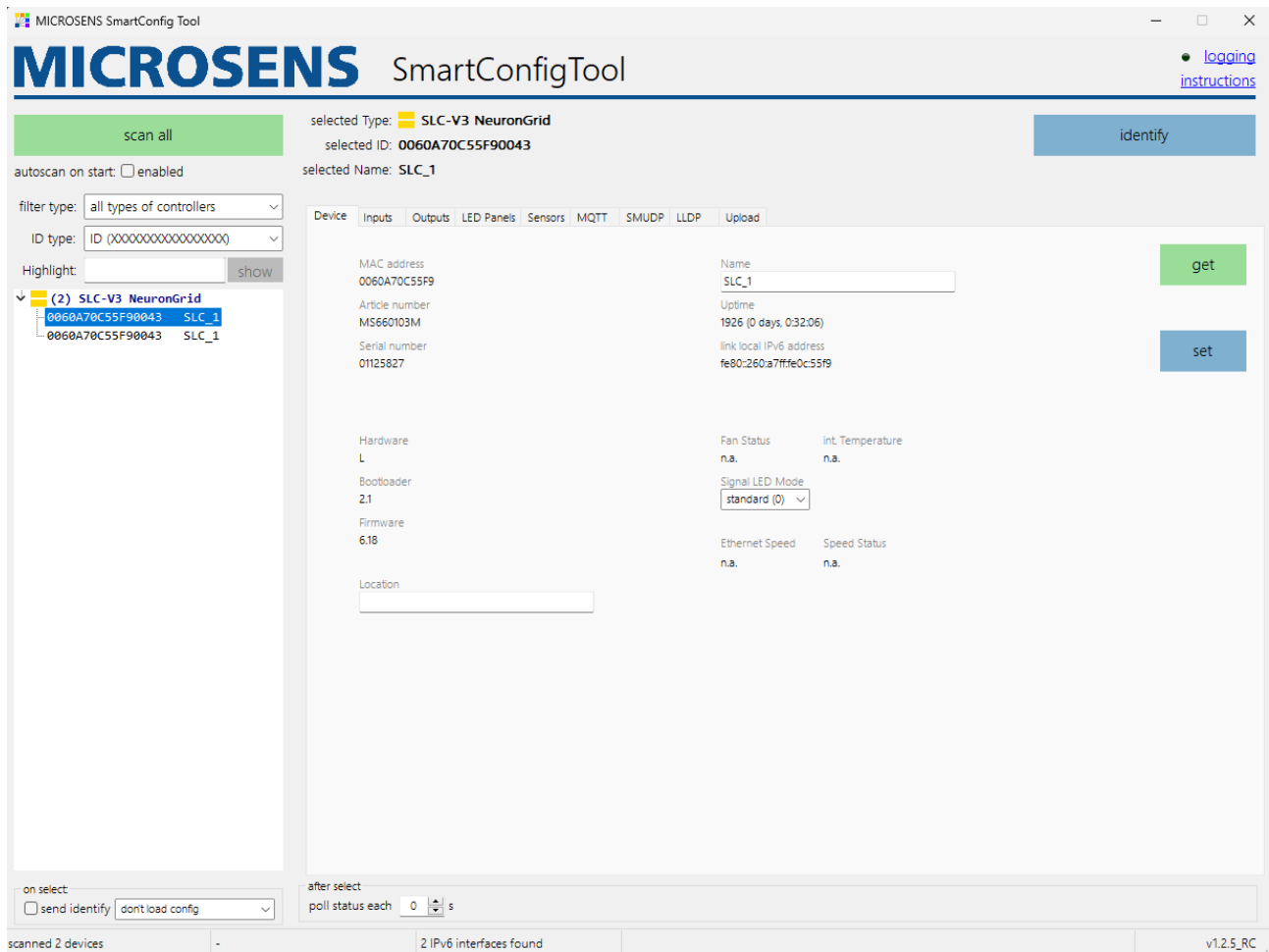


Figure 34. Smart Config Tool - Start Page - Scan Result

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

3. In the tree view select the device you want to configure and its configuration is shown automatically. Click on **get** to update the values.



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.). If you adjust the configuration it will overwrite the parameters in the Smart Office on the next restart.



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

4. Click on **identify** to make the LEDs on the selected device to blink. This ensures the use of the correct controller for the following steps.
5. For the MQTT configuration, switch to the **MQTT** tab

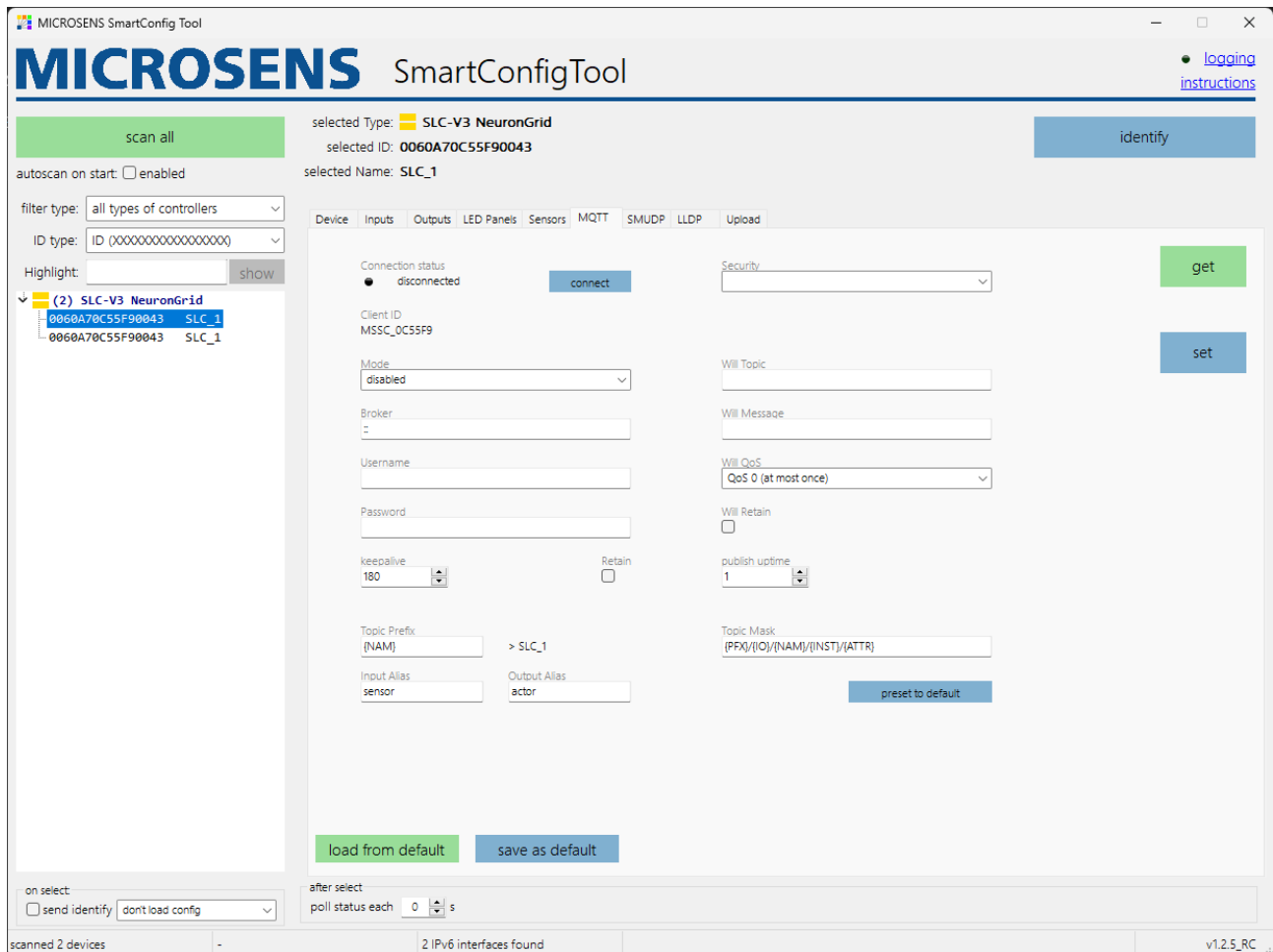


Figure 35. Smart Config Tool - MQTT Parameters

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 is 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 **Device** tab (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 to the broker at least once
    - storing and re-transmitting the message unless acknowledged by the broker
    - acknowledgement contains the unique packet ID of the received message, so the publisher can correlate the acknowledgement with the original message
  - QoS 2 (exactly once):
    - guarantee for delivering every message to the broker exactly once
    - publisher and broker use a four-part handshake for sending and acknowledgement
    - acknowledgement messages between broker and publisher contains the unique packet ID of the received message, so the acknowledgement can be correlated with the original message
- **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 the controller 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 to 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 a 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 that 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.

### 9.3. 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.



It is possible to use every UTF-8 character (besides "\$", "\*" or "?" since these characters are used for internal functions of the broker). For more information please read the documentation and websites on MQTT available online.

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".



The use of wildcards is allowed when using microScript to register topics. It is not allowed to use 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 along 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}/".



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



It is not recommended to use specific Device information in the topics like {MAC} or {SER}, because in the case of exchange of device, these topics will also change, which then results in the subscribed clients not receiving the information anymore.

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