

Installation and Operating Manual



for DALI Gateways LSG 4 DALI

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1. General

The Digital Addressable Lighting Interface (DALI) makes it possible, by using a bidirectional, serial, asynchronous data protocol, to control lighting control gear (electronic ballasts, power dimmers, LEDs, etc.) The control line can be installed using almost any network topology and has a maximum cable length of 300 m. This makes it possible to implement even complex lighting topologies without undue effort, especially since the two-core control line can be laid together with the supply line in a single cable (e.g. NYM 5 x 1.5 mm²).


Our DALI gateways make it possible to operate up to 64 DALI electronic ballasts on a single bus and these can be grouped together into up to 16 groups. Up to 16 storable lighting scenes make adjustments possible that cater for various lighting requirements in the planned application area.


Individual lighting groups can be dimmed between adjustable minimum and maximum values with configurable dimming speeds that can be separately set for each individual lighting group. Holding the dimming key down brightens and dims lighting cyclically with a one-second pause each time the brightening/dimming direction changes. Briefly pressing the key for a lighting group switches the lighting off or, if pressed again, the lighting is switched on to the previous dimming level (value stored in the memory). The value in the memory is lost if the power supply fails. This brightness change takes place at a separately configurable fading speed. This speed is also used to set central commands and the saved brightness levels of lighting scenes.

2. Usage and safety

The LSG 4 DALI was developed for open-loop control of control gear on a DALI lighting control bus. The unit switches the bus devices at brief intervals during configuration. You must therefore check in advance that the devices used are suitable for this purpose. This applies in particular to mercury vapour luminaires (HQL).

Please observe the following safety instructions in order to protect people as well as components:

-  **WARNING:** **electrical shock can cause serious burns and potentially fatal injuries.**
- » This control unit must only be installed and commissioned by an electrically qualified person.
 - » The applicable safety and accident prevention regulations must be observed.
 - » The unit must not be opened or operated other than in accordance with its technical specifications.
 - » Disconnect the unit from the power supply before working on it or replacing any connected control gear (switch the miniature circuit-breaker off).
 - » Using the DALI gateway to disconnect connected control gear from the supply is not sufficient.
 - » The terminals for the power supply and for the inputs must only be operated using voltages that meet the requirements for safety extra-low voltage (SELV) according to VDE 0100 Part 410.

- incorrect installation can damage the gateway and**
-  **WARNING:** **other system components and result in fires and other hazards.**

- » Note the wiring diagram.
- » The power supply adaptor must be within the immediate vicinity of the DALI gateway and should solely be used for powering one or more DALI gateways.
- » Applying mains voltage to the inputs/outputs or to the DALI bus will immediately damage the DALI gateway.
- » Do not use a shared cable for switch and power lines! Ensure adequate insulation where DALI circuits and power lines are laid together.
- » External DALI voltage sources must not be connected.
- » Only connect DALI devices to the DALI interface.
- » The USB port is intended solely for updating the system firmware. Do not connect anything to it unless you have been explicitly instructed to do so by the manufacturer.
- » Do not connect any other control units (master devices).
- » Note the maximum cable lengths and cross-sections.
- » Do not exceed the maximum number of components that can be connected.

3. Installation

The device is installed by snapping it onto a mounting rail. The patented snap-on system allows easy removal of the device from the mounting rail by sliding the housing upwards until it is released.

Note: every feedback function for a bidirectional input allows for a rated current of max. 50 mA. Only the operation of ohmic loads (neon lamps, LEDs) is permitted; inductive loads (relays etc.) are not permitted.

Note the wiring diagram during installation (see Section 9 “Wiring diagrams” on page 42). All cables that are to be connected must be de-energised. The table below shows the terminal assignments:

Terminal	Description	Terminal	Description
1.2	Input 1/feedback 1	2.3	Central on
1.6	Input 2/feedback 2	2.7	Central off
2.2	Input 3/feedback 3	4.3	DALI bus -
2.6	Input 4/feedback 4	4.7	DALI bus +
3.2	Input 5/feedback 5	1.4	Operating voltage 0 V DC
3.6	Input 6/feedback 6	1.8	Operating voltage 24 V DC
4.2	Input 7/feedback 7		
4.6	Input 8/feedback 8		

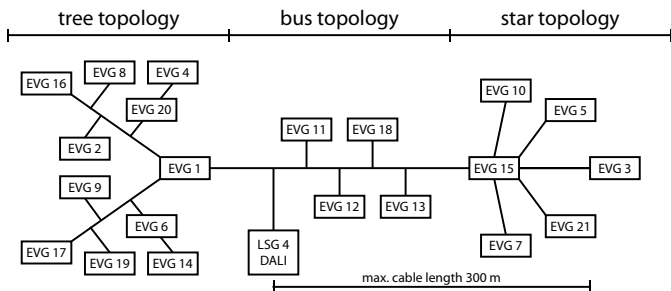
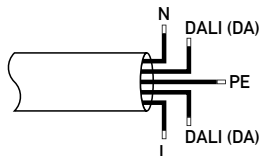
When connecting the components, ensure that the maximum torque at the terminals does not exceed 0.6 Nm.

To prevent unwanted feedback, uncoupling diodes 1N4007 must be provided when there is parallel switching of inputs. A sample circuit can be found in Section 9 “Wiring diagrams” on page 42.

3.1 Network topology

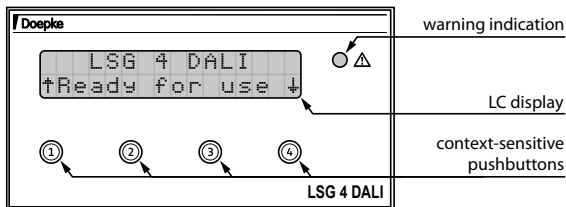
There is no need to take into account any specific network topologies. The only requirement is to avoid ring networks. It is possible to combine star or tree topologies with a linear topology. The network topology can be adapted to suit the layout of the building and be designed so as to optimise cable lengths. The DALI gateway can be positioned at any location in the network topology. Terminating resistors are not required.

The DALI bus line can be laid at the same time as conventional installation. The power supply for the lighting and the DALI bus line can even be routed together in a 5-core cable. The wires or cables that are used must be rated to handle the maximum prospective operating voltage. In the case of actuators, there is no need to observe the correct polarity of DALI bus lines. The maximum cable length can be up to 300 m if 1.5 mm² conductors are used. Nevertheless, where this entire cable length is utilised, avoid laying lines together with the power cable. Up to 64 actuators (electronic ballasts) are permitted per DALI bus; the maximum current consumption of the actuators must not exceed 200 mA. Please also note Section 2 "Usage and safety" on page 4.



4. Indicators and controls

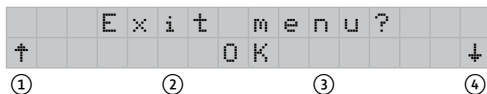
The gateway has the following controls and indicators:



Operation of the unit is completely menu-prompted via the LCD display. The functions of the keys depend on the particular menu item that is displayed at the time. Generally speaking, the keys are assigned as follows:

Explanation of symbols used	
↑	Show previous menu item
↓	Show next menu item
Esc	Quit menu item without saving
OK	Save setting and quit menu item

The menu structure generally gives you the option of quitting the menu and going to the next higher level:



Here you can quit the menu by pressing ② or ③ or select other menu items by pressing ① or ④.

4.1 *Display during normal operation*

The gateway displays several messages for information only during normal operation:

Message	Description
Ready for use	Gateway is configured and waiting for commands.
Teach-in device	Configuration is unaware of any device. This can be the case at the time of initial operation or after a factory reset. Perform a device search in the "Device setup" menu.

4.2 *Indicator LED*

The LED alongside the display is used to draw attention to specific operating states:

Message	Description
Continuously lit	Gateway is in manual mode or in configuration mode and is offline; it therefore does not respond to switch commands via the inputs or the Dupline bus.
Flashing 1/s	An error was detected. Possible error sources are described in the following section.

4.3 *Display of system and error messages*

The following messages may be output during operation or configuration:

Message	Description
DALI fault display ¹⁾	There is at least one fault on the DALI bus. Press the middle keys to confirm and access individual messages.
DALI bus idle	There is no active device on the bus. Inspect the control gear.
Device error	At least one control gear device is not responding. The display indicates the relevant device number. You can consult the numbers of other faulty devices by pressing the far-right key.
Lamp failure	At least one control gear device is reporting a lamp failure. The display indicates the relevant device number. You can consult the numbers of other devices affected by lamp failures by pressing the far-right key.
New dev detected	Gateway has detected at least one control gear device that has not yet been taught-in. Perform the "Search for new device" command in the "Device setup" menu.
DALI error short-circuit	The DALI bus's overcurrent monitoring has responded, usually due to a short-circuit. The gateway attempts to restart the bus roughly once every 10 s. This can result in a further temperature increase and cause subsequent errors.
DALI error overload	A DALI bus overload has been detected. This can be caused by excessive power being consumed by control gear or as a result of a short-circuit (see above). Check the bus for a possible short-circuit and ascertain the total power demand of all the devices. If applicable, replace any control gear that has an excessively high power demand.

¹⁾ These control gear faults are displayed during manual device diagnostics or if the "auto" diagnostic mode was selected in the system settings.

5. Commissioning

5.1 Function test without configuration

DALI devices must be taught-in and assigned to groups for normal commissioning. This step is essential. Nevertheless, you can test the installation and operating capability of devices and the gateway in two ways without having previously configured them:

1. By using the "Central on" and "Central off" key inputs; their wiring configuration can be found in Section 3 "Installation" on page 5.
2. By using the menu; refer to the description in Section 5.4 "Manual operation" on page 13.

5.2 Overview of configuration

In order to be able to make full use of all the functions of the DALI system, the DALI gateway must be configured. This procedure is described in detail in the following sections. The following paragraph only provides a brief description of commissioning.

5.2.1 Required configuration steps

The following actions *must* be performed:

1. Teach-in the connected DALI devices for the DALI gateway (see Section 5.5.3 "Repeating the teach-in for all devices" on page 19)
2. Create groups
 - a) Combine the devices into groups (16 groups max.) (see Section 5.6.2 "Creating, configuring or working on lighting groups" on page 21)
 - b) Link the groups to an input (terminal) of the DALI gateway (see Section 5.6 "Organising lighting groups" on page 20)

5.2.2 *Optional configuration steps*

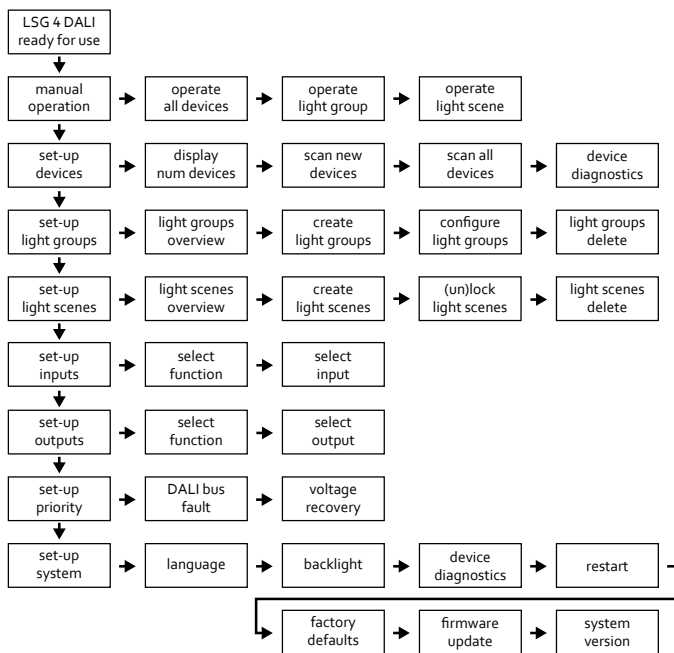
The following functions *may* be selected:

1. Feedback from active groups (when lighting > 0 %, see Section 5.6.2 “Creating, configuring or working on lighting groups” on page 21): Active groups can be displayed via switch outputs for the DALI gateway. To do this, the groups must be linked to feedback outputs.
2. Saving lighting scenes
 - a) Combine the groups into lighting scenes (16 scenes max.) (see Section 5.7.2 “Creating lighting scenes” on page 29)
 - b) Link the lighting scenes to an input (terminal) of the DALI gateway

Individual group parameters are factory defaults but the following values can be adjusted separately for each group:

1. Minimum brightness down to which lighting should be dimmed (see Section 5.6.3 “Configuring lighting groups” on page 24)
2. Maximum brightness up to which lighting should be brightened
3. Dimming speed for manual smooth adjustment of lighting (see Section 8.2 “Dimming/fade speeds” on page 41)
4. Fade speed when changing the brightness by calling up lighting scenes and central commands (see Section 8.2 “Dimming/fade speeds” on page 41)

5.3 Menu structure



5.4 Manual operation

Manual mode makes it possible to operate devices, groups and lighting scenes directly via the DALI gateway's menu.

5.4.1 Switching devices on and off

To make it simple to commission and/or check the lighting, this menu item can be used to switch all devices off by pressing key ② or switch all devices on by pressing key ③, even without having previously configured the DALI gateway.

	A	L	L	d	e	v	i	c	e	s		
↑		o	n		o	f	f					↓
①		②		③								④

All control gear is addressed by broadcast commands by activating the "Central on" or "Central off" function. This function is equivalent to actuating the "Central on" and "Central off" key inputs. The "Central on" command calls up the maximum brightness which can be < 100 %, whereas the "Central off" command switches the electronic ballasts off (0 %). These values are set together with the fading speed.

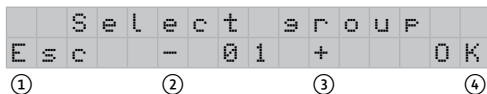
Note: the parameters for minimum and maximum brightness and for dimming and fade speeds are preconfigured by the manufacturer in the case of brand-new electronic ballasts. If there are different types of electronic ballasts, this can therefore result in different ultimate brightness levels being reached within different times. These values are only overwritten by the settings made by the user when the gateway is actually configured.

5.4.2 Switching a group on/off and dimming/brightening a group

Note: you cannot operate groups unless they have previously been configured.

	L	i	g	h	t	g	r	o	u	p		
↑		O	p	e	r	a	t	e				↓
①		②		③								④

Pressing ① or ④ selects the function to be performed. Pressing ② or ③ brings up the *Operate group* menu item.



Press ② or ③ to select the required group and press ④ to confirm. Only groups that actually exist are displayed.

Example: select group 04 -> OK



Group 04 is selected. The brightness value currently set for this group is 145; the maximum brightness level is 254.

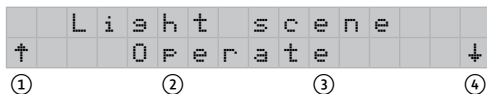
Pressing key ① takes you back to the *Select group* menu. The functions *on* (②), *off* (③) and *dim* (④) apply to the entire group.

Note: the actual brightness of the lamp depends on the particular electronic ballast that is used. An identical illuminance can only be achieved by using the same types of equipment (ballast and lamp).

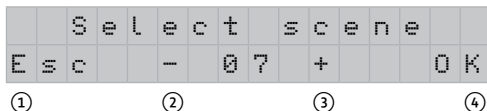
The group is smoothly adjusted (key ④) between the minimum and maximum dimming level at the previously set dimming speed (settings under *Configure DALI group*, see Section 8.2 "Dimming/fade speeds" on page 41). Holding the dimming key down brightens and dims lighting cyclically with a one-second pause each time the brightening/dimming direction changes.

5.4.3 Calling up and saving a lighting scene

Note: you cannot operate lighting scenes unless they have previously been configured.



Pressing ② or ③ brings up the *Operate lighting scene* menu item.



Press ② or ③ to select the required lighting scene and press ④ to confirm. Only lighting scenes that actually exist are displayed.

Example: select lighting scene 07 -> OK

Note: even a disabled lighting scene can be saved.



Lighting scene 07 is selected. Pressing ① takes you back to the *Select scene* menu, pressing ② calls up the lighting scene that consists of previously defined groups. Pressing ③ saves the current brightness values of the associated groups as a lighting scene – in memory location 07 in this case.

5.5 Logging devices in and out

To ensure that the gateway can communicate with connected DALI control gear and electronic ballasts, a one-off teach-in process must be performed. Each device is given a (short) address ranging from 1 to 64. This address is assigned randomly and cannot be altered. If you want to organise lighting groups at a later time, you can note down the addresses of the devices here or at any time when groups are

being created or worked on, see Section 5.5.1 "Device information" on page 17.

During the teach-in process, the gateway dims all the devices that it has not yet learned up to maximum brightness and dims any devices that it has learned down to minimum brightness. Devices that are found (newly learned) are also dimmed down to minimum brightness so that, once the teach-in process has completed successfully, all devices should be dimmed down to minimum brightness.

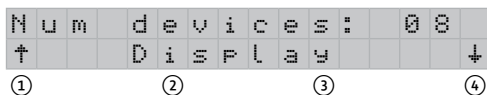
At the end of the teach-in process data is transferred to the devices ("**Note:** data transfer/please wait"). It is then possible to assign the groups to lighting scenes.

Select the following menu item in order to teach-in all devices or new devices:

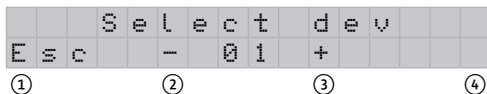


5.5.1 Device information

The first menu item gives you an overview of the number of devices that have currently been taught-in and also makes it possible to identify devices:



If – as in this case – one or more devices have been taught-in, the word "display" appears, thus making it possible to access the submenu for identifying devices by pressing key ② or ③:



Here you can use the middle keys to select a device, it is switched on immediately by the gateway as soon as it is selected. You can then note down the device number in order to subsequently create groups and scenes.

5.5.2 Searching for new devices

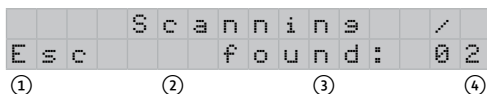
Select the following menu item if you have:

- » connected new devices to the DALI bus,
- » received the "New device detected" diagnostic message or
- » removed devices from the DALI bus.

The gateway rebuilds the device list without altering any group or scene affiliations for devices that have not changed. To do this, in the following display press keys ② or ③ for at least five seconds:



The number of electronic ballasts that have already been found is shown on the display during this search. Searching is indicated by a rotating bar in the top right of the display area.



Note: finding all devices can take several minutes. Devices are not automatically assigned to groups.

Finally, data is transferred to the devices and the gateway displays the number of logged-out (-) and newly learned (+) devices.

Example: this search finds that two control gear devices have been removed (-) and one new control gear device has been added (+).

D	e	v	s	:	-	0	2	/	+	0	1
E	s	c									

①

②

③

④

Pressing ① takes you back to the *Number of devices* menu item

5.5.3 Repeating the teach-in for all devices

Select the following menu item if the gateway displays the message "Teach-in device", i. e. it is set to the factory defaults or you want to build an entirely new configuration.

When this function is selected, the gateway deletes the list of all known control gear and rebuilds it. In doing so, all lighting groups and lighting scenes are reset. To do this, in the following display press keys ② or ③ for at least five seconds:

S	c	a	n	a	l	l	d	e	v	s	?
↑		S	t	a	r	t	5	s			↓

①

②

③

④

The number of control gear devices that have already been found is shown on the display during this search process. Searching is indicated by a rotating bar in the top right of the display area.

			S	c	a	n	n	i	n	g	/	
E	s	c			f	o	u	n	d	:	1	2

①

②

③

④

Note: finding all devices can take several minutes. Devices are not automatically assigned to groups.

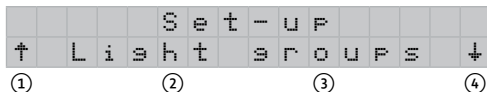
Data is then transferred to the devices and the user is automatically taken back to the "Number of devices" menu item.

5.5.4 Device diagnostics

Detailed diagnostic information for devices can be obtained in the "Dev diagnostics" submenu. After pressing one of the middle keys ("Start"), the message "No error" appears or one or more messages as shown in Section 4.3 "Display of system and error messages" on page 9 appear. You can enable the automatic display of diagnostic information during operation in the system settings under "Dev diagnostics".

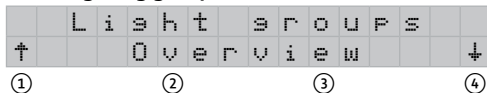
5.6 Organising lighting groups

The gateway supports the use of up to 16 lighting groups as provided for in the DALI specification. The composition of the groups, the assignment of control inputs and feedback outputs and their configuration can be defined in the "Lighting group setup" menu.



Note: if you have not yet taught-in any device, "Teach-in device" appears briefly instead. In this case, first teach-in the connected control gear as described in Section 5.5 "Logging devices in and out" on page 16.

5.6.1 Lighting group overview



The status of groups 1 to 16 is displayed in the *Group overview* menu:

Explanation of symbols used	
-	No group created
x	Group created, no control address assigned
1	Group created, control address assigned

1	1	-	x	-	-	-	-	-	-	-	-	-	-	-	-
E	s	c													
①			②												④

Pressing ① takes you back to the Group mode menu.

5.6.2 Creating, configuring or working on lighting groups

This menu item lets you create or work on lighting groups:

		L	i	g	h	t		g	r	o	u	p	s		
↑				C	r	e	a	t	e						↓
①				②											④

Pressing key ② or ③ brings up the menu for creating a lighting group.

		S	e	l	e	c	t		g	r	o	u	p		
E	s	c		-	0	4		+	*		O	K			
①				②											④

Then press ② or ③ to select the group that is to be created or worked on. If a group already exists, it is identified by "*" and the devices of that group flash.

Note: Inputs and outputs do not affect each other even though they share a terminal. The output for feedback can therefore be freely selected, regardless of the function of the input. For example, a terminal can be used as an input for recalling a lighting scene and as an output for providing feedback about the status of a lighting group at the same time.

Assigning an input

To allow subsequent activation, e.g. using a momentary-action switch, an input must then be assigned to the lighting group. Select the input by pressing ② and ③ and confirm it by pressing ④:

Gr: 04 /	i n P u t		
Esc	- 01 + *	OK	
①	②	③	④

Group 4 and input 1 are selected in this example.

Assignment status	
*	The displayed input is currently assigned to the group.
!	The input is already being used for a different group or scene. If you nevertheless opt to enter this data, the gateway deletes the previous assignment.

Assigning an output (feedback)

The next step allows you to assign the group feedback, if desired, using an output. Select the output by pressing ② and ③ and confirm it by pressing ④:

F - Gr: 04 /	o u t P u t		
Esc	- 01 + *	OK	
①	②	③	④

Assignment status	
*	Currently assigned output
!	The output is already being used for a different group. If you nevertheless select this output, the gateway deletes the previous assignment.

If you do not want any feedback, select "--".

Assigning devices

The next step allows you to assign devices to the selected group. The gateway identifies devices that have already been assigned by brightening them to their maximum value. Pressing ② and ③ selects a control gear device which is identified by flashing and pressing ④ confirms it:

			S	e	l	e	c	t		d	e	v			
E	s	c		-	0	7				+	!			O	K
①				②						③					④

Assignment status

*	The device is already assigned to the group.
!	The device is already assigned it to a different group.

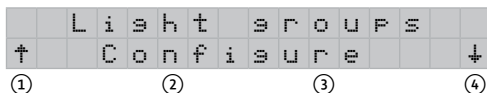
After confirming the device number by pressing key ④, you can add the currently selected device to the group (key ③) or, if it already exists, remove it (key ②). In every case you are taken back to the above menu item via which you can terminate the entire procedure.

D	e	v	:	0	7					+		s	r	:	0	4
E	s	c		r	e	m				a	d	d				
①				②						③						④

5.6.3 Configuring lighting groups

The following group parameters can be set separately for each lighting group:

1. Minimum brightness down to which lighting should be dimmed
2. Maximum brightness up to which lighting should be brightened
3. Dimming speed during manual smooth adjustment of lighting
4. Fade speed when changing lighting scenes and issuing central commands



Pressing key ② or ③ brings up the menu for configuring a lighting group.



Pressing ② and ③ selects the lighting group that is to be configured or all the lighting groups. After confirming by pressing ④, you can adjust the individual settings for the lighting group.

Minimum/maximum brightness

The minimum and maximum brightness levels are set in accordance with a logarithmic function (see Section 8.1 “Dimming level setup” on page 40). Smooth adjustment is nevertheless perceived as being even because the sensitivity of the human eye is also logarithmic.

The minimum values depend, however, on the control gear: LEDs, for example, can be dimmed down to a value of 1, but this value can be as high as 128 in the case of an electronic ballast for fluorescent lamps due to technical system properties.

Gr:	02	/	Min-Dim
Esc	-128	+	OK
①	②	③	④

Pressing ② and ③ configures the minimum dimming level from 1 (0.1 %) to 221 (40 %) (factory default is 128). After confirming by pressing ④, this value is adopted and the next menu appears. Pressing ① takes you back to the higher-level menu.

Gr:	02	/	Max-Dim
Esc	-254	+	OK
①	②	③	④

Pressing ② and ③ configures the maximum dimming level from 229 (50 %) to 254 (100 %) (factory default is 254). After confirming by pressing ④, this value is adopted and the next menu appears. Pressing ① takes you back to the higher-level menu.

Note: the relevant group indicates the currently set dimming level. If electronic ballasts do not support the previously set value, there may be no recognisable changes in brightness.

Dimming time

The dimming time is, according to the specification, the dimming speed during manual smooth adjustment (fade rate), and is defined as the number of dimming increments (brightness levels) per second:

Dimming levels					
1	357.8	6	63.3	11	11.2
2	253.0	7	44.7	12	7.9
3	178.9	8	31.6	13	5.6
4	126.5	9	22.4	14	3.9
5	89.5	10	15.8	15	2.8

The higher this number is (between 1 and 15), the more slowly the device dims or brightens. In relation to the maximum brightness range (0–254), fade times also apply (see below).

```
Gr: 02 / Dim - Time
Esc - 08 + OK
①      ②      ③      ④
```

Pressing ② and ③ configures the dimming time (factory default is 8). After confirming by pressing ④, this value is adopted and the next menu appears. Pressing ① takes you back to the higher-level menu.

Fade time

By setting the fade time, you can define the period within which each device in the group must reach the saved value for a lighting scene. Devices use the fade time and their current and required desired brightness to calculate the dimming speed. This ensures all devices complete the dimming process at the same time, assuming they all support the minimum/maximum values in question. The table below provides an overview of the dependence between levels and times:

Fade levels					
1	0.7 s	6	4.0 s	11	22.6 s
2	1.0 s	7	5.7 s	12	32.0 s
3	1.4 s	8	8.0 s	13	45.3 s
4	2.0 s	9	11.3 s	14	64.0 s
5	2.8 s	10	16.0 s	15	90.5 s

The fade time is set in the subsequent dialogue:

```
Gr: 02 / Fade time
Esc - 05 + OK
①      ②      ③      ④
```

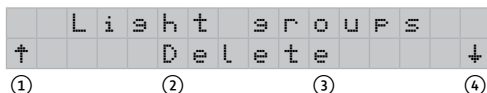
Pressing ② and ③ configures the fade time (factory default is 5). After confirming by pressing ④, this value is adopted and the next menu appears. Pressing ① takes you back to the higher-level menu.

5.6.4 Deleting lighting groups

This menu item enables you to delete lighting groups. Please note:

- » when groups are deleted, devices may sometimes lose their assignment and it may no longer be possible to address them.
- » The inputs and feedback outputs of affected groups no longer respond.
- » Groups are deleted from previously defined lighting scenes and are no longer addressed by them.

Select the following menu item by pressing key ② or ③:



Then select the group that is to be deleted (group number or "all"):



Confirm deletion by answering "Yes" or quit by pressing "Esc" or answering "No".

5.7 Organising lighting scenes

The gateway can be used to store and retrieve up to 16 lighting scenes – consisting of the brightness states of individual lighting groups.

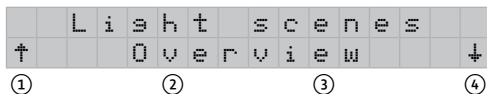
When configuring lighting scenes, the lighting groups whose brightness levels are to be taken into account by the lighting scenes must first be selected. A lighting scene must comprise at least one lighting group.

Lighting scenes can then be linked together by using the DALI gateway's inputs.

Note: you must also include groups that are to be switched off in a lighting scene in the relevant lighting scene.

Example: three different lighting scenes are to be produced in a room – they comprise four lighting groups. Three lighting scenes that in turn comprise the corresponding four lighting groups are required. In this case it is sensible for all the lighting scenes to comprise the same lighting groups. In another room, however, independent lighting scenes can be created using different lighting groups.

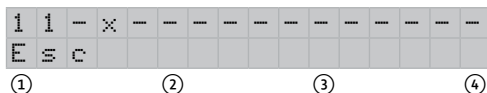
If Scene mode is selected on the display, the following submenu first appears:



Select the desired menu item by pressing ① and ④.

5.7.1 Lighting scene overview

If the overview is activated by pressing ② or ③, the status of the 16 possible lighting scenes is displayed on the top line consecutively from left (lighting scene 1) to right (lighting scene 16).



Explanation of symbols used	
—	Scene has not been defined.
×	Scene has been defined but no input has been assigned (cannot be used).
1	Scene has been defined and an input has been assigned.

Pressing ① takes you back to the *Lighting scene overview* menu.

5.7.2 Creating lighting scenes

To create a lighting scene, assign it a number and an activation input.

	L	i	g	h	t	s	c	e	n	e	s	
↑			C	r	e	a	t	e				↓
①			②				③					④

Pressing key ② or ③ brings up the menu for creating a DALI scene.

	S	e	l	e	c	t	s	c	e	n	e	
Esc		-	0	4	+	*					OK	
①			②				③				④	

Lighting scene status	
*	Identifies lighting scenes that have already been created

Pressing key ② or ③ selects the desired lighting scene number to which the lighting scene is to be assigned. Pressing ④ confirms your choice.

Sc:	0	4	/	i	n	p	u	t			
Esc		-	0	2	+	!					OK
①			②				③				④

Input status	
!	Input has already been used in a different function.
*	The displayed input is currently assigned to the scene.

Pressing key ② or ③ selects the input which is to be assigned to the lighting scene. Pressing ④ confirms this input assignment.

Then select one or all the groups that you want to add to the scene or remove from the scene:

```
  S e l e c t   g r o u p
E s c   -   0 2   +   *   O K
①           ②           ③           ④
```

In the following dialogue, decide which action you want to perform:

```
  G r : 0 2   +   S c : 0 4
E s c   r e m   a d d
①           ②           ③           ④
```

Choosing "rem" deletes group 2 from the scene; choosing "add" adds it to the scene.

When you have added one or all the groups, the gateway prompts you to specify the light settings for the groups:

```
  G r : 0 2   /   a c t : 1 2 8
o n   o f f   d i m   O K
①           ②           ③           ④
```

Key assignment

①	on	Defines the light setting for the selected group in this scene as the maximum value.
②	off	Defines the light setting for the selected group in this scene as 0%.
③	dim	Brings up the submenu for setting the dimming level.
④	OK	Saves the current brightness setting.

Select "Dim" in order to precisely set the light setting for the group in the following menu:

Gr: 02	/	act: 128
dim -		+ OK
①	②	③ ④

Key assignment		
①	dim	Increases or reduces the brightness of the group.
②	-	Reduces the brightness of the group incrementally.
③	+	Increases the brightness of the group incrementally.
④	OK	Saves the current lighting setting for the group in the lighting scene.

Note that you can only ever adjust the brightness value within the range of the minimum and maximum values that have been preconfigured for the lighting group (default factory range is 128 to 254). You can adjust these values to suit the type of luminaire in the "Lighting group settings" - "Configure lighting groups" menu (see "Minimum/maximum brightness" on page 24).

5.7.3 Disabling/enabling a lighting scene

In order to disable or enable the storage of lighting scenes by using external control keys, you have to select this menu option.

↑	Light scenes	↓
①	(un)lock	④

Pressing ② or ③ selects the *Disable/enable* menu item.

Esc	Light scene	OK
①	unlocked	④

Pressing ② or ③ selects the desired status (disabled/enabled). Pressing ① quits the menu without saving the previously set status and pressing

④ accepts the displayed status. When a lighting scene is disabled, external keys cannot be used to save any lighting scenes.

5.7.4 Deleting lighting scenes

This menu item enables you to delete lighting scenes:



First select the individual lighting scene or all the lighting scenes that you want to delete:



Confirm deletion of the lighting scene(s) by answering "Yes" or quit by pressing "Esc" or answering "No" in the subsequent dialogue.

5.8 Directly assigning inputs

The gateway offers you a time-saving way of assigning inputs directly to lighting scenes or lighting groups without having to switch to *Group mode* or *Scene mode*. Bring up the following menu item:



Pressing ② or ③ takes you to the following menu:



Press ② or ③ to select the group "Gr" or lighting scene "Sc" in which a change is to be made. Only those groups and/or scenes that have already

been allocated are shown. An exclamation mark denotes that an input has already been assigned to this group. Pressing ④ selects the item and takes you to the menu in which the change can be made.

	S	e	l	e	c	t	i	n	p	u	t	
Esc		-	0	2	+	*					OK	
①		②		③							④	

Assignment status	
*	Currently assigned input
!	The input is already being used for a different group or scene. If you nevertheless opt to enter this data, the gateway deletes the previous assignment.

Pressing ② or ③ selects an input to be assigned to the group or scene. Pressing ④ saves the current choice; pressing ① takes you back to the previous menu without saving.

5.9 Directly assigning outputs

The gateway offers you a time-saving way of assigning outputs directly to lighting groups without having to change to *Group mode*. Bring up the following menu item:

		S	e	t	-	u	p		
↑		O	u	t	p	u	t	s	↓
①		②		③					④

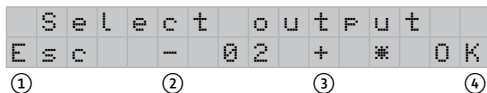
Pressing ② or ③ takes you to the following menu:

	S	e	l	e	c	t	f	u	n	c	t	i	o	n
Esc		G	r	:	0	4		!				OK		
①		②		③								④		

Pressing ② or ③ selects the group "Gr" to which you want to assign a different output. Only those groups that have already been allocated are

shown. An exclamation mark denotes that an output has already been assigned to this group.

Pressing ④ selects the item and takes you to the menu in which the change can be made:



Assignment status	
*	Currently assigned output
!	The output is already being used for a different group. If you nevertheless select this output, the gateway deletes the previous assignment.

Pressing ② or ③ selects an output to be assigned to the group or scene. Pressing ④ saves the current choice; pressing ① takes you back to the previous menu without saving.

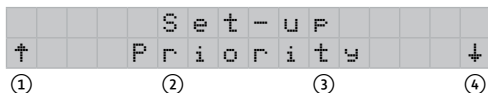
Note: the output assignment and the input assignment on the same terminal do not affect each other. Terminal 1 can be used to control lighting scene 5 (input 1) and the feedback for lighting group 3 (output 1).

5.10 Configuring the response to faults

In order to ensure the lamp is in a defined operating state after a power supply failure (restoration of supply) or a fault in the DALI bus (DALI bus fault), presets can be defined for both types of faults. The options are as follows:

- » 0 %..... The electronic ballast is switched off
- » 50 %..... The brightness of the electronic ballast is reduced to 50 %
- » 100 %..... All the electronic ballasts are switched on

To do this, select the following menu item by pressing key ② or ③:



5.10.1 Response in the event of a DALI bus fault

Every DALI control gear device makes it possible to specify and save a brightness value that must be assumed in the event of a fault on the DALI bus. You can specify this value in the following menu item:



Pressing key ② or ③ then selects the brightness. Pressing key ① or ④ takes you to the other priority settings or to the display for quitting the submenu.

5.10.2 Response when power supply is restored

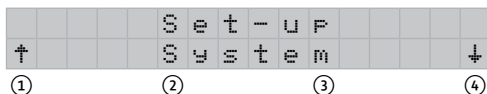
Every DALI control gear device makes it possible to specify and save a brightness value that must be assumed when the device's operating voltage is restored. You can specify this value in the following menu item:



Pressing key ② or ③ then selects the brightness. Pressing key ① or ④ takes you to the other priority settings or to the display for quitting the submenu.

5.11 System settings

In the following menu which can be accessed by pressing key ② or ③, you can specify basic settings for the gateway:



Select the configurable options by pressing key ① or ④ and define the corresponding setting by pressing key ② or ③. Note that changes are only made and saved once you have quit the menu.

The following options are available (factory defaults are shown in bold):

Option	Selection	Description
Language	deutsch english	Menu language setup
Backlight		Display backlighting
	auto	Switched on for approx. 60 s when a key is operated
	on	Always switched on
Dev diagnostics		Defines how diagnostics are performed on control gear:
	manual	You can only run diagnostics manually in the "Device diagnostics" menu ("Device setup" main menu), see "Device diagnostics" on page 20.
	auto	Diagnostics run in the background. As soon as at least one device reports an error, it is indicated on the display.
Restart	Start 5 s	Restart the unit: if the key is held down, the unit counts down and restarts at 0 s.
Factory default	Start 5 s	Reset to factory default: if the key is held down, the unit counts down and resets the settings to the unit's original status upon delivery at 0 s.
Firmware update	Start 5 s	Launch firmware update: if the key is held down, the unit counts down and switches to software update mode ¹⁾ at 0 s.
System Version	Vx.yz	Shows the unit's current firmware version
Save settings?		Defines whether the new data is to be saved:
	yes	Saves the new settings
	no	Discards the new settings

¹⁾This menu item must only be used when the user is explicitly instructed to do so by Doepke Schaltgeräte GmbH.

6. Warranty

All professionally installed, unaltered devices are covered by warranty during the statutory guarantee period from the day of purchase by the end user. The warranty is not applicable to damage incurred during transport or caused by short-circuit, overloading or improper use. In the event of defects in workmanship or material, which are discovered within the warranty period, the company will provide repair or replacement free of charge. The warranty will be rendered null and void if the device is opened without authorisation.

7. Technical data

LSG 4 DALI		minimum	typical	maximum
DALI				
Output voltage (SELV ¹ , short-circuit-proof)		11.5 V DC	16.5 V DC	17 V DC
Nominal current				128 mA
Short-circuit disconnection				200 mA
Cable lengths	0.5 mm ²			100 m
	0.75 mm ²			150 m
	1.0 mm ²			200 m
	1.5 mm ²			300 m
Number of devices				64
Display				
Type	Alphanumeric liquid crystal display (LCD)			
Display format	2 lines with 16 characters each			
Display size	43.9 x 10.0 (W x H in mm)			
Backlighting	LED, can be switched off			
Fault indicator	Red LED			
Controls				
Type	4 navigation keys			

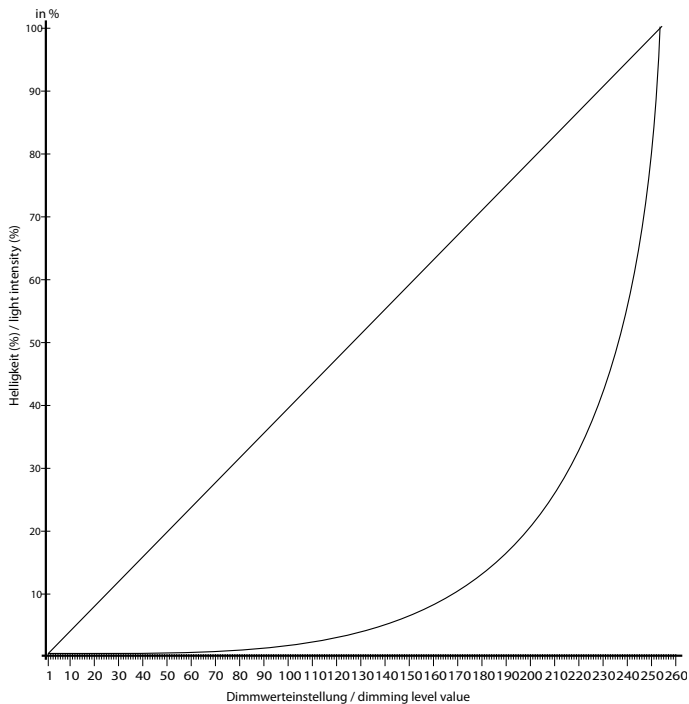
¹ Only applies if entire installation is carried out in accordance with requirements for SELV, acc. to VDE 0100 Part 410 | ² In case of up to 10 inputs wired in parallel and a Ø of 0.6 mm | ³ Without DALI devices

LSG 4 DALI	minimum	typical	maximum
Inputs			
Type	10 semiconductor inputs		
Nominal operating voltage	21.5 V DC	24 V DC	26.5 V DC
Current consumption	3.6 mA	4.2 mA	4.7 mA
Cable lengths	1000 m ²⁾		
Outputs			
Type	8 semiconductor outputs (pulsed)		
Voltage	21.5 V DC	24 V DC	26.5 V DC
Nominal current	50 mA		
Operating voltage			
Nominal operating voltage (SELV)	21.5 V DC	24 V DC	26.5 V DC
Current consumption ³⁾	28 mA	30 mA	33 mA
Permissible ripple voltage	100 mVpp		
Terminals			
Type	Screw terminal with strain-relief clamp		
Clamping area	0.4 mm Ø	2.5 mm ²	
Torque	0.6 Nm		
Housing			
Type	Distribution board housing for installation on mounting rail		
Dimensions	72 x 85 x 58 (W x H x D in mm) / 4 module widths		
Material	Polycarbonate (PC)		
General			
Operating temperature	-10 °C	+45 °C	
Humidity	85 % max. (no condensation)		
Protection class/standards	IP20, EN 60669-2-1, EN 50428, EN 50491-3/-4-1/5-1/5-2, EN 60929, EN 62386-101/-103		
Order number	09500243		

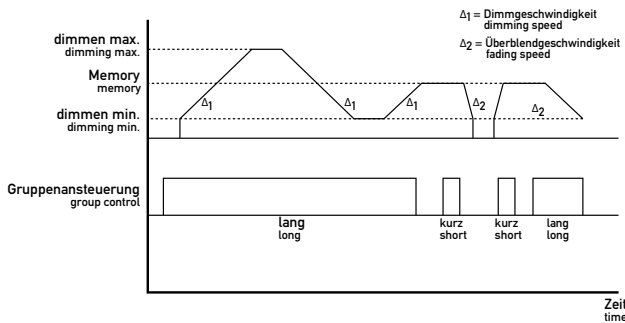
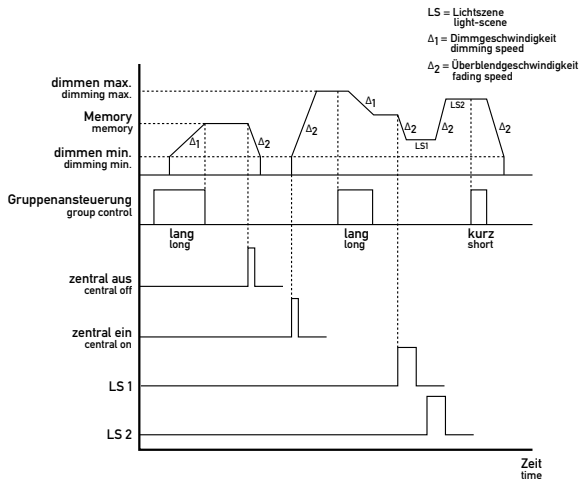
¹ Only applies if entire installation is carried out in accordance with requirements for SELV, acc. to VDE 0100 Part 410 | ² In case of up to 10 inputs wired in parallel and a Ø of 0.6 mm | ³ Without DALI devices

8. Diagrams

8.1 Dimming level setup



8.2 Dimming/fade speeds



9. Wiring diagrams

