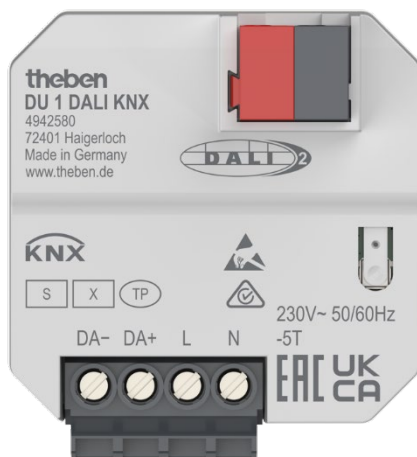


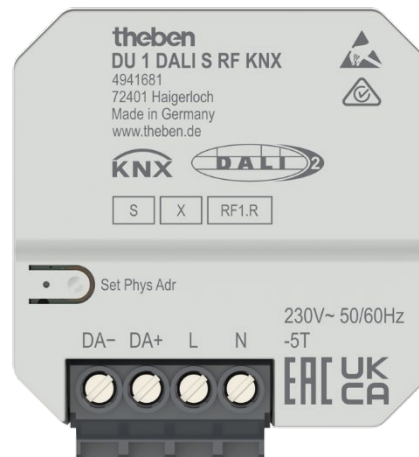
KNX Manual

Flush-mounted DALI Broadcast Controller

DU 1 DALI KNX, DU 1 DALI RF KNX



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Contents

1	✂ IMPORTANT WARNINGS DU 1 DALI S RF KNX!	3
2	Features	4
3	Technical data	5
	3.1 Important information	6
4	Operation	7
	4.1 Reset	7
5	General information about KNX Secure	8
	5.1 Start-up with "KNX Data Secure"	9
	5.2 Start-up without "KNX Data Secure"	9
6	General information about DALI	10
	6.1 DALI system description	10
	6.2 Schematic diagram	11
	6.3 Response of DALI participants to EB operating voltage failure	11
	6.4 Response of DALI participants at restoration of EB operating voltage	11
7	The DU 1 DALI KNX application programme	12
	7.1 Selection in the product database	12
	7.2 Overview of communication objects	13
	7.3 Description of communication objects	17
	7.4 Parameter pages overview	27
	7.5 General parameters	28
	7.6 Parameters for the DALI actuator	29
	7.7 Parameters for the external inputs I1, I2 purely as KNX binary inputs	45
	7.8 Parameters for direct control of the dimming actuator	62
8	Application examples	67
	8.1 Direct control: Basic configuration	67
	8.2 Controlling the dimming channel via the bus	69
9	Appendix	72
	9.1 Priority order	72
	9.2 Using the soft switch function	73
	9.3 Using the force function	79
	9.4 DALI EB	80
	9.5 4-bit telegrams (brighter/darker)	80
	9.6 Scenes	82
	9.7 Conversion of percentages to hexadecimal and decimal values	86

1 ⚡ IMPORTANT WARNINGS DU 1 DALI S RF KNX!



Danger of electric shock!

- The device does not have basic insulation around the terminals and plug connection!
- The inputs carry mains voltage!
- When connecting the inputs or before any intervention at one of the inputs, interrupt the 230 V supply of the device.
- Protect against accidental contact during installation.
- Maintain a minimum distance of 3 mm from live parts or use additional insulation, e.g. separating strips/walls.
- Do not remove the insulation from the unused inputs.
- Do not cut off the conductors of the unused inputs.
- Do not connect mains voltage (230 V) or other external voltages to the inputs!
- During installation, ensure there is adequate insulation between mains voltage (230 V) and bus or inputs (min. 5.5 mm).

2 Features

- DALI actuator 1 DALI output
- Parallel connection of DALI operating devices at the output
- Channel-dependent communication via broadcast commands.
- No individual or group control of DALI operating devices
- Provides DALI voltage for output
- Switching
- Soft switching
- Dimming (relative, absolute, dimming curve, dimming time, ...)
- Colour control (RGB, RGBW, colour temperature)
- Participation in central objects
- Scenes (8 scene memories)
- Block function
- Force function
- Hour counter and service
- Diagnostic messages
- Configuration and start-up via ETS
- Support of KNX Data Secure
- Power supply via mains connection

3 Technical data

Operating voltage	230 V AC, +10% / -15%
Frequency	50 – 60 Hz
Power consumption standby	DU 1 DALI KNX: 0.35 W DU 1 DALI S RF KNX: 0.7 W
Power consumption KNX ¹	5 mA
KNX operating voltage ²	21 – 32 V
Dimensions W x H x D	DU 1 DALI KNX: 44.4 x 48.6 x 32.3 mm DU 1 DALI S RF KNX: 44.4 x 48.6 x 24.9 mm
Permissible ambient temperature	-5 °C ... +45°C
Protection rating	IP20
Protection class	II subject to designated installation
Type of installation	Flush-mounting
Type of connection	Screw terminal bus connection: KNX bus terminal ³
Max. terminal cross section	Solid: 0.5 mm ² (Ø 0.8 mm) to 4 mm ² Stranded wire with ferrule: 0.5 mm ² to 2.5 mm ²
Number of channels	1
Max. current	60 mA
Status display	No
DU 1 DALI S RF KNX	
Wireless standard ⁴	RF1.R
Transmission frequency	868.3 MHz
Transmission power	< 10 mW
Coding	FSK (Frequency Shift Keying)
Transceiver type	bidirectional

¹ DU 1 DALI KNX

² DU 1 DALI KNX

³ DU 1 DALI KNX

⁴ Wireless properties: DU 1 DALI S RF KNX

3.1 Important information

-
- ① The DALI actuator controls devices with DALI interface (e.g. EBs, LED converters, transformers, etc.).
 - ① The device is a **Single Master Application Controller** (according to EN 62386-103), i.e. it is only allowed to be operated in DALI segments with connected EBs, and **not** with other DALI control devices within the segment (no multi master operation).
 - ① Up to 30 DALI participants can be connected to the DALI output. The DALI participants are addressed via broadcast commands. Addressing or grouping of the DALI devices is not necessary.
 - ① The DALI actuator acts as an interface between the DALI system and the KNX bus. For switching and dimming the connected DALI devices.
 - ① For the entire DALI installation of a segment, a maximum cable length of 300 m must not be exceeded (Ø 1.5 mm²).
 - ① The mains voltage is connected according to the printing on the housing (L and N). The connection to the KNX bus is established with the KNX plug-in terminal. The lines of the DALI segments are connected to terminals DA+, DA-.
-

4 Operation

4.1 Reset

The devices can be reset to factory settings as follows:

ETS:

Select the device in the ETS and right-click to select 'Unload' - 'Physical address & application'.

Supply voltage & programming button:

Switch off the supply voltage, press and hold the programming button, switch on the supply voltage, hold the programming button for a further 5 seconds and then release it again.

Programming button:

Press the programming button for 5-10 seconds until the programming LED flashes. Release the programming button (max. 3 seconds) and press again for approx. 5 seconds until the programming LED flashes rapidly. Release the programming button.



Important note:

When resetting to factory settings, all saved information is deleted (physical address, group addresses, parameter settings, keys generated by the ETS (tool key and runtime key) for secure communication).

5 General information about KNX Secure

ETS5 Version 5.5 and higher support secure communication in KNX systems. A distinction is made between secure communication via the IP medium using KNX IP Secure and secure communication via the TP and RF media using KNX Data Secure. The following information refers to KNX Data Secure.

In the ETS catalogue, KNX products supporting “KNX Secure” are clearly marked. 

As soon as a “KNX-Secure” device is included in the project, the ETS requests a project password. If no password is entered, the device is included with Secure Mode deactivated. However, the password can also be entered or changed later in the project overview.

5.1 Start-up with "KNX Data Secure"

For secure communication, the FDSK (Factory Device Setup Key) is required. If a KNX product supporting "KNX Data Secure" is included in a line, the ETS requires the input of the FDSK. This device-specific key is printed on the device label and can either be entered by keyboard or read by using a code scanner or notebook camera.

Example of FDSK on device label:



After entering the FDSK, the ETS generates a device-specific tool key. The ETS sends the tool key to the device to be configured via the bus. The transmission is encrypted and authenticated with the original and previously entered FDSK key. Neither the tool key nor the FDSK key are sent in plain text via the bus.

After the previous action, the device only accepts the tool key for further communication with the ETS.

The FDSK key is no longer used for further communication, unless the device is reset to the factory setting: In this case, all set safety-related data will be deleted.

The ETS generates as many runtime keys as needed for the group communication you want to protect. The ETS sends the runtime keys to the device to be configured via the bus.

Transmission takes place by encrypting and authenticating them via the tool key. The runtime keys are never sent in plain text via the bus.

The FDSK is saved in the project and can be viewed in the project overview.

All keys for this project can also be exported (backup).

During project planning, it can be defined subsequently which functions/objects are to communicate securely. All objects with encrypted communication are identified by the "Secure" icon in the ETS.



5.2 Start-up without "KNX Data Secure"

Alternatively, the device can also be put into operation without KNX Data Secure. In this case, the device is unsecured and behaves like any other KNX device without KNX Data Secure function.

To start up the device without KNX Data Secure, select the device in the 'Topology' or 'Devices' section and set the 'Secure start-up' option in the 'Properties' area of the 'Settings' tab to 'Disabled'.

6 General information about DALI

The demands on modern lighting technology are very diverse. While in the past it was only a matter of providing light for visual tasks, today the focus is on features as comfort, ambience, functionality and energy saving. Also, a modern lighting system is increasingly included in the facility management of the

building installation to monitor the status of the entire lighting system. Often, complex lighting management is required to suit the premises and their use. Using traditional 1-10 V technology, all these requirements can only be met insufficiently or with a great deal of effort. In view of this, the DALI standard (DIN EN 62386 formerly DIN EN 60929) was developed in cooperation with leading EB manufacturers. It describes and defines the DALI digital interface (Digital Addressable Lighting Interface) for operating devices in lighting technology.

DALI has established itself as a company-neutral standard in lighting engineering. The range of ballasts, transformers, dimmers and relays with DALI interface shapes modern lighting technology.

6.1 DALI system description

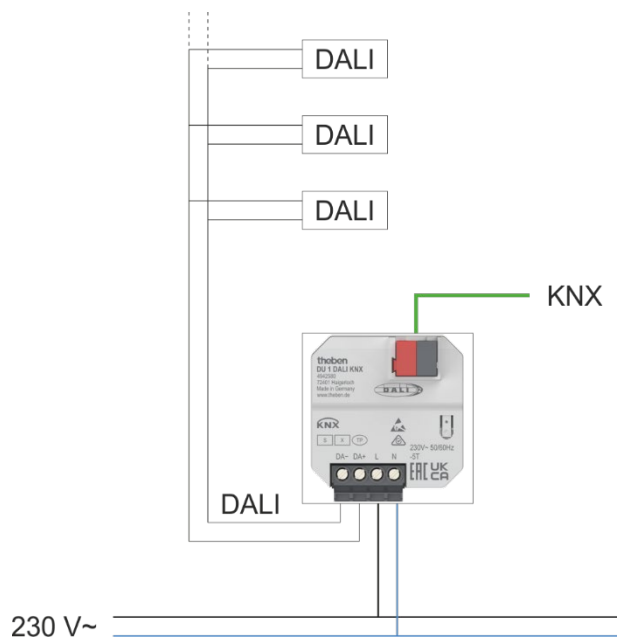
The DALI power supply is integrated in the DALI actuator, so no other power supply, e.g. DALI-PS, may be connected to the gateway.

As a DALI master, the DALI actuator sends broadcast telegrams.

Broadcast telegrams are telegrams to which all DALI participants listen together, so the participants are all controlled simultaneously.

In contrast to 1-10 V technology, the DALI ballast (EB) contains an electronic switching element. Therefore, no separate relay is required for switching the EBs, and there is no need for a switching capacity calculation. The electronic switching element allows for silent switching.

6.2 Schematic diagram



6.3 Response of DALI participants to EB operating voltage failure

The EB operating voltage failure, usually 230 V, at the DALI operating device, e.g. EB, results in the lamp going out and the ballast no longer functioning.

i The DU 1 DALI KNX recognises this condition as a mains error.

6.4 Response of DALI participants at restoration of EB operating voltage

In the delivery state, the operating devices with DALI interface usually behave in such a way that the lamps go to maximum brightness when the EB operating voltage is applied for the first time, or when the EB operating voltage is restored. This brightness value (power-on level) is specified by the EB manufacturer and represents a kind of safety function. During the start-up process, even without a programmed DALI master, the electrician can switch the DALI lighting on and off just with a normal automatic circuit breaker by connecting and disconnecting the 230 V operating voltage.

7 The DU 1 DALI KNX application programme

7.1 Selection in the product database

Manufacturer	Theben AG
Product family	DALI
Product type	Dimmers
Programme name	DU 1 DALI KNX

Number of communication objects	45
Number of group addresses	255
Number of associations	255



The ETS database can be found in the ETS online catalogue and on our website:
www.theben.de/downloads

7.2 Overview of communication objects

7.2.1 Dimmer, channel C1

No.	Object name	Function	Length	R	W	C	T	DPT
1	Channel C1	Switching ON/OFF	1 bit	-	W	C	-	1.001
2	Channel C1	Brighter/darker	4 bit	-	W	C	-	3.007
3	Channel C1	Dimming value	1 byte	-	W	C	-	5.001
4	Channel C1	Soft switching	1 bit	-	W	C	-	1.001
5	Channel C1	Block	1 bit	-	W	C	-	1.001
6	Channel C1	Call up/save scenes	1 byte	-	W	C	-	18.001
7	Channel C1	Enable scenes = 1	1 bit	-	W	C	-	1.001
		Block scenes = 1	1 bit	-	W	C	-	1.001
8	Channel C1	Force	2 bit	-	W	C	-	2.001
		Dimming value with force	1 byte	-	W	C	-	5.001
		Force = 1	1 bit	-	W	C	-	1.001
		Force = 0	1 bit	-	W	C	-	1.001
9	Channel C1	Dimming value limitation	1 byte	-	W	C	-	5.001
10	Channel C1	Feedback On/Off	1 bit	R	-	C	T	1.001
11	Channel C1	Feedback in %	1 byte	R	-	C	T	5.001
12	Channel C1	Operating hours feedback	4 bytes	R	-	C	T	13.100
		Time to next service	4 bytes	R	-	C	T	13.100
13	Channel C1	Service required	1 bit	R	-	C	T	1.001
14	Channel C1	Reset service	1 bit	-	W	C	-	1.001
		Reset operating hours	1 bit	-	W	C	-	1.001
15	Channel C1	General error message	1 bit	R	-	C	T	1.001
16	Channel C1	Fault DALI/mains	1 bit	R	-	C	T	1.001
17	Channel C1	Lamp failure	1 bit	R	-	C	T	1.001
19	Channel C1	Colour control RGB	3 bytes	-	W	C	-	232.600
		Colour temperature	2 bytes	-	W	C	-	7.600
		Colour control RGBW	6 bytes	-	W	C	-	251.600
20	Channel C1	Colour control (RGB red)	1 byte	-	W	C	-	5.001
		Colour control (colour hue)	1 byte	-	W	C	-	5.003
		Relative colour temperature	1 byte	-	W	C	-	5.001
21	Channel C1	Colour control (RGB green)	1 byte	-	W	C	-	5.001
		Colour control (saturation)	1 byte	-	W	C	-	5.001
22	Channel C1	Colour control (RGB blue)	1 byte	-	W	C	-	5.001
23	Channel C1	Colour control white	1 byte	-	W	C	-	5.001
24	Channel C1	Colour change (RGB red)	4 bit	-	W	C	-	3.007
		Colour change (colour hue)	4 bit	-	W	C	-	3.007
		Colour temperature change	4 bit	-	W	C	-	3.007
25	Channel C1	Colour change (RGB green)	4 bit	-	W	C	-	3.007
		Colour change (saturation)	4 bit	-	W	C	-	3.007
26	Channel C1	Colour change (RGB blue)	4 bit	-	W	C	-	3.007
27	Channel C1	Colour change white	4 bit	-	W	C	-	3.007
28	Channel C1	Colour status RGB	3 bytes	R	-	C	T	232.600
		Colour status RGBW	6 bytes	R	-	C	T	251.600
		Colour temperature status	2 bytes	R	-	C	T	7.600
29	Channel C1	Colour status (RGB red)	1 byte	R	-	C	T	5.001
		Colour status (colour hue)	1 byte	R	-	C	T	5.003
30	Channel C1	Colour status (RGB green)	1 byte	R	-	C	T	5.001

No.	Object name	Function	Length	R	W	C	T	DPT
		<i>Colour status (saturation)</i>	<i>1 byte</i>	<i>R</i>	<i>-</i>	<i>C</i>	<i>T</i>	<i>5.001</i>
31	<i>Channel C1</i>	<i>Colour status (RGB blue)</i>	<i>1 byte</i>	<i>R</i>	<i>-</i>	<i>C</i>	<i>T</i>	<i>5.001</i>
32	<i>Channel C1</i>	<i>Colour status white</i>	<i>1 byte</i>	<i>R</i>	<i>-</i>	<i>C</i>	<i>T</i>	<i>5.001</i>
33	<i>Channel C1</i>	<i>Switching ON/OFF (RGB red)</i>	<i>1 bit</i>	<i>-</i>	<i>W</i>	<i>C</i>	<i>-</i>	<i>1.001</i>
34	<i>Channel C1</i>	<i>Switching ON/OFF (RGB green)</i>	<i>1 bit</i>	<i>-</i>	<i>W</i>	<i>C</i>	<i>-</i>	<i>1.001</i>
35	<i>Channel C1</i>	<i>Switching ON/OFF (RGB blue)</i>	<i>1 bit</i>	<i>-</i>	<i>W</i>	<i>C</i>	<i>-</i>	<i>1.001</i>
36	<i>Channel C1</i>	<i>Switching ON/OFF white</i>	<i>1 bit</i>	<i>-</i>	<i>W</i>	<i>C</i>	<i>-</i>	<i>1.001</i>

7.2.2 External inputs: Switch/push button function

No.	Object name	Function	Length	R	W	C	T	DPT
41	Channel I1.1	Switching	1 bit	R	W	C	T	1.001
		Priority	2 bit	R	-	C	T	2.001
		Send percentage value	1 byte	R	-	C	T	5.001
		Send value	1 byte	R	-	C	T	5.010
42	Channel I1.2	Switching	1 bit	R	W	C	T	1.001
		Priority	2 bit	R	-	C	T	2.001
		Send percentage value	1 byte	R	-	C	T	5.001
		Send value	1 byte	R	-	C	T	5.010
45	Channel I1	Block = 1	1 bit	-	W	C	-	1.001
		Block = 0	1 bit	-	W	C	-	1.003
51-55	Channel I2 (details: see channel I1)							

7.2.3 External inputs: Dimming function

No.	Object name	Function	Length	R	W	C	T	DPT
41	Channel I1	Switching	1 bit	R	W	C	T	1.001
42	Channel I1	Brighter/darker	4 bit	R	-	C	T	3.007
		Brighter	4 bit	R	-	C	T	3.007
		Darker	4 bit	R	-	C	T	3.007
43	Channel I1.1	Switching	1 bit	R	W	C	T	1.001
		Priority	2 bit	R	-	C	T	2.001
		Send percentage value	1 byte	R	-	C	T	5.001
		Send value	1 byte	R	-	C	T	5.010
45	Channel I1	Block = 1	1 bit	-	W	C	-	1.001
		Block = 0	1 bit	-	W	C	-	1.003
51-55	Channel I2 (details: see channel I1)							

7.2.4 External inputs: Blinds function

No.	Object name	Function	Length	R	W	C	T	DPT
41	Channel I1	Step/stop	1 bit	R	-	C	T	1.010
42	Channel I1	UP/DOWN	1 bit	R	W	C	T	1.008
		UP	1 bit	R	-	C	T	1.008
		DOWN	1 bit	R	-	C	T	1.008
43	Channel I1.1	Switching	1 bit	R	W	C	T	1.001
		Priority	2 bit	R	-	C	T	2.001
		Send percentage value	1 byte	R	-	C	T	5.001
		Height % ⁵	1 byte	R	-	C	T	5.001
		Send value	1 byte	R	-	C	T	5.010
		2 byte 9.x	2 bytes	R	-	C	T	9.xxx
		4 byte 14.x	4 bytes	R	-	C	T	14.xxx
44	Channel I1.2	Slat % ⁶	1 byte	R	-	C	T	5.001
45	Channel I1	Block = 1	1 bit	-	W	C	-	1.001
		Block = 0	1 bit	-	W	C	-	1.003
51-55	Channel I2 (details: see channel I1)							

7.2.5 External inputs: Temperature input function (I2 only)

No.	Object name	Function	Length	R	W	C	T	DPT
51	Channel I2	Actual value for temperature	2 bytes	R	-	C	T	9.001

7.2.6 Common objects

No.	Object name	Function	Length	R	W	C	T	DPT
71	Central	Central permanent ON	1 bit	-	W	C	-	1.001
72	Central	Central permanent OFF	1 bit	-	W	C	-	1.001
73	Central	Central Switching ON/OFF	1 bit	-	W	C	-	1.001
74	Central	Call up/save central scenes	1 byte	-	W	C	-	18.001

⁵ Upon double-click with object type = Height % + slat %

⁶ Upon double-click with object type = Height % + slat %

7.3 Description of communication objects

7.3.1 Objects for DALI actuator

Object 1: Switching ON/OFF

1 = switch on load.

0 = switch off load.

See also: parameter Switch on value.

Object 2: Brighter/darker

This object is actuated with 4-bit telegrams (DPT 3.007 Control_Dimming).

This function can be used to incrementally dim the light up or down.

In the standard application, telegrams are sent with 64 increments.

IMPORTANT: The response to 4-bit telegrams depends on the parameter Switching On and Off with a 4-bit telegram.

See appendix: [4-bit telegrams \(brighter/darker\)](#)

Object 3: Dimming value

This object can be used to select the desired dimming value directly.

Format: 1 byte percentage value.

0 = 0%

255 = 100%

Object 4: Soft switching

A 1 on this object starts a soft switching cycle, i.e.: The brightness is gradually increased, starting from the minimum brightness.

Afterwards, the dimming value remains constant for the configured time. After this time has elapsed, the light is gradually dimmed down to the configured value after Soft OFF.

The configured minimum and maximum dimming value is taken into account.

The cycle can be extended or prematurely terminated via telegrams.

This sequence can also be controlled using a time switch if the *Time between soft ON and soft OFF* parameter is set to *Until soft OFF telegram*.

The dimming cycle is then started with a 1 and finished with a 0.

See appendix: [Using the soft switch function](#)

Object 5: Block

Response to the block being set and cancelled can be configured if the block function has been activated (**Configuration options** parameter page).

The block only applies when the object is received, i.e. with 0 the channel is not blocked after restoration of the bus supply.

If the parameter Behaviour when setting the block = no reaction, a running soft-switch process will not be interrupted.

Object 6: Call up/save scenes

Only available if the scene function has been activated (**Configuration options** parameter page).

This object can be used to save and subsequently call up scenes.

Saving stores the dimming value and, if selected, also the colour value of the channel.

It does not matter how this dimming value is produced (whether via switch commands or central objects).

When calling up, the saved dimming and colour value will be restored.

All scene numbers from 1 to 63 are supported.

The channel can participate in up to 8 scenes.

See appendix: [Scenes](#)

Object 7: Enable scenes = 1, block scenes = 1

Blocks the scene function with a 1 or a 0 depending on the configuration.

As long as it is blocked, scenes cannot be saved or called up.

Object 8: Force, dimming value during force, force = 1, force = 0

The function of the force object can be configured as a 1-bit, 2-bit or 1-byte object.

Format of force object	Force		Response with force	
	trigger with	end with	Begin	End
1 bit	1 or 0 (configurable)	0 or 1 (configurable)	configurable in the application programme	
2 bit	Force On = 3 Force Off = 2	Deactivate force = 0 or 1	configurable in the application programme.	Configurable
1 byte	1-100%	0	The triggering telegram acts simultaneously as a force dimming value	Configurable

A colour value is also sent, see parameter *Colour value or: Colour temperature at permanent RGB* on the parameter page **Colour value**.

Object 9: Dimming value limitation

The dimming value can be temporarily restricted via object Dimming value limitation. This is used, for example, to ensure that basic lighting is not exceeded at night, while during the evening the full range of lighting can be used.

If the object value = 0, the dimming value is not restricted.

If the object value is greater than 0, then this value indicates the limit for the dimming value.

If the object value is smaller than the configured minimum dimming value, then the brightness is restricted to this minimum dimming value.

If the restriction is removed, the dimming value continues to remain restricted until a new dimming command is received.

During the restriction, the Soft ON and Soft OFF times are adjusted in such a way that the speed of the brightness change remains the same as when there are no restrictions.

Object 10: Feedback On/Off

Sends the current dimming status:

1 = current dimming value is between 1% and 100%

0 = current dimming value is 0%

Object 11: Feedback in %

Sends the new dimming value after a change as soon as a dimming process is completed, i.e. once the new set point value has been reached.

Format: 1 byte, 0 ... 255 i.e. 0 ... 100%

Object 12: Operating hours feedback, time to next service

Only available if the operating hours counter function has been activated (**Configuration options** parameter page).

Reports, depending on selected type of hour counter (**Hour counter and Service** parameter page), either the remaining time to the next set service or the current status of the hour counter.

Object 13: Service required

Only available if the hour counter function has been activated (**Configuration options** parameter page) and Type of hour counter = Counter for time to next service.

Reports if the next service is due.

0 = not due

1 = service interval has expired

Object 14: Reset service, reset operating hours

Only available if the hour counter function is activated.
(**Configuration options** parameter page).

Object 15: General error message

Used as a malfunction signal:

0 = no error

1 = an error has been detected

A general error occurs when one of the other errors has been detected.

This message can, for example, be shown on a display.

Object 16: Fault DALI/mains

Fault DALI bus has been detected.

(overload or short circuit)

In case of overload, the measured current on the DALI bus is too high.

In case of a short circuit, the measured voltage on the DALI bus is too low.

Object 17: Lamp failure

Reports a lamp malfunction.

Colour temperature function

Object 19: Absolute colour temperature (2 byte)

DPT 7.600. Sends colour temperature telegrams from 1000 to 10000 K.

Object 20: Relative colour temperature (1 byte)

DPT 5.001. The colour temperature can be set via this object. The object is a % value and sets the colour temperature as a percentage between minimum and maximum colour temperature.

Object 24: Colour change

DPT 3.007. The colour temperature can be changed via this object. Independent of the bits 0..2 in the 4-bit dimming telegram, the complete range of 0..100% is always run through.

Object 28: Colour temperature status

DPT 7.600. The colour temperature is reported via this object.

RGB/RGBW function



With these colour values, the colour components can either be sent together in one object or separately to several objects.

In HSV or HSVW format, the output is exclusively via separate objects.

Objects 19-36: Colour control

Function	Type	No.	Object function
RGB colour control (approaching a fixed value)	RGB 3 bytes	19	Colour control RGB
	RGB separate objects	20	RGB red
		21	RGB green
		22	RGB blue
	HSV separate objects	20	HSV colour hue
		21	HSV saturation
RGB colour change (moving by a certain value)	RGB separate objects	24	RGB red
		25	RGB green
		26	RGB blue
	HSV separate objects	24	HSV colour hue
		25	HSV saturation
RGB colour status (send value on bus)	RGB 3 bytes	28	Colour status RGB
	RGB separate objects	29	RGB red
		30	RGB green
		31	RGB blue
	HSV separate objects	29	HSV colour hue
RGB Switching ON/OFF (switching colour)	RGB separate objects	33	RGB red
		34	RGB green
		35	RGB blue
RGBW colour control (approaching a fixed value)	RGBW 6 bytes	19	Colour control RGBW
	RGBW separate objects	20	RGB(W) red
		21	RGB(W) green
		22	RGB(W) blue

Function	Type	No.	Object function
	<i>HSVW separate objects</i>	23	<i>White level</i>
		20	<i>HSV(W) colour hue</i>
		21	<i>HSV(W) saturation</i>
		23	<i>White level</i>
<i>RGBW colour change (moving by a certain value)</i>	<i>RGBW separate objects</i>	24	<i>RGB(W) red</i>
		25	<i>RGB(W) green</i>
		26	<i>RGB(W) blue</i>
		27	<i>White level</i>
	<i>HSVW separate objects</i>	24	<i>HSV(W) colour hue</i>
		25	<i>HSV(W) saturation</i>
		27	<i>White level</i>
<i>RGBW colour status (send value on bus)</i>	<i>RGBW 3 bytes</i>	28	<i>Colour status RGBW</i>
	<i>RGB separate objects</i>	29	<i>RGB(W) red</i>
		30	<i>RGB(W) green</i>
		31	<i>RGB(W) blue</i>
		32	<i>White level</i>
	<i>HSV separate objects</i>	29	<i>HSV(W) colour hue</i>
		30	<i>HSV(W) saturation</i>
		32	<i>White level</i>
<i>RGBW Switching ON/OFF (switching colour)</i>	<i>RGB separate objects</i>	33	<i>RGB(W) red</i>
		34	<i>RGB(W) green</i>
		35	<i>RGB(W) blue</i>
		36	<i>RGB(W) white</i>

7.3.2 Objects for the external inputs: Switch function

Object 41: Channel I1.1

First output object of the channel (first telegram).

4 telegram formats can be set:

Switching ON/OFF, priority, send percentage value, send value.

Object 42: Channel I1.2

Second output object of the channel (second telegram).

4 telegram formats can be set:

Switching ON/OFF, priority, send percentage value, send value.

Object 45: Channel I1 block = 1, or block = 0

The channel is blocked via this object.

The acting direction of the block object and behaviour when the block is set or cancelled can be configured.

Objects 51-55

Objects for channel I2

7.3.3 Objects for the external inputs: Push button function

Object 41: Channel I1.1

First output object of the channel (first telegram).

4 telegram formats can be set:

Switching ON/OFF, priority, send percentage value, send value.

Object 42: Channel I1.2

Second output object of the channel (second telegram).

4 telegram formats can be set:

Switching ON/OFF, priority, send percentage value, send value.

Object 45: Channel I1 block = 1, or block = 0

The channel is blocked via this object.

The acting direction of the block object and behaviour when the block is set or cancelled can be configured.

Objects 51-55

Objects for channel I2

7.3.4 Objects for the external inputs: Dimming function

Object 41: Channel I1.1 switching

Switches the dimmer on and off.

Object 42: Channel I1.1 brighter, darker, brighter/darker

4-bit dimming commands.

Object 43: Channel I1.1 switching, priority, percentage.

Output object for the additional function on double-click.

4 telegram formats can be set:

Switching ON/OFF, priority, send percentage value, send value.

Object 45: Channel I1 block = 1, or block = 0

The channel is blocked via this object.

The acting direction of the block object and behaviour when the block is set or cancelled can be configured.

Objects 51-55

Objects for channel I2

7.3.5 Objects for the external inputs: Blinds function

Object 41: Channel I1 step/stop

Sends step/stop commands to the blind actuator.

Object 42: Channel I1 UP/DOWN, UP, DOWN

Sends operating commands to the blind actuator.

Object 43: Channel I1.1 switching, priority, percentage, height %

Output object for the additional function on double-click.

5 telegram formats can be set:

Switching ON/OFF, priority, send percentage value, send value, height %.

Object 44: Channel I1.1 slat %

Slat telegram for positioning the blinds upon double-click (together with object height %, with *object type = height + slat*).

Object 45: Channel I1 block = 1, or block = 0

The channel is blocked via this object.

The acting direction of the block object and behaviour when the block is set or cancelled can be configured.

Objects 51-55

Objects for channel I2

7.3.6 Objects for the external inputs: Temperature input function

Object 51: Channel I2 actual value for temperature⁷

Sends the temperature measured at input I2 (remote sensor or floor temperature sensor).

⁷ The temperature input function is only possible with input I2.

7.3.7 Common objects

Object 71: Central permanent ON

Central switch-on function.

0 = permanent ON reset

1 = permanent ON

Participation in this object can be set (**Configuration options** parameter page).

 This object takes top priority. As long as it is set, other switch commands will not work on the participating channel.

Object 72: Central permanent OFF

Central switch-off function.

0 = permanent OFF reset

1 = permanent OFF

Participation in this object can be set (**Configuration options** parameter page).

 This object has the second highest priority after Central permanent ON. As long as it is set, other switch commands will not work on the participating channel.

Object 73: Central switching

Central switch function.

0 = OFF

1 = ON

Participation in this object can be set (**Configuration options** parameter page).

With this object, the participating channel responds exactly as if its input object were receiving a switch command.

Object 74: Call up/save central scenes

Central object for using scenes.

This object can be used to save and subsequently call up scenes.

See appendix: [Scenes](#)

7.4 Parameter pages overview

7.4.1 General

Parameter page	Description
General	Activate binary inputs.

7.4.2 DALI actuator

Parameter page	Description
Channel	
Configuration options	Characteristics of channel and activation of additional functions (colour control, soft switching, force, etc.).
Colour control	Kind and object type of colour control, as well as other functions (colour value at permanent, response when switching on, etc.).
Dimming response	Dimming times, dimming switch-on value, etc.
Dimming value limitations	Scope of the limitation.
Soft switching	Brightness/dimming value, colour values and time settings for soft switching.
Block function	Type of block telegram and response to blocking.
Feedback	Format of the feedback objects and cyclical transmission time.
Force	Response in forced operation.
Scenes	Selection of scene numbers relevant to the channel.
Hour counter and service	Type of hour counter and, if applicable, service interval, etc.
Diagnostic messages	Activate transmission of the diagnostic and error messages.
Power failure and restoration	Response in the event of download and bus failure, restoration of the mains and bus supply.

7.4.3 External inputs

Parameter page	Description
Input I1, I2	
Configuration options	Function of the input, debounce time, number of telegrams, block function, etc. Additionally in the case of I2: Selection of the temperature sensor, temperature calibration, etc.
Switch object 1, 2	Object type, transmission behaviour, etc. can be set for each object individually.
Dimming directly	during direct control: response to short or long button push
Push button object 1, 2	Object type, transmission behaviour, etc. can be set for each object individually.
Dimming	Type of control.
Blinds	Type of control.
Double-click	Additional telegrams for dimming and blinds.

7.5 General parameters

7.5.1 General

Designation	Values	Description
<i>Use binary inputs</i>	<i>No</i>	No binary inputs
	<i>yes</i>	The binary inputs I1 and I2 are activated

7.6 Parameters for the DALI actuator

7.6.1 Channel: Configuration options

Designation	Values	Description
Activate colour control	<i>no</i> <i>yes</i>	<i>No colour control.</i> The page Colour control will be shown.
Adjust dimming value limitations	<i>no</i>	The standard values apply: <i>Perform limitation when writing to object</i> = <i>no</i> , <i>Limitation applies to:</i> - <i>soft switching,</i> - <i>absolute dimming,</i> - <i>relative dimming,</i> - <i>switch command</i> = <i>no</i>
	<i>yes</i>	The page Dimming value limitations will be shown and all parameters can be adjusted individually.
Adjust soft switching	<i>no</i>	The standard values apply: - <i>Time for Soft ON = 1 min</i> - <i>Dimming value after Soft ON</i> = <i>100%</i> - <i>Time between Soft ON and Soft OFF = 5 min</i> - <i>Dimming value after Soft OFF</i> = <i>0%</i> - <i>Time for Soft OFF = 1 min</i>
	<i>yes</i>	The page Soft switching will be shown and all parameters can be adjusted individually.
Adjust block function	<i>no</i>	The standard values apply: - <i>Block with 1 (standard)</i> - <i>Response when the block is set</i> = <i>10%</i> - <i>Response when cancelling the block = update</i>
	<i>yes</i>	The page Block function will be shown and all parameters can be adjusted individually.
Participation in central objects	<i>no</i>	Central objects are not taken into account.

7.6.2 Colour control

This parameter can be used to set the colour control to be used on the respective channel.

Note: Make sure that the EBs connected to this channel support this type of control.

Designation	Values	Description
Type of colour control	Colour temperature 1000 – 10000 K	Colour temperature
	RGB colour	The colour can be selected directly via the Color Picker. The colour value is additionally displayed as a 3 byte hexadecimal value.
	RGBW colour	The colour can be selected directly via the Color Picker. The colour value is additionally displayed as a 3 byte hexadecimal value.
Object type	With RGB colour	
	RGB(W) combined	1 RGB object 3 byte DPT232.600
	RGB(W) separate objects	3 objects: red, green, blue.
	HSV(W) separate objects	2 objects: Colour value (hue), colour saturation (saturation).
	With RGBW colour	
	RGBW combined	1 RGBW object 6 byte DPT251.600
	RGBW separate objects	4 objects: red, green, blue, white level (white).
	HSVW separate objects	3 objects: Colour value (hue), colour saturation (saturation), white level (white).
Colour at permanent	With RGB(W) colour	
	Colour value at Permanent RGB(W) #000000 – #FFFFFF	During Permanent ON and Force, the configured colour is set when colour control is activated
	Additional white level Permanent (RGBW) #00 ... #FF	
	At colour temperature	
	Colour temperature at Force/Permanent On 1000 – 10000 K 3000 K	This parameter can be used to set the colour temperature to be used for Force and Permanent On.
Response when switching on	Last object value	The last object value is used. Note: If the object value is invalid, the preset colour of the ETS is used.
	ETS parameter	Use ETS parameters as set below
Colour when	At colour temperature	

Designation	Values	Description
switching on	Colour temperature 1000 – 10000 K 3000 K	This parameter can be used to set the colour temperature to be used when switching on.
	With RGB(W)	
	Colour value when switching on RGB(W) #000000 – #FFFFFF Additional white level when switching on (RGBW) #00 ... #FF	This parameter can be used to set the colour to be used when switching on.
Minimum colour temperature	1000 K..10000 K 2000 K	Parameter for setting the minimum valid value for the colour temperature. The minimum colour temperature is required for the calculation of the relative colour temperature.
Maximum colour temperature	1000 K..10000 K 6000 K	Parameter for setting the maximum valid value for the colour temperature. The maximum colour temperature is required for the calculation of the relative colour temperature. Both parameters are used for calculation and determine the settable values.
Time during colour change via dimming	1 s, 2 s, 4 s 6 s, 8 s, 12 s , 15 s, 24 s, 30 s, 60 s, 90 s	This parameter is used to decide how quickly the colour value should be changed when dimming.
Time during colour change	immediately 1 s, 2 s, 4 s 6 s, 8 s, 12 s, 15 s, 24 s, 30 s, 60 s, 90 s	This parameter is used to decide how quickly the colour value should be changed.

Designation	Values	Description
	<i>soft on with dimming time 1</i> <i>soft on with dimming time 2</i> <i>soft on with dimming time 3</i>	The change to the new dimming value takes place within the preset dimming time, proportionately to the change in value. Example with dimming time 1 = 12 s: Change from: - 0 to 100% or 100 to 0% in 12 s (= 100% of 12 s) - 25 to 50% or 50 to 25% in 3 s (= 25% of 12 s) etc.
Switch-on value	<i>Value before previous switch-off</i> <i>minimum value</i> 10%, 20%, 30% 40%, 50%, 60% 70%, 80%, 90%, 100%	The last dimming value before switching off is saved and restored. The configured minimum value is applied. The dimmer adopts the selected value after it is switched on. Here again the configured <i>minimum dimming value</i> will be taken into account.
Switch-on with 4-bit dim telegr.	 <i>no</i> <i>yes</i>	Defines the response if the channel is switched off and a 4-bit telegram (brighter) is received. See appendix: <u>4-bit telegrams</u> (brighter / darker). Channel status remains unchanged. Channel is switched on and dimmed.
Switching off with a 4-bit dim telegr.	 <i>no</i> <i>yes</i>	Defines the response if the channel is switched on and a 4-bit telegram (darker) is received. See appendix: <u>4-bit telegrams</u> (brighter / darker). Channel status remains unchanged. Channel is switched off.

7.6.4 Dimming value limitations

i The dimming value can be temporarily restricted via object *Dimming value limitation*. This is used, for example, to ensure that basic lighting is not exceeded at night, while during the evening the full range of lighting can be used.

Object description, see Object 9: Dimming value limitation.

Designation	Values	Description
<i>Perform limitation when writing to object</i>	no <i>yes</i>	Limitation will not take effect until the next dimming process. Limit the dimming value as soon as a value is received on the <i>Dimming value limitation</i> object.
<i>Limitation applies to switch command (1-bit)</i>	no <i>yes</i>	No limitation during switch commands. Limitation is effective.
<i>Limitation applies to relative dimming (4-bit)</i>	no <i>yes</i>	No limitation during brighter / darker commands. Limitation is effective.
<i>Limitation applies to absolute dimming (8-bit)</i>	no <i>yes</i>	No limitation for percentage value telegrams. Limitation is effective.
<i>Limitation applies to soft switching</i>	no <i>yes</i>	No limitation for soft switching. Limitation is effective.

7.6.5 Soft switching

Designation	Values	Description
Time for Soft ON	0 s, 1 s, 2 s, 4 s 6 s, 8 s, 12 s, 15 s 24 s, 30 s, 45 s, 1 min 2 min, 3 min, 4 min, 5 min 6 min, 7 min, 8 min, 9 min 10 min, 12 min, 15 min., 20 min 30 min, 40 min, 50 min, 60 min	Duration of dim up phase (t1) for soft switching (see appendix). 0 s = switch on immediately.  For further details, see appendix : <u>Retriggering and premature switch off.</u>
Dimming value after Soft ON	10%, 20%, 30% 40%, 50%, 60%, 70%, 80%, 90%, 100%	Final value at the end of Soft ON phase (Val) Comment: Here again the configured <i>minimum dimming value</i> will be taken into account.
Response colour value with Soft ON	Keep last object value Use ETS parameter Colour value at Soft ON	Note: At "Keep last object value" - if the object value is invalid, the preset colour of the ETS will be used.
Colour value at Soft ON (only visible if behaviour Colour value at Soft ON is set to Use ETS parameter)	Colour temperature at Soft ON 1000 K..10000 K [3000 K] RGB(W)/HSV(W) #000000 ... #FFFFFF White level #00 ... #FF	This parameter can be used to set the colour temperature to be used for Soft ON. Setting in increments of 10. This parameter can be used to set the colour value to be used for Soft ON.
Time between Soft ON and Soft OFF	until Soft OFF telegram 1 s, 2 s, 3 s, 4 s 5 s, 6 s, 7 s, 8 s, 9 s 10 s, 15 s, 20 s, 30 s 40 s, 50 s, 1 min, 2 min 3 min, 4 min, 5 min , 6 min 7 min, 8 min, 9 min, 10 min 12 min, 15 min, 20 min, 30 min, 40 min, 50 min, 60 min	No time restriction; Soft OFF phase is initiated by a telegram. Delay (t2) until the start of the Soft OFF phase.
Time for Soft OFF	0 s, 1 s, 2 s, 4 s 6 s, 8 s, 12 s, 15 s 24 s, 30 s, 45 s, 1 min 2 min, 3 min, 4 min, 5 min 6 min, 7 min, 8 min, 9 min 10 min, 12 min, 15 min, 20 min, 30 min, 40 min, 50 min, 60 min	Duration of the Soft OFF phase (t3). 0 s = switch off immediately  For further details, see appendix : <u>Retriggering and premature switch off.</u>
Dimming value after Soft OFF	0% , 10%, 20%, 30% 40%, 50%, 60%, 70%, 80%, 90%, 100%	Final value at the end of the Soft OFF phase (Val) Comment: Here again the configured <i>minimum and maximum dimming value</i> will be taken into account.

Designation	Values	Description
Response colour value with Soft OFF	last object value <i>ETS parameter</i>	Note: At "Keep last object value" - if the object value is invalid, the preset colour of the ETS will be used.
Colour value at Soft OFF (only visible if behaviour Colour value at Soft OFF is set to Use ETS parameter)	Colour temperature at Soft OFF 1000 K..10000 K [3000 K] <i>RGB(W)/HSV(W)</i> #000000 ... #FFFFFF White level #00 ... #FF	This parameter can be used to set the colour temperature to be used for Soft OFF. Setting in increments of 10. This parameter can be used to set which colour value is to be used for Soft OFF.

7.6.6 Block function

Designation	Values	Description
Block telegram	Block with 1 (standard) <i>Block with 0</i>	0 = cancel block 1 = block 0 = block 1 = cancel block  The block is always deactivated after reset.
Response when setting the block	<i>no change</i> 100% 0%, 10% , 20%, 30% 40%, 50%, 60%, 70%, 80%, 90%	No response. Dim to the set value.
Response when the block is cancelled	<i>no change</i> Update 100%, 0%, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%	No response. If a telegram was received during the block: Apply state. Otherwise: Restore state before the block. Dim to the set value.

7.6.7 Feedback

Designation	Values	Description
<i>Format of 1-bit feedback</i>	<i>not inverted</i> <i>inverted</i>	Standard setting: 1-100% = 1 0% = 0 1-100% = 0 0% = 1
<i>Send 1-bit feedback cyclically</i>	<i>no</i> <i>yes</i>	Send at regular intervals?
<i>Send 8-bit feedback</i>	<i>only after ending the dimming process</i> <i>every 10%</i> <i>every 20%</i> <i>every 30%</i>	Only send current dimming value when the new dimming value has been reached. Send even during the dimming process.
<i>Send 8-bit feedback cyclically</i>	<i>no</i> <i>yes</i>	Send at regular intervals?
<i>Time for cyclical transmission of feedback (if available)</i>	<i>2 min, 3 min, 5 min, 10 min, 15 min, 20 min, 30 min, 45 min, 60 min</i>	At what interval? This setting applies for both feedback objects (1 and 8-bit).

7.6.8 Force

Designation	Values	Description
<i>Format of force object</i>	1 bit <i>2 bit</i> <i>1 byte (%)</i>	Force is triggered by: Switch telegram. Priority telegram. Dimming value.
1 bit		
<i>Activate force function with</i>	1 <i>0</i>	Recommended. The polarity of the object is inverted. ⁸
<i>Behaviour at start of force</i>	no change <i>minimum dimming value</i> <i>100%</i> <i>OFF</i> <i>10%, 20%, 30%</i> <i>40%, 50%, 60%</i> <i>70%, 80%, 90%</i>	Response to the receipt of a force telegram. Here again the configured <i>minimum dimming value</i> will be taken into account.
<i>Behaviour at end of force</i>	<i>update</i> ⁹ Value before force <i>minimum dimming value</i> <i>100%</i> <i>OFF</i> <i>10%, 20%, 30%</i> <i>40%, 50%, 60%</i> <i>70%, 80%, 90%</i>	Response to cancellation of force. Here again the configured <i>minimum dimming value</i> will be taken into account.
2 bit		
<i>Behaviour at force ON</i>	<i>no change</i> <i>minimum dimming value</i> 100% <i>OFF</i> <i>10%, 20%, 30%</i> <i>40%, 50%, 60%</i> <i>70%, 80%, 90%</i>	Response to the receipt of a force telegram. Here again the configured <i>minimum dimming value</i> will be taken into account.
<i>Behaviour at force OFF</i>	OFF	-
<i>Behaviour at end of force</i>	<i>update</i> ¹⁰ Value before force	Response to cancellation of force. Here again the configured <i>minimum dimming value</i> will be taken into account.

⁸ After reset/download, forced operation is **not** activated.

⁹ 4-bit commands received during the force (brighter/darker) will not be considered. Soft ON and Soft OFF processes will be aborted.

¹⁰ 4-bit commands received during the force (brighter/darker) will not be considered. Soft ON and Soft OFF processes will be aborted.

Designation	Values	Description
	<i>minimum dimming value</i> <i>100%</i> <i>OFF</i> <i>10%, 20%, 30%</i> <i>40%, 50%, 60%</i> <i>70%, 80%, 90%</i>	
1 byte (%)		
<i>Behaviour at end of force</i>	<i>update¹¹</i> <i>Value before force</i> <i>minimum dimming value</i> <i>100%</i> <i>OFF</i> <i>10%, 20%, 30%</i> <i>40%, 50%, 60%</i> <i>70%, 80%, 90%</i>	Response to cancellation of force. Here again the configured <i>minimum dimming value</i> will be taken into account.

¹¹ 4-bit commands received during the force (brighter/darker) will not be considered.
Soft ON and Soft OFF processes will be aborted.

7.6.9 Scenes

One dimming channel can participate in up to 8 scenes.

Designation	Values	Description
<i>Block telegram for scenes</i>	Block with 1 (standard) <i>Block with 0</i>	0 = cancel block 1 = block 0 = block 1 = cancel block Note: With this setting, the scenes are always blocked immediately after reset or download.
<i>All channel scene statuses</i>	Overwrite on download <i>Unchanged after download</i>	A download deletes all scene memories of a channel, i.e. all previously taught-in scenes. When a scene number is called up, the channel assumes the configured assigned dimming value (see below). See in the appendix: <u>Entering scenes without telegrams</u> All previously taught-in scenes are saved. However, the scene numbers to which the channel should react can be changed (see below: Channel reacts to).
<i>Participation in central scene object</i>	No yes	Should the device react to the central scene object?
<i>Channel reacts to</i>	<i>No scene number</i> Scene number 1 ... <i>Scene number 63</i>	First of the 8 possible scene numbers to which the channel is to react.
<i>Assigned dimming value</i>	<i>Off</i> 10%, 20%, 30% 40%, 50%, 60%, 70%, 80%, 90%, 100%	New dimming value to be assigned to the selected scene number. Only possible if the scene statuses are to be overwritten after download.
<i>Behaviour when receiving the scene number</i>	<i>0 = immediate on</i> 1 = soft on at dimming speed 1 <i>2 = soft on at dimming speed 2</i> <i>3 = soft on at dimming speed 3</i>	The behaviour is identical to receiving an absolute dimming value.
<i>Permit teach-in</i>	No	Scenes can only be called up.

Designation	Values	Description
	Yes	The user can both call up and teach in or amend scenes.
<i>Colour value</i>	RGB RGBW Colour temperature	When colour control is activated, a colour value can be assigned to the selected scene number. The parameter Type of colour control defines which values are available.

7.6.10 Hour counter and service

Designation	Values	Description
Type of hour counter	Hour counter <i>Counter for time to next service</i>	Forward counter for channel duty cycle. Backward counter for channel duty cycle.
Hour counter		
Reporting of operating hours in the event of a change (0..100 h, 0 = no report)	0..100 Default value = 10	At what interval is the current counter reading to be sent? Example: 10 = Send each time the counter reading increases by another 10 hours.
Report operating hours cyclically	No yes	Send at regular intervals?
Time for cyclical transmission	2 minutes, 3 minutes, 5 minutes, 10 minutes, 15 minutes, 20 minutes, 30 minutes, 45 minutes 60 minutes	At what interval?
Counter for time to next service		
Service interval (x10 h)	0..2000 Default value = 100	Desired time between 2 services. Example: 10 = 10 x 10 h = 100 hours
Reporting of time to service in the event of a change (0 = do not report)	0..100 Default value = 10	At what interval is the current counter reading to be sent? Example: 10 = Send each time the counter reading decreases by another 10 hours.
Report time to service cyclically	no Yes	Send remaining time to next service at regular intervals? → Object Time to next service.
Report service cyclically	no Yes	Send expiry of time to next service at regular intervals? → Object Service required".
Time for cyclical transmission (if used)	2 minutes, 3 minutes, 5 minutes, 10 minutes, 15 minutes, 20 minutes, 30 minutes, 45 minutes 60 minutes	At what interval?

7.6.11 Diagnostic messages

Designation	Values	Description
<i>Send general error cyclically</i>	no Yes	Which messages should be sent cyclically?
<i>Send lamp failure cyclically</i>	no Yes	
<i>Send DALI fault cyclically</i>	no Yes	
<i>Cycle time for all diagnostic messages (if used)</i>	2 minutes, 3 minutes, 5 minutes, 10 minutes, 15 minutes, 20 minutes, 30 minutes, 45 minutes 60 minutes	At what interval?

7.6.12 Power failure and restoration

Designation	Values	Description
<i>Dimming value at restoration of the bus supply</i>	same as before failure 100%, 0%, 10%, 20%, 30% 40%, 50%, 60% 70%, 80%, 90%	Restore status before failure. Apply set value here. Here again the configured minimum dimming value will be taken into account.

The colour value for permanent is used as the colour.



Dimming value on mains restoration is fixed = Update

7.7 Parameters for the external inputs I1, I2 purely as KNX binary inputs

-  If direct control is not required, inputs I1 and I2 are available as KNX binary inputs.
-  The parameter *Control channel C1 directly* must be set to *no* for this purpose.

7.7.1 Input I1, I2: Switch function

Designation	Values	Description
<i>Function</i>	Switch.. <i>Push button..</i> <i>Dimming..</i> <i>Blinds..</i>	Desired use.
<i>Control channel C1 directly</i>	<i>No</i>	I1 is used purely as a KNX binary input. There is no internal connection to dimming actuator channel C1.
<i>Debounce time</i>	<i>30 ms, 50 ms, 80 ms</i> <i>100 ms, 200 ms,</i> <i>1 s, 5 s, 10 s</i>	In order to avoid a disruptive switching due to debouncing of the contact connected to the input, the new status of the input is only accepted after a delay time. Larger values (≥ 1 s) can be used as a switch-on delay
<i>Activate block function</i>	<i>no</i> <i>yes</i>	No block function. Show parameters for the block function.
<i>Block telegram</i>	Block with 1 (standard) <i>Block with 0</i>	0 = cancel block 1 = block 0 = block 1 = cancel block
<i>Send cyclically</i>	<i>every min</i> <i>every 2 min</i> <i>every 3 min</i> <i>...</i> <i>every 30 min</i> <i>every 45 min</i> <i>every 60 min</i>	Common cycle time for all 2 output objects of the channel.
<i>Number of telegrams</i>	<i>one telegram</i> <i>two telegrams</i>	Each channel has 2 output objects and can thus send up to 2 different telegrams.

7.7.1.1 Switch objects 1, 2

Each of the 2 objects can be configured individually on its own parameter page.

Designation	Values	Description
Object type	Switching (1 bit) Priority (2 bit) Value 0-255 Percentage value (1 byte)	Telegram type for this object.
Send if input = 1	<i>no</i> yes	Send if voltage is present at the input?
Telegram	With object type = switching 1 bit	
	ON OFF Change over	Send switch-on command Send switch-off command Invert current state (ON-OFF-ON etc.)
	With object type = priority 2 bit	
	no priority Priority On Priority Off	Function
		Value
		Priority inactive (no control) 0 (00 _{bin})
	Priority On	Priority ON (control: enable, on) 3 (11 _{bin})
		Priority OFF (control: disable, off) 2 (10 _{bin})
	With object type = value 0-255	
	0-255	Any value between 0 and 255 can be sent.
	With object type = percentage value 1 byte	
	0-100%	Any percentage value between 0 and 100% can be sent.
Send if input = 0	<i>no</i> yes	Send if no voltage is present at the input?
Telegram	See above: Same object type as Send if input = 1	
Send cyclically	no yes, always only if input = 1 only if input = 0	When should cyclical sending take place? The cycle time is set on the main parameter page of the channel.
Response after restoration of the bus supply ¹²	none update (immediately) update (after 5 s) update (after 10 s) update (after 15 s)	Do not send. Send update telegram immediately or with delay.
Response when the block is set	Ignore block no response as with input = 1 as with input = 0	The block function is ineffective. Do not respond when the block is set. Respond as with rising edge. Respond as with falling edge.
Response when cancelling the block	no response	Do not respond when the block is cancelled.

¹² DU 1 RF: Response after download or mains restoration

Designation	Values	Description
	<i>update</i>	Send update telegram.



If a channel is blocked, no telegrams will be sent cyclically.

7.7.2.1 Push button objects 1, 2

Each of the 2 objects can be configured individually on its own parameter page.

Designation	Values	Description
Object type	Switching (1 bit) Priority (2 bit) Value 0-255 Percentage value (1 byte)	Telegram type for this object.
Send after short operation	do not send Send telegram	Respond to short button push?
Telegram	With object type = switching 1 bit	
	On	Send switch-on command
	Off	Send switch-off command
	Change over	Invert current state (ON-OFF-ON etc.)
	With object type = priority 2 bit	
	no priority	Function Priority inactive (no control)
	Priority On	Value Priority ON (control: enable, on)
	Priority Off	Priority OFF (control: disable, off)
	With object type = value 0-255	
	0-255	Any value between 0 and 255 can be sent.
	With object type = percentage value 1 byte	
	0-100%	Any percentage value between 0 and 100% can be sent.
Send after long operation	do not send Send telegram	Respond to long button push?
Telegram	See above: Same object type as with short operation.	
Send after double-click	do not send Send telegram	Respond to double-click?
Telegram	See above: Same object type as with short operation.	
Send cyclically	no yes	The cycle time is set on the main parameter page of the channel.
Response after restoration of the bus	none	Do not send.

Designation	Values	Description
<i>supply</i> ¹³	<i>As with short (immediately)</i> <i>As with short (after 5 s)</i> <i>As with short (after 10 s)</i> <i>As with short (after 15 s)</i> <i>As with long (immediately)</i> <i>As with long (after 5 s)</i> <i>As with long (after 10 s)</i> <i>As with long (after 15 s)</i> <i>As with double-click (immediately)</i> <i>As with double-click (after 5 s)</i> <i>As with double-click (after 10 s)</i> <i>As with double-click (after 15 s)</i>	Send update telegram immediately or with delay. The value to be sent depends on the value configured for long button push, short button push or double-click.
<i>Response when the block is set</i>	<i>Ignore block</i> <i>no response</i> <i>as with short</i> <i>as with long</i> <i>as with double-click</i>	The block function is ineffective. Do not respond when the block is set. Respond as with a short button push. Respond as with a long button push. Respond as with a double-click.
<i>Response when cancelling the block</i>	<i>no response</i> <i>as with short</i> <i>as with long</i> <i>as with double-click</i>	Do not respond when the block is cancelled. Respond as with a short button push. Respond as with a long button push. Respond as with a double-click.

¹³ DU 1 RF: Response after download or mains restoration

Designation	Values	Description
<i>Time for double-click</i>	300 ms, 400 ms <i>500 ms, 600 ms</i> <i>700 ms, 800 ms</i> <i>900 ms, 1 s</i>	Serves to differentiate between a double-click and 2 single clicks. Time period in which the second click must begin, in order to recognise a double-click.

7.7.3.1 Double-click parameter page

Designation	Values	Description
Object type	Switching (1 bit) Priority (2 bit) Value 0-255 Percentage value (1 byte)	Telegram type for this object.
Telegram	With object type = switching 1 bit	
	On Off Change over	Send switch-on command Send switch-off command Invert current state (ON-OFF-ON etc.)
	With object type = priority 2 bit	
	no priority	Function: Priority inactive (no control) Value: 0 (00 _{bin})
	Priority On	Function: Priority ON (control: enable, on) Value: 3 (11 _{bin})
	Priority Off	Function: Priority OFF (control: disable, off) Value: 2 (10 _{bin})
	With object type = value 0-255	
	0-255	Any value between 0 and 255 can be sent.
Send cyclically	With object type = percentage value 1 byte	
	0-100%	Any percentage value between 0 and 100% can be sent.
	Do not send cyclically	
Response after restoration of the bus supply ¹⁵	do not send cyclically every min every 2 min every 3 min ... every 45 min every 60 min	How often should it be resent?
Response when the block is set	none As with double-click (immediately) As with double-click (after 5 s) As with double-click (after 10 s) ¹⁶ As with double-click (after 15 s)	Do not send. Send update telegram immediately or with delay. The value to be sent depends on the value configured for double-click.
	Ignore block no response as with double-click	The block function is ineffective. Do not respond when the block is set. Respond as with a double-click.

¹⁵ DU 1 RF: Response after download or mains restoration

¹⁶ DU 1 RF: Response after download or mains restoration

Designation	Values	Description
<i>Response when cancelling the block</i>	<i>no response</i>	Do not respond when the block is cancelled.
	<i>as with double-click</i>	Respond as with a double-click.

7.7.3.2 Dimming parameter page

Designation	Values	Description
<i>Response to long/short</i>	One button operation <i>brighter/On</i> <i>brighter/change over</i> <i>darker/Off</i> <i>darker/change over</i>	The input distinguishes between a long and a short button push, and can thus carry out 2 functions. The dimmer is operated with a single push button. Short button push = ON/OFF Long button push = brighter/darker Release = stop With the other variants, the dimmer is operated using 2 buttons (rocker). Short button push = ON Long button push = brighter Release = stop Short button push = ON/OFF Long button push = brighter Release = stop Short button push = OFF Long button push = darker Release = stop Short button push = ON/OFF Long button push = darker Release = stop
<i>Increment for dimming</i>	100% 50% 25% 12.5% 6% 3% 1.5%	With a long button push, the dimming value is: Increased (or decreased) until the button is released. Increased by the selected value (or reduced)
<i>Response after restoration of the bus supply¹⁷</i>	none <i>On</i>	Do not respond. Switch on dimmer

¹⁷ DU 1 RF: Response after download or mains restoration

Designation	Values	Description
	<i>Off</i> <i>ON after 5 s</i> <i>ON after 10 s</i> <i>ON after 15 s</i> <i>OFF after 5 s</i> <i>OFF after 10 s</i> <i>OFF after 15 s</i>	Switch off dimmer Switch on dimmer with delay Switch off dimmer with delay
<i>Response when the block is set</i>	<i>Ignore block</i> <i>no response</i> <i>On</i> <i>Off</i>	The block function is ineffective. Do not respond when the block is set. Switch on dimmer Switch off dimmer
<i>Response when cancelling the block</i>	<i>no response</i> <i>On</i> <i>Off</i>	Do not respond when the block is cancelled. Switch on dimmer Switch off dimmer

7.7.3.3 Dimming directly parameter page

See Parameters for direct control of the dimming actuator.

7.7.4 Input I1, I2: Blinds function

Designation	Values	Description
Channel function	Switch.. Push button.. Dimming.. Blinds.. Window contact..	The input controls a blinds actuator.
Control channel C1 directly	No	I1 is used purely as a KNX binary input. There is no internal connection to dimming actuator channel C1.
Debounce time	30 ms, 50 ms, 80 ms 100 ms, 200 ms,	In order to avoid a disruptive switching due to debouncing of the contact connected to the input, the new status of the input is only accepted after a delay time.
Activate block function	no yes	No block function. Parameter page Show block function.
Block telegram	Block with 1 (standard) Block with 0	0 = cancel block 1 = block 0 = block 1 = cancel block
Long button push starting at	300 ms, 400 ms 500 ms, 600 ms 700 ms, 800 ms 900 ms, 1 s	Serves to clearly differentiate between long and short button push. If the button is pressed for at least as long as the set time, then a long button push will be registered.
Double-click additional function	no yes	No double-click function The Double-click parameter page is displayed.
Time for double-click	300 ms, 400 ms 500 ms, 600 ms 700 ms, 800 ms 900 ms, 1 s	Serves to differentiate between a double-click and 2 single clicks. Time period in which the second click must begin, in order to recognise a double-click.

7.7.4.1 Double-click parameter page

Designation	Values	Description
Object type	Switching (1 bit) Priority (2 bit) Value 0-255 Percentage value (1 byte) Height % + slat %	Telegram type for this object.
Telegram	With object type = switching 1 bit	
	On Off Change over	Send switch-on command Send switch-off command Invert current state (ON-OFF-ON etc.)
	With object type = priority 2 bit	
	no priority	Function Priority inactive (no control)
	Priority On	Value Priority ON (control: enable, on)
	Priority Off	Priority OFF (control: disable, off)
	With object type = value 0-255	
	0-255	Any value between 0 and 255 can be sent.
	With object type = percentage value 1 byte	
	0-100%	Any percentage value between 0 and 100% can be sent.
	With object type = height % + slat %	
	Height (0-100%)	Upon double-click 2 telegrams are sent simultaneously: Desired height of blinds
	Slat (0-100%)	Desired slat position.
Send cyclically	do not send cyclically every min every 2 min every 3 min ... every 45 min every 60 min	How often should it be resent?
Response after restoration of the bus supply ¹⁸	none As with double-click (immediately) As with double-click (after 5 s) As with double-click (after 10 s) As with double-click (after 15 s)	Do not send. Send update telegram immediately or with delay. The value to be sent depends on the value configured for double-click.
Response when the block is set	Ignore block	The block function is ineffective.

¹⁸ DU 1 RF: Response after download or mains restoration

Designation	Values	Description
	<i>no response</i>	Do not respond when the block is set.
	<i>as with double-click</i>	Respond as with a double-click.
<i>Response when cancelling the block</i>	<i>no response</i>	Do not respond when the block is cancelled.
	<i>as with double-click</i>	Respond as with a double-click.

7.7.4.2 Blinds parameter page

Designation	Values	Description
<i>Operation</i>	One button operation <i>Down</i> <i>Up</i>	The input distinguishes between a long and a short button push, and can thus carry out 2 functions. The blinds are operated with a single push button. Short button push = step. Long button push = move. Short button push = step. Long button push = lower. Short button push = step. Long button push = raise.
<i>Movement is stopped by</i>	<i>Releasing the button</i> Short operation	How is the stop command to be triggered?
<i>Response after restoration of the bus supply¹⁹</i>	none <i>Up</i> <i>Down</i> <i>after 5 s Up</i> <i>after 10 s Up</i> <i>after 15 s Up</i> <i>after 5 s Down</i> <i>after 10 s Down</i> <i>after 15 s Down</i>	Do not respond. Raise blinds Lower blinds Raise blinds with delay Lower blinds with delay
<i>Response when the block is set</i>	Ignore block <i>no response</i> <i>Up</i> <i>Down</i>	The block function is ineffective with this telegram. Do not respond when the block is set. Raise blinds Lower blinds
<i>Response when cancelling the block</i>	no response <i>Up</i> <i>Down</i>	Do not respond when the block is cancelled. Raise blinds Lower blinds

¹⁹ DU 1 RF: Response after download or mains restoration

7.7.5 Input I2: Temperature input function²⁰

Designation	Values	Description
Channel function	Switch.. Push button.. Dimming.. Blinds.. Temperature input	The input is connected to a temperature sensor
Temperature calibration	-64..+64 (x 0.1 K)	Correction value for temperature measurement if sent temperature deviates from the actual ambient temperature. Example: temperature = 20 °C sent temperature = 21 °C Correction value = 10 (i.e. 10 x 0.1 °C)
Send temperature in the event of change of	not due to a change	Only send cyclically (if enabled)
	0.2 K 0.3 K 0.5 K 0.7 K 1 K 1.5 K 2 K	Send if the value has changed by the selected amount since the last transmission.
Send temperature cyclically	do not send cyclically every min, every 2 min every 3 min ... every 45 min every 60 min	How often should the current measured value be resent?



Applicable sensor types:

temperature sensor UP (9070496)

remote sensor IP 65 (9070459)

floor sensor (9070321)

²⁰ The temperature input function is only possible with input I2.

7.8 Parameters for direct control of the dimming actuator

i The parameter *Control channel C1 directly* determines whether the input functions as a direct control for C1 or purely as a KNX binary input.
Input I1 is configured for direct control of the actuator in the ETS default setting.
A push button connected to I1 will therefore have a direct internal effect on channel C1.

i If the operation of the dimmer requires 2 push buttons (dimming brighter/darker), i.e. 2 inputs, then I2 will be automatically configured for direct control.

i If the operation of the dimmer requires only one push button (one button operation), then input I2 is freely available as a KNX binary input.

i If an input is configured for direct control, it has no bus connection, i.e. no communication objects.

²¹ Direct control: This parameter is only available at I1 and only for the dimming function.
²² Applies here to I1, and for I2 if used.
²³ Applies here to I1, and for I2 if used.
²⁴ Applies here to I1, and for I2 if used.

7.8.2 Dimming I1 directly parameter page

Designation	Values	Description
<i>Response to long/short</i>	<i>One button operation</i>	The input distinguishes between a long and a short button push, and can thus carry out 2 functions. The dimmer is operated with a single push button. Short button push = ON/OFF Long button push = brighter/darker Release = stop i I2 is not required, and freely available. <i>With the other variants, the dimmer is operated using 2 buttons (rocker).</i>
	<i>brighter/On</i>	Short button push = ON Long button push = brighter Release = stop i I2 is automatically preallocated with <i>darker/Off</i>.
	<i>brighter/change over</i>	Short button push = ON/OFF Long button push = brighter Release = stop i I2 is automatically preallocated with <i>darker/change over</i>.
	<i>darker/Off</i>	Short button push = OFF Long button push = darker Release = stop i I2 is automatically preallocated with <i>brighter/On</i>.

Designation	Values	Description
	<i>darker/change over</i>	Short button push = ON/OFF Long button push = darker Release = stop  I2 is automatically preallocated with <i>brighter/change over.</i>
<i>Increment for dimming</i>	100% 50% 25% 12.5% 6% 3% 1.5%	With a long button push, the dimming value is: Increased (or decreased) until the button is released. Increased by the selected value (or reduced)

7.8.3 Double-click parameter page

Designation	Values	Description
<i>Dimming value on double-click</i>	0-100%	Desired dimming value.

7.8.4 Dimming I2 directly

This parameter page is shown if I2 is required for direct control.

This is the case if, on the **Dimming input I1 directly** parameter page, the parameter *Response to long/short* is **not** set to *One button operation*, and therefore a second push button is required for the opposite direction.

i If the dimmer is operated with only one push button (one button operation), then input I2 is freely available as a KNX binary input.

Designation	Values	Description
<i>Response to long/short</i> ²⁵	<i>brighter/On</i>	If I1 = darker/OFF
	<i>brighter/change over</i>	If I1 = darker/change over
	<i>darker/Off</i>	If I1 = brighter/ON
	<i>darker/change over</i>	If I1 = brighter/change over
<i>Double-click additional function</i>	no	No double-click function
	<i>yes</i>	Parameter <i>Dimming value on double-click</i> is shown.
<i>Dimming value on double-click</i>	0-100%	Desired dimming value.

i The following settings are taken over from I1, and do not have to be entered again at I2:
Debounce time, long button push from, time for double-click.

²⁵ Automatically preset, not changeable.

8 Application examples

8.1 Direct control: Basic configuration

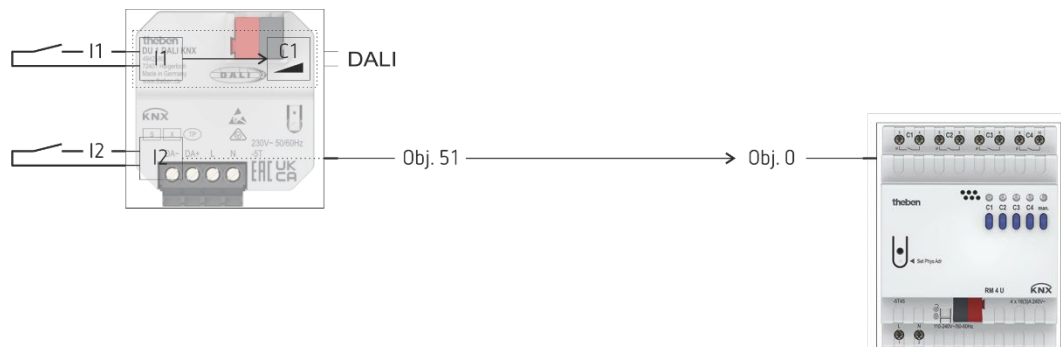
In this configuration, dimming channel C1 is operated directly with a push button connected to I1.

In this case, I2 is purely a KNX binary input²⁶ without direct control, controlling a switch actuator RM 4 U.

8.1.1 Devices

- DU 1 DALI KNX (4942580)
- RM 4 U (4940223)

8.1.2 Overview



²⁶ Since the parameter of I1, *Response to long/short*, is set to *One button operation*, I2 is not necessary for the direct control of the dimmer.

8.1.3 Objects and links

The communication objects of C1 are all available for further functions.
A basic function (C1 On/Off, brighter/darker) is provided by operating the push button at I1.

In this case, input I1 has no communication objects.

No.	DU 1 DALI KNX	No.	RM 4 U	Comment
	Object name		Object name	
51	Channel I2.1 - switching	0	Channel C1 - switch object	Push button at I2 switches the first channel of the RM 4 U.

8.1.4 Important parameter settings

Standard or customer-defined parameter settings apply to unlisted parameters.

DU 1 DALI KNX

Parameter page	Parameters	Setting
General	<i>Use binary inputs</i>	Yes
C1 configuration options	Most parameters on the Configuration options page are only relevant in conjunction with communication objects, and are not considered in any more detail here.	
External inputs		
I1 configuration options	<i>Function</i>	<i>Dimming</i>
	<i>Control channel C1 directly</i>	<i>yes</i>
Dimming directly	<i>Response to long/short</i>	<i>One button operation</i>
I2 configuration options ²⁷	<i>Function</i>	<i>Push button</i>
Push button object 1	<i>Object type</i>	<i>Switching</i>
	<i>Telegram</i>	<i>Change over</i>

RM 4 U:

Parameter page	Parameters	Setting
Configuration options	Channel function	Switching On/Off
	Activation of function via	Switch object

²⁷ Since the parameter of I1, *Response to long/short*, is set to *One button operation*, I2 is not necessary for the direct control of the dimmer.

8.2 Controlling the dimming channel via the bus

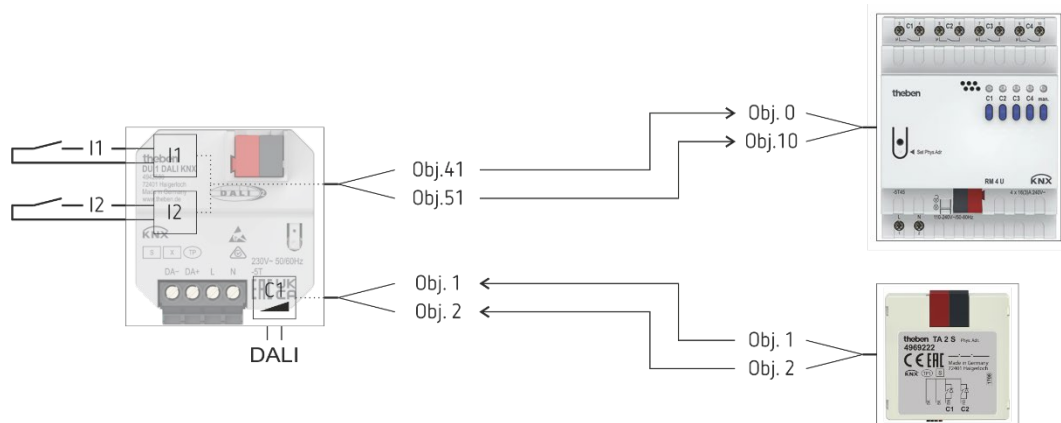
In this example, the external inputs and the dimming actuator channel are completely separate from each other and can only be used via the KNX bus.²⁸

Dimming channel C1 is operated by means of a KNX push button interface (TA 2 S). The external inputs I1, I2 control a switch actuator (RM 4 U).

8.2.1 Devices

- DU 1 DALI KNX (4942580)
- RM 4 U (4940223)
- TA 2 S (4969222)

8.2.2 Overview



²⁸ Normal KNX operation, without direct control.

8.2.3 Objects and links

No.	DU 1 DALI KNX	No.	RM 4 U	Comment
	Object name		Object name	
41	<i>Channel I1.1 – switching</i>	0	<i>Channel C1 - switch object</i>	The external inputs control switch actuator RM 4 U
51	<i>Channel I2.1 - switching</i>	10	<i>Channel C2 - switch object</i>	

No.	TA 2 S	No.	DU 1 DALI KNX	Comment
	Object name		Object name	
1	<i>Channel I1 - switching</i>	1	<i>Channel C1 – switching On/Off</i>	The push button interface controls dimming channel C1.
2	<i>Channel I1 – brighter/darker</i>	2	<i>Channel C1 – brighter/darker</i>	

8.2.4 Important parameter settings

Standard or customer-defined parameter settings apply to unlisted parameters.

DU 1 DALI KNX:

Parameter page	Parameters	Setting
General	<i>Use binary inputs</i>	<i>Yes</i>
C1 configuration options	No specific configuration required. The dimmer can be configured with the standard or customer-defined <i>parameter settings</i> .	
External inputs		
I1, I2 configuration options	<i>Function</i>	<i>Push button</i>
	<i>Control channel C1, C2 directly</i>	no
Push button object 1	<i>Object type</i>	<i>Switching</i>
	<i>Telegram</i>	<i>Change over</i>
Push button object 2	<i>Object type</i>	<i>Switching</i>
	<i>Telegram</i>	<i>Change over</i>

RM 4 U:

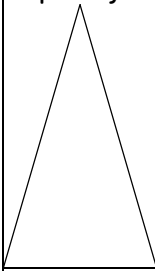
Parameter page	Parameters	Setting
Configuration options	<i>Channel function</i>	<i>Switching On/Off</i>
	<i>Activation of function via</i>	<i>Switch object</i>

TA 2 S:

Parameter page	Parameters	Setting
Channel 1 configuration options	<i>Channel 1 function</i>	<i>Dimming</i>
Dimming	<i>Response to long/short</i>	<i>One button operation</i>

9 Appendix

9.1 Priority order

	1	Permanent On	The dimming values for Permanent Off are ignored during Permanent On.
	2	Permanent Off	The dimming values for Force are ignored during Permanent Off.
	3	Force	The dimming values for Block and Scene are ignored during Force.
	4	Block, scene	During a block, the objects for switching are ignored. However, they will be processed if they are needed when the block is cancelled. Block and scene are equal.
Lowest priority	5	Switching	A new object overwrites the switching status of previous objects. All objects are equal.

9.2 Using the soft switch function

9.2.1 General

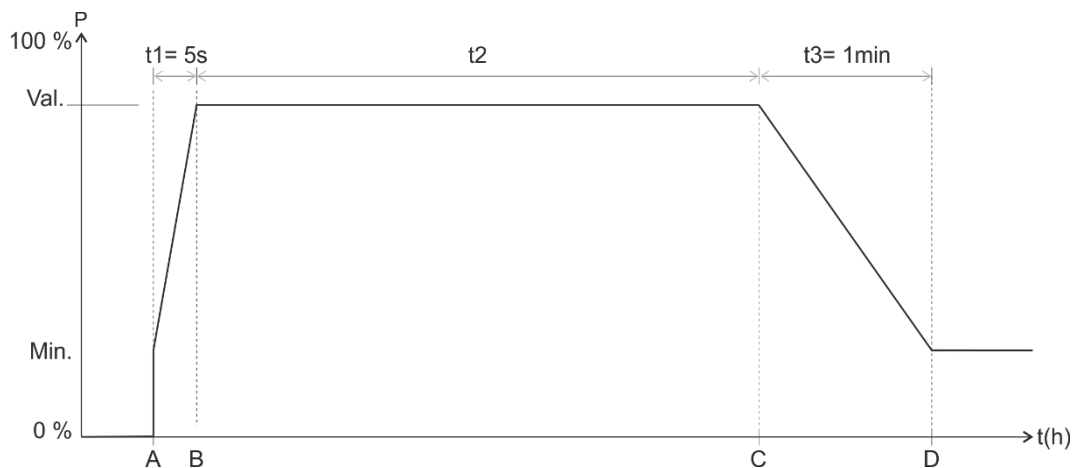
The soft switch function is a cycle consisting of switching on, dimming up, maintaining target brightness, dimming down and switching off.

9.2.2 Soft switching for staircase lighting

The following function is recommended for staircase lighting:

When the light push button is operated: Full brightness.

After the desired time has elapsed: Slow dimming down and basic lighting.



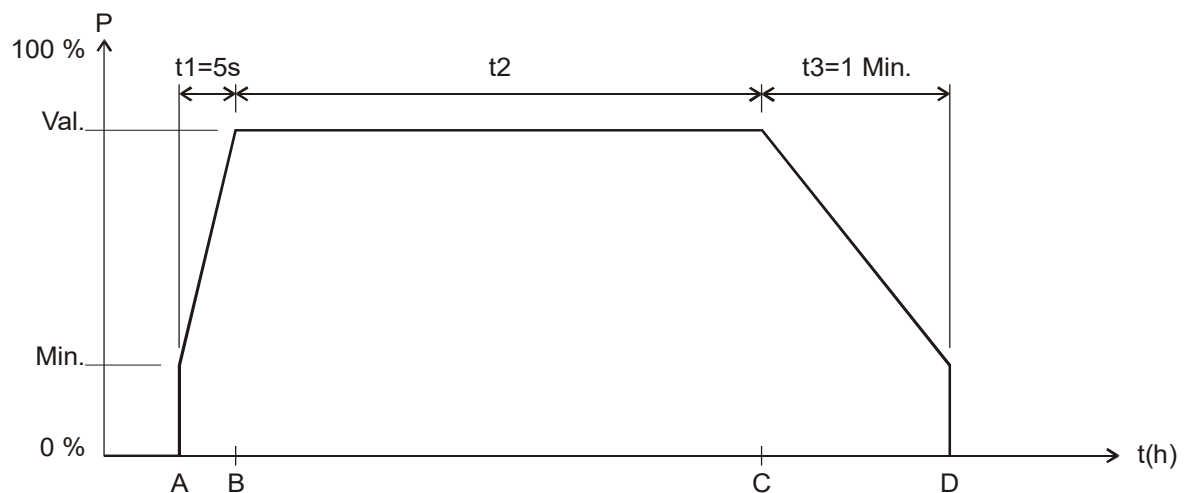
A	Push button sends <i>Soft ON</i> telegram.
t1	The <i>Soft ON</i> time is equal to 0, i.e. the "Dim up slowly" function is deactivated
B	The brightness is immediately adjusted to the configured value after <i>Soft ON</i>
t2	Configured <i>Time between Soft ON and Soft OFF</i> ²⁹ elapses
t2+	Perhaps, t2 has been extended with another <i>Soft ON</i> telegram
C	t2 or t2+ has elapsed, or a <i>Soft OFF</i> telegram was received: Start of the <i>Soft OFF</i> phase
t3	the brightness is gradually reduced within the configured time for <i>Soft OFF</i>
D	t3 has elapsed and it is dimmed to the configured value after <i>Soft OFF</i> (e.g. 25%). The configured minimum and maximum dimming value is taken into account

The light can be switched off with a *Soft OFF* telegram or dimmed to the value after *Soft OFF*. A *Soft ON* telegram can be used to retrigger.

²⁹ *Soft OFF* via configured time or via *Soft OFF* telegram.

9.2.3 Driveway lighting

A motion detector activates the dimmer via the *Soft switching* object.
The lighting is dimmed up within 5 seconds if a movement is detected.
This delay gives the eyes enough time to adjust to the light without being dazzled.
The lighting is gradually dimmed down within a minute and then switched off after the configured time has elapsed or a Soft OFF telegram is received via the push button or via the motion detector (cyclic).

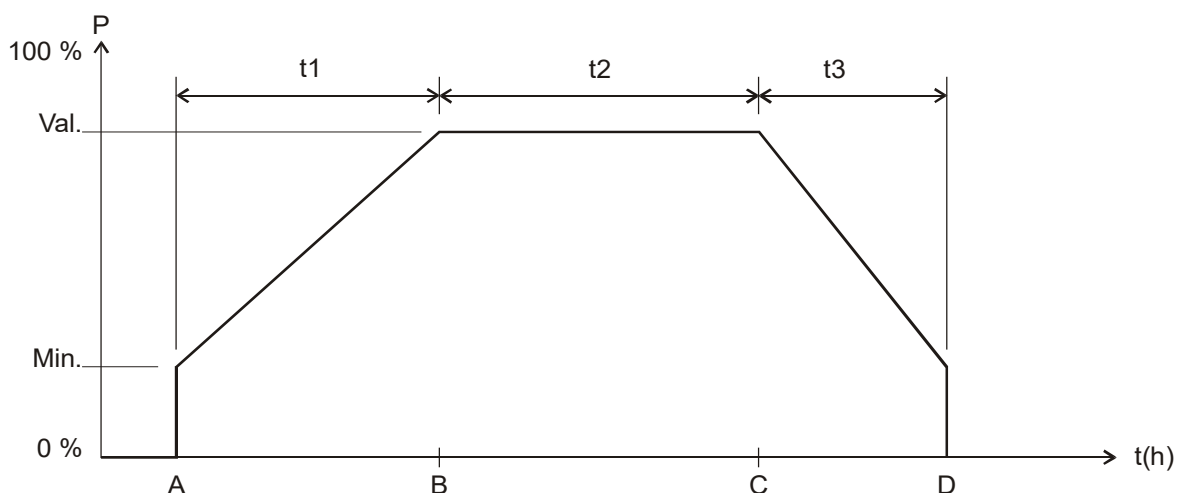


A	<i>Soft ON</i> is sent by the motion detector: The brightness is immediately adjusted to the configured <i>Minimum dimming value</i>
t1	The brightness is gradually increased within the configured time for <i>Soft ON</i> (5 s)
B	Configured value after <i>Soft ON</i> is reached
t2	Time between <i>Soft ON</i> (1) and <i>Soft OFF</i>
C	<i>Soft OFF</i> telegram was received or configured time has elapsed: Start of the <i>Soft OFF</i> phase
t3	The brightness is gradually reduced within the configured time for <i>Soft Off</i>
D	t3 has elapsed and it is dimmed to the configured value after <i>Soft Off</i> (0%). The configured minimum and maximum dimming value are taken into account.

9.2.4 Simulation of daily routine

Using a time switch, it is possible to simulate an entire daily routine with sunrise and sunset. To do this, the *Time between Soft ON and Soft OFF* parameter will be set to *Until Soft OFF telegram* (See object *Soft switching*).

The time switch sends a Soft ON telegram (=1) in the morning and a Soft OFF telegram (=0) in the evening to object *Soft switching*.



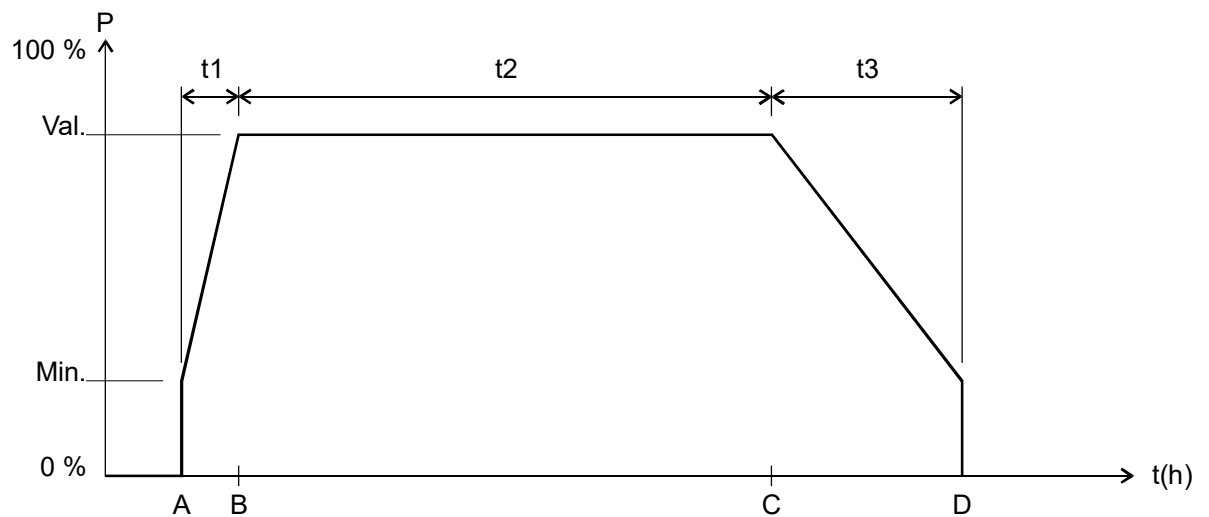
Min.	Configured <i>Minimum dimming value</i>
Val.	Target dimming value, i.e. configured <i>Dimming value after Soft ON</i>
t(h)	Time sequence

A	<i>Soft ON</i> is sent by the timer: The brightness is immediately adjusted to the configured <i>Minimum dimming value</i>
t1	The brightness is gradually increased within the configured <i>Time for Soft ON</i>
B	Configured <i>Value after Soft ON</i> is reached
t2	<i>Time between Soft ON (1) and Soft OFF telegram (0)</i> programmed in the time switch
C	<i>Soft OFF</i> telegram has been received: Start of the <i>Soft OFF</i> phase
t3	The brightness is gradually reduced within the configured <i>Time for Soft Off</i>
D	t3 has elapsed and it is dimmed to the configured value after <i>Soft OFF</i> (0%). The configured minimum and maximum dimming value are taken into account

9.2.5 Retriggering and premature switch off

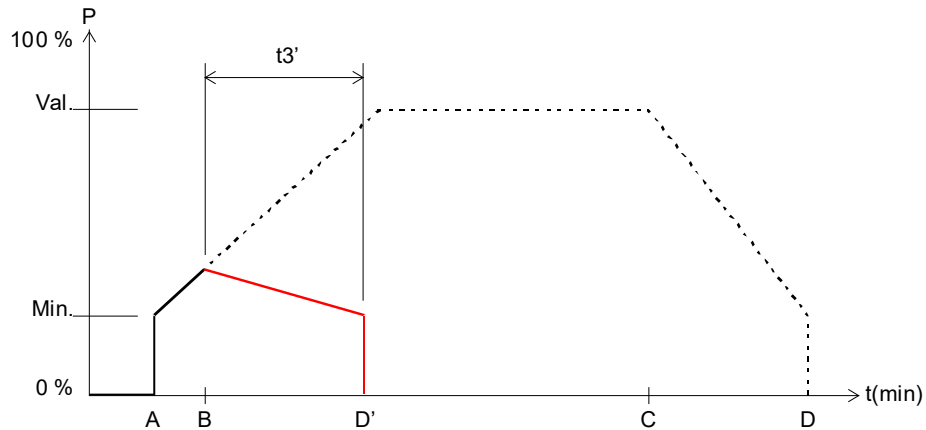
It is also possible to influence the soft switching process while it is still active. Depending on which phase is currently being executed, the following responses can be triggered by Soft ON and Soft OFF telegrams.

Telegram	Response
Soft ON during t1	none
Soft ON during t2	t2 is restarted
Soft ON during t3	a new Soft ON process is started. See below.
Soft OFF during t1	The Soft ON process is stopped and the Soft OFF phase started immediately. See below.
Soft OFF during t2	the Soft OFF phase starts immediately
Soft OFF during t3	none

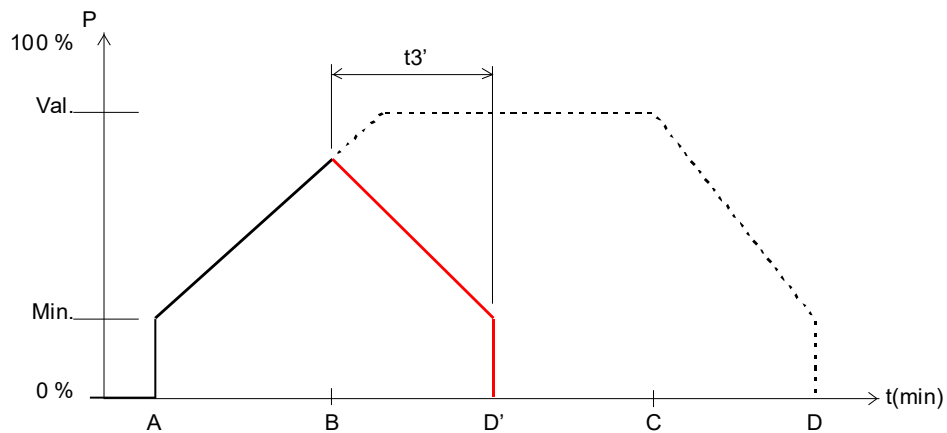


9.2.6 Soft OFF telegram during a Soft ON process

The duration of the Soft OFF phase ($t3'$) is always equivalent to the configured time, regardless of the current dimming value.



Example 1: Soft OFF at the start of the Soft ON phase.

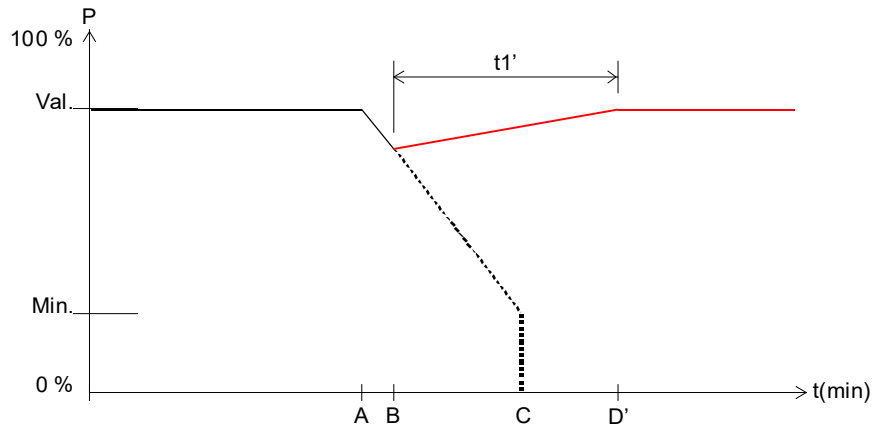


Example 2: Soft OFF at the end of the Soft ON phase.

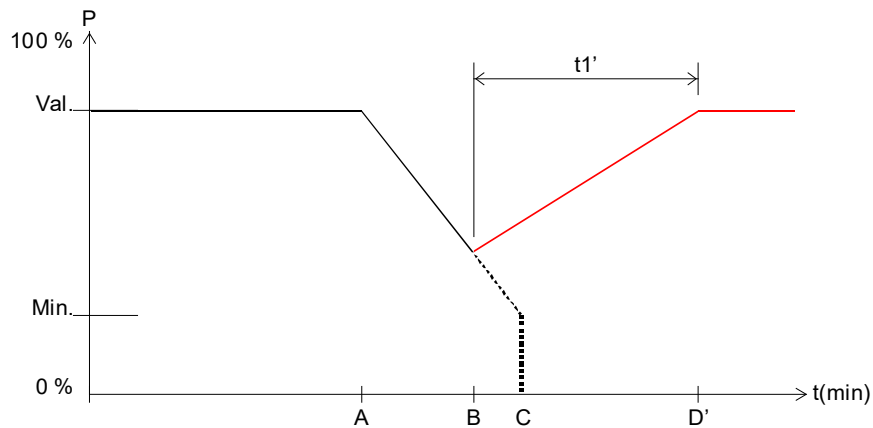
A	A Soft ON process is started
B	A Soft OFF telegram is received: The Soft ON phase is interrupted and a Soft OFF phase starts.
$t3'$	Duration of the Soft OFF phase = configured Soft OFF time
D'	End of the Soft OFF phase

9.2.7 Soft ON telegram during a Soft OFF process

The duration of the Soft ON phase (t_1') is always equivalent to the configured time regardless of the current dimming value.



Example 3: Soft ON at the start of the Soft OFF phase.



Example 4: Soft ON at the end of the Soft OFF phase.

Sequence:

A	A Soft OFF process is started
B	A Soft OFF telegram is received: The Soft OFF phase is interrupted and a Soft ON phase starts.
t_1'	Duration of the Soft ON phase = configured Soft ON time
D'	End of the Soft ON phase

9.3 Using the force function

Example: Lighting with brightness control during the daytime and minimum lighting during the night.

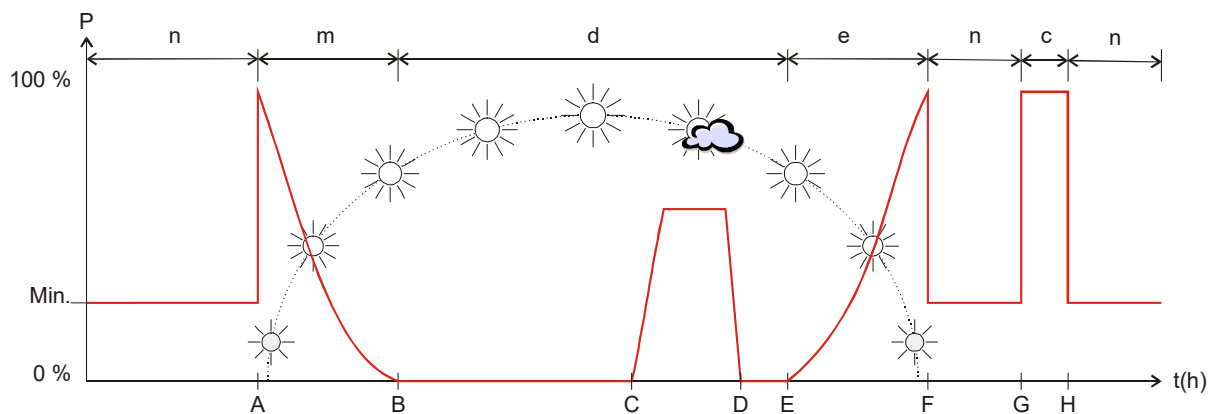
A brightness controller continuously measures the brightness of the room and controls the dimmer, to keep the brightness constant.

A dimming value of 20% is configured for forced operation.

In the evening at the close of work, the time switch activates forced operation, which dims down the brightness to 20%.

During the night, the lighting is switched on for a certain period of time by the night-watchmen via the central permanent ON function.

In the morning at the start of work, the time switch cancels the forced operation again and the dimmer is controlled by the brightness control.



A	Forced operation is cancelled by the time switch. As the daylight is not yet bright enough, the brightness control controls the dimmer
B	The daylight is now bright enough to illuminate the room, and the dimmer is switched off
C	Heavy cloud cover, the dimmer compensates for the lack of bright daylight
D	Clear sunshine, the dimmer is turned back down
E	Late afternoon, the dimmer gradually replaces the receding daylight
F	Forced operation is activated by the time switch The dimmer reduces the light to 20%
G	<i>Central permanent On = 1</i>
H	<i>Central permanent On = 0</i>
n	During the night time, the configured <i>value for forced operation</i> applies
c	Night round of security guards: The lighting is switched on via <i>central permanent On</i>
m	Morning: Daylight increases and the brightness control slowly reduces the dimming value
e	Evening: Daylight decreases and the brightness control slowly increases the dimming value
d	During the daytime, the dimmer is controlled by the lighting control according to the brightness of the sunlight

9.4 DALI EB

9.4.1 General

Only DALI EBs with lamps approved for this purpose may be connected to the dimmer.

In the dimming response, both manufacturer- and type-related differences are noticeable, therefore it is recommended to operate only EBs and lamps of the same type in parallel on one channel.

It may be necessary to adjust the minimum dimming value for each parameter.

9.5 4-bit telegrams (brighter/darker)

9.5.1 Telegram format 4-bit EIS 2 relative dimming:

Bit 3	Bits 0-1-2	
Direction	Dimming range divided into increments	
	Code	Increments
Dimming up: 1	000	Stop
Dimming down: 0	001	1
	010	2
	011	4
	100	8
	101	16
	110	32
	111	64 ³⁰

Examples: 1111 = dim brighter by 64 increments
 0111 = dim darker by 64 increments
 1101 = dim brighter by 16 increments

³⁰ typical application.

9.5.2 The parameters: *Switching on/off with a 4-bit telegram*

In general, the setting *yes* is required.

The setting *no* is available for use with special customer requests, e.g. in conference rooms.

The situation is described as follows:

A whole group of dimmer channels is operated by a push button (4-bit).

A certain lighting situation has been set by a scene or other means – e.g. channel 1 off, channel 2 40%, channel 3 50%. The requirement is to now dim up and increase the brightness of the entire scene, but the channels in the OFF state should remain off.

The parameters *Switching on/off with a 4-bit telegram* block the usual switch on/off function of the 4-bit telegram.

Parameter <i>Switch-on with 4-bit telegram</i>	4-bit Telegram	Dimmer output status	Response
<i>yes</i>	brighter/darker	Switched on (1%...100%)	Channel is normally dimmed.
	brighter	Off	Channel is switched on and dimmed brighter.
<i>no</i>	brighter	Off	Dimmer remains switched off.
	brighter/darker	Switched on (1%...100%)	Channel is normally dimmed.

Parameter <i>Switching off with a 4-bit telegram</i>	4-bit Telegram	Dimmer output status	Response
<i>yes</i>	brighter/darker	Switched on (1%...100%)	Channel is normally dimmed.
	darker	On	The channel is switched off if the push button is kept pressed for longer than approx. 2 s when the minimum brightness is reached.
<i>no</i>	darker	On	Channel can be dimmed down to the minimum brightness, but is not switched off.
	brighter/darker	Switched on (1%...100%)	Channel is dimmed in range from min. to 100% and remains switched on.

9.6 Scenes

9.6.1 Principle

The current status of a channel, or of a complete device, can be stored and retrieved later at any time via the scene function.

Each channel can participate simultaneously in up to 8 scenes.
Scene numbers 1 to 64 are permitted.

Permission to participate in scenes must be granted for the relevant channel via parameter.
See *Activate scenes* parameter and **Scenes** parameter page.

The current status is allocated to the appropriate scene number when a scene is saved.
The previously saved status is restored when a scene number is called up.

This allows a device to be easily and conveniently integrated into any user scene.

The scenes are permanently stored and can be retained even after the application has been downloaded again.
See "All channel scene statuses" parameter on the **Scenes** parameter page.

9.6.2 Calling up or saving scenes:

To call up or save a scene, the relevant code is sent to the corresponding scene object.

Scene	Call up		Save	
	Hex.	Dec.	Hex.	Dec.
1	\$00	0	\$80	128
2	\$01	1	\$81	129
3	\$02	2	\$82	130
4	\$03	3	\$83	131
5	\$04	4	\$84	132
6	\$05	5	\$85	133
7	\$06	6	\$86	134
8	\$07	7	\$87	135
9	\$08	8	\$88	136
10	\$09	9	\$89	137
11	\$0A	10	\$8A	138
12	\$0B	11	\$8B	139
13	\$0C	12	\$8C	140
14	\$0D	13	\$8D	141
15	\$0E	14	\$8E	142
16	\$0F	15	\$8F	143
17	\$10	16	\$90	144
18	\$11	17	\$91	145
19	\$12	18	\$92	146
20	\$13	19	\$93	147
21	\$14	20	\$94	148
22	15mins	21	\$95	149
23	\$16	22	\$96	150
24	\$17	23	\$97	151
25	\$18	24	\$98	152
26	\$19	25	\$99	153
27	\$1A	26	\$9A	154
28	\$1B	27	\$9B	155
29	\$1C	28	\$9C	156
30	\$1D	29	\$9D	157
31	\$1E	30	\$9E	158
32	\$1F	31	\$9F	159
33	\$20	32	\$A0	160
34	\$21	33	\$A1	161
35	\$22	34	\$A2	162
36	\$23	35	\$A3	163
37	\$24	36	\$A4	164
38	\$25	37	\$A5	165
39	\$26	38	\$A6	166
40	\$27	39	\$A7	167
41	\$28	40	\$A8	168
42	\$29	41	\$A9	169
43	\$2A	42	\$AA	170
44	\$2B	43	\$AB	171
45	\$2C	44	\$AC	172
46	\$2D	45	\$AD	173
47	\$2E	46	\$AE	174
48	\$2F	47	\$AF	175
49	\$30	48	\$B0	176
50	\$31	49	\$B1	177

Scene	Call up		Save	
	Hex.	Dec.	Hex.	Dec.
51	\$32	50	\$B2	178
52	\$33	51	\$B3	179
53	\$34	52	\$B4	180
54	\$35	53	\$B5	181
55	\$36	54	\$B6	182
56	\$37	55	\$B7	183
57	\$38	56	\$B8	184
58	\$39	57	\$B9	185
59	\$3A	58	\$BA	186
60	\$3B	59	\$BB	187
61	\$3C	60	\$BC	188
62	\$3D	61	\$BD	189
63	\$3E	62	\$BE	190
64	\$3F	63	\$BF	191

Examples (central or channel-related):

Call up status of scene 5:

→ Send \$04 to the relevant scene object.

Save current status with scene 5:

→ Send \$84 to the relevant scene object.

9.6.3 Teaching in scenes without telegrams

Instead of defining scenes individually by telegram, this can be done in advance in the ETS. This merely requires the *All channel scene statuses* parameter (**Scenes** parameter page) to be set to *Overwrite on download*.

The required status can then be selected for each of the 8 possible scene numbers of a channel (= *Status after download* parameter).

After the download, the scenes are already programmed into the device.

Later changes via teach-in telegrams are possible if required and can be permitted or blocked via a parameter.

9.6.4 Store light scenes in a push button

Scenes are normally stored in the dimmer itself. For this, the object *Call up/save scenes* is used.

However, if the lighting scenarios are to be stored **externally**, for example with a scene-capable push button, the following steps can be taken:

The dimmer has one dimming object (*dimming value*) and one feedback object (*feedback in %*). Thus, 2 group addresses are used, hereafter referred to as "Gr.addr.1" and "Gr.addr.2".

9.6.5 Allocation of group addresses and setting of object flags

	Object	Connect with	set to sending	Flags			
				C	R	W	T
PUSH BUTTON	Telegr. Brightness value	Gr.addr.1	yes	✓	-	✓	✓
		Gr.Adr.2	no				
DIMMER	Dimming value	Gr.addr.1	x	✓	-	✓	x
	Feedback in %	Gr.addr.1	no	✓	✓	-	x
		Gr.Adr.2	yes				

x = user-defined

Feedback to the dimmer should **not** be configured for *cyclical sending*.

Flags:

C = Communication

R = Read

W = Write

T = Transmit

9.7 Conversion of percentages to hexadecimal and decimal values

Percentage value	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Hexadecimal	00	1A	33	4D	66	80	99	B3	CC	E6	FF
Decimal	00	26	51	77	102	128	153	179	204	230	255

All values from 00 to FF hex. (0 to 255 dec.) are valid.