

LED Controller CC/CV

AKD-0260CC.02

AKD-0230CC.02

Further Documents:

Datasheet:

https://www.mdt.de/EN_Downloads_Datasheets.html

Assembly and Operation Instructions:

https://www.mdt.de/EN_Downloads_Instructions.html

Solution Proposals for MDT products:

<https://www.mdt.de/en/for-professionals/tips-tricks.html>

1 Content

2 Overview	4
2.1 Overview devices	4
2.2 Functions	5
2.3 Test function	6
2.4 Wiring diagram	7
2.5 Structure & Handling	8
2.6 Commissioning	8
3 Communication objects	9
3.1 Standard settings of the communication objects	9
4 ETS Parameter	13
4.1 General Settings	13
4.1.1 Diagnosis / Illuminant test	18
4.2 Central Communication objects (without parameters)	19
4.2.1 Alarms	19
4.2.2 Status: Output stage	19
5 Function selection – Single channels	20
5.1 Specific settings	20
5.2 Basic settings	22
5.2.1 Channel/Object description	22
5.2.2 Staircase light	23
5.2.3 Switch-on/switch-off delay	25
5.2.4 Switch-on behaviour	26
5.2.5 Dimming speed	29
5.2.6 Minimum/Maximum brightness	30
5.2.7 Switch-off via “Dimming relative”	31
5.2.8 Status output	32
5.2.9 Behaviour after reset	33
5.2.10 Central objects	34
5.2.11 Lock and Force functions	35
5.2.12 Scenes	39
5.2.13 Bit Scenes	42
5.2.14 Sequences	44
5.2.15 Time-dependent dimming	48
6 Function selection – Tunable White	51
6.1 Specific settings	51
6.2 Basic settings	52
6.2.1 Channel/Object description	52
6.2.2 Staircase light	53

6.2.3	Switch-on/Switch-off delay.....	54
6.2.4	Switch-on behaviour.....	55
6.2.5	Extended switch-on behaviour.....	58
6.2.6	Single-channel control.....	61
6.2.7	Switch-off/on with “Dimming relative”.....	62
6.2.8	Dimming speeds.....	63
6.2.9	Status output.....	64
6.2.10	Minimum/Maximum Brightness.....	65
6.2.11	Behaviour after reset.....	66
6.2.12	TW settings.....	67
6.2.12.1	Basic settings.....	67
6.2.12.2	Dim2Warm.....	69
6.2.13	Lock and Force functions.....	72
6.2.14	Scenes.....	77
6.2.15	Bit Scenes.....	80
6.2.16	Sequences.....	83
6.2.17	TW Human Centric Lighting (HCL).....	87
7	Index.....	90
7.1	List of figures.....	90
7.2	List of tables.....	91
8	Appendix.....	93
8.1	Legal provisions.....	93
8.2	Disposal.....	93
8.3	Assembly.....	93
8.4	History.....	93

2 Overview

2.1 Overview devices

This manual refers to the following devices (order number in bold).

- **AKD-0230CC.02** LED Controller CC/CV 30 W / 230 V AC, 2 channel
- **AKD-0260CC.02** LED Controller CC/CV 60 W / 230 V AC, 2 channel

2.2 Functions

Hybrid dimming

Optimised hybrid dimming for better light quality. The CC/CV LED controller uses the best of both dimming methods and combines dimming via amplitude and pulse width modulation (PWM). This ensures an optimum dimming behaviour over the entire dimming range of 0.2 ... 100 %. A Selectable dimming curve (linear, MDT quadratic, semi-logarithmic and logarithmic) to optimise the dimming behaviour of connected LEDs.

Human Centric Lighting (HCL)

Human Centric Lighting (HCL), allows an automatic light control similar to natural light, where brightness and colour spectrum are accordingly adjusted at set times or based on the location in coordination with the sunrise and sunset. The right light level and brightness through the day is essential for the well-being, where, visually, emotionally and the non visual impact of light are taken into account by HCL.

Automatic time-dependent dimming

In the operating mode “single channels”, the light can be dimmed depending on the time or the sunrise/sunset of the location. Up to 10 levels can be set. For example, 10 % brightness at night, 100 % during the day and 60 % in the evening. When the light is already switched on, a smooth transition between the light levels is given. The steps can be adjusted as required. Time-dependent dimming can be overridden at any time.

Dim2Warm

This function can be used to simulate the dimming of conventional light bulbs. Bright light has a colder and dark light a warmer colour tone. The colour temperatures and brightness values can be individually adjusted. (Requires Tunable White LEDs).

Lamp test and diagnosis

The lamp test informs about the load and the status of the outputs via a 14-byte object. Double safety by checking the DIP switch position in the application programme. If the DIP switch setting differs from the parameters in the application programme, the channels are prevented from being switched on, thus protecting the LED lamps from overcurrent/overvoltage.

Lock and Force function

Two lock or force functions can be set for each channel. These can be set as 1-bit, 2-bit or 1-byte objects and execute different actions when lock and unlock.

Scenes

Up to 8 scenes with different actions can be set for each channel. These can be, for example, the activation/deactivation of HCL, switch-on/switch-off commands, sequences, locking or dimming values.

Bit Scenes

Up to four 1-bit scenes with different actions can be set for each channel. 1-bit scenes can, for example, activate HCL, send switch-on/switch-off commands, start sequences, set locks or dimming values.

Sequences

Two sequences per channel can be used for presence simulation, as an example. Sequences contain up to 5 actions and can optionally be started in an endless loop. The behaviour after a sequence can be set, for example, after sequence 1, sequence 2, time-dependent dimming or HCL can be started.

(Extended) switch-on/switch-off behaviour

The dimming speeds (relative and absolute), the switch-on and switch-off speed and the minimum/maximum brightness can be set separately for “Day” and “Night”.

Example of extended switch-on behaviour at “Day”:

- Switch-on behaviour = time-dependent dimming
- Switch on again = Adjustable value 100 %

Staircase light function

By pressing the light push-button several times, the time in the LED controller can be added up or restarted to extend the staircase light if required. The “Prewarning” function dims the light and warns before the staircase light is switched off.

Updateable via DCA app

If necessary, the LED controller can be updated using the MDT update tool (DCA). The download is available free of charge at www.mdt.de and www.knx.org.

Long Frame Support

The LED controller supports “long frames” (longer telegrams). These contain more data per telegram, which significantly reduces the programming time.

2.3 Test function

The devices have a built-in test function that can be called up using the programming button.

A short press of the button activates the test function, a long press (> 1 s) activates the programming mode. The test mode activates the channels with the set switch-on value for manual operation (100 % if the device is not programmed). Switching is as follows:

- 1st short press of the programming button: Switch on channel A
- 2nd short press of the programming button: Switch on channel B
- 3rd short press of the programming button: Switch on all channels
- 4th short press of the programming button: Switch off all channels

Programming mode can be called up at any time.

2.4 Wiring diagram

The following pictures show the wiring diagrams for operation with constant current (LEDs in series connection) or constant voltage (LEDs in parallel connection):

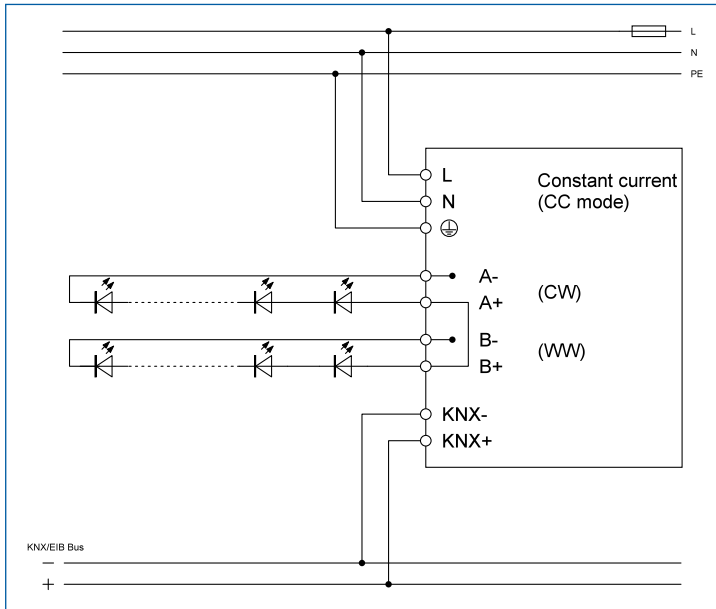


Figure 1: Wiring diagram – Constant current

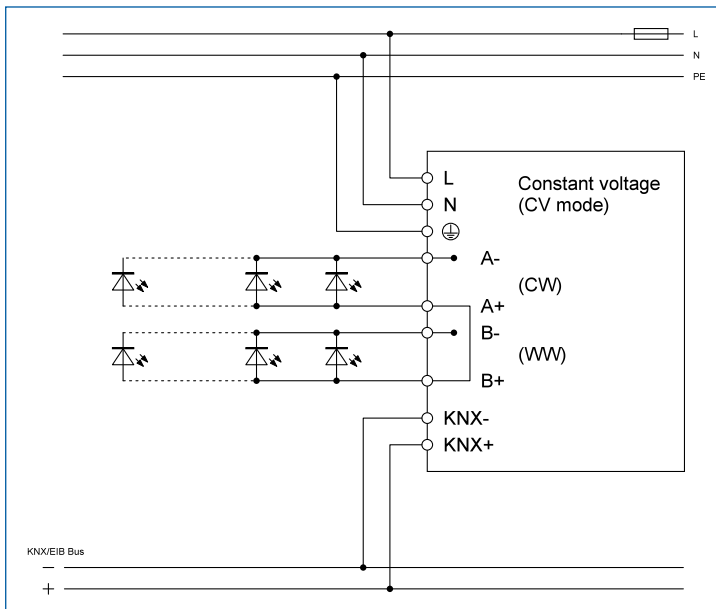


Figure 2: Wiring diagram – Constant voltage

2.5 Structure & Handling

The following picture shows the structure of the LED controller (here using the example AKD-0260CC.02):

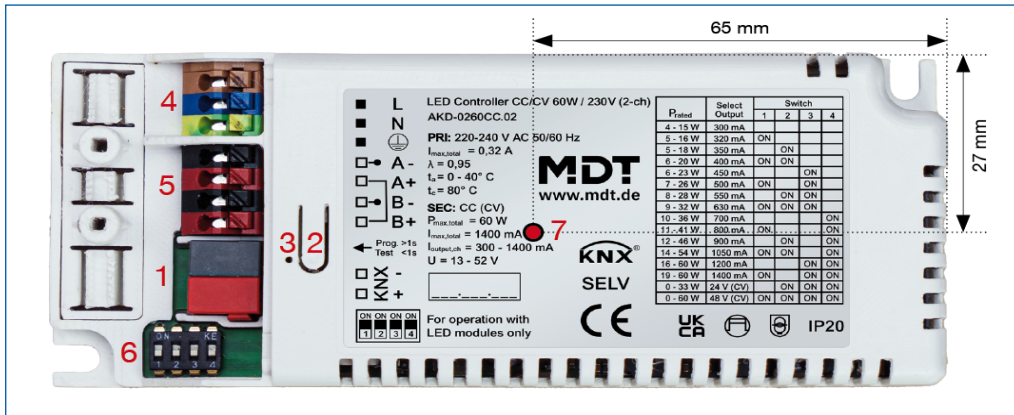


Figure 3: Structure & Handling

- | | |
|---------------------------------|------------------------|
| 1 = Bus connection terminal | 2 = Programming button |
| 3 = Red programming LED | 4 = Supply voltage |
| 5 = LED output | 6 = DIP-Switch |
| 7 = t_c (Housing temperature) | |

2.6 Commissioning

1. Wire the device according to the wiring diagram.
2. Connect programming interface to the bus.
3. Switch on bus voltage.
4. Press the programming button on the device (red programming LED lights up continuously).
5. Set and programme the individual address in the ETS. (Programming LED turns off)
6. Configure and programme the settings in the application programme.

3 Communication objects

3.1 Standard settings of the communication objects

The following tables show the default settings for the communication objects:

Standard settings - Single channels									
No.	Name	Object Function	Length	C	R	W	T	U	
0	Channel A:	Switch	1 Bit	■		■			
1	Channel A:	Staircase light	1 Bit	■		■			
2	Channel A:	Dimming relative	4 Bit	■		■			
3	Channel A:	Dimming absolute	1 Byte	■		■			
4	Channel A:	Status: On/Off	1 Bit	■	■		■		
5	Channel A:	Status: Dimming value	1 Byte	■	■		■		
6	Channel A:	Lock 1	1 Bit 2 Bit 1 Byte	■		■			
6	Channel A:	Lock 1 inverted	1 Bit	■		■			
7	Channel A:	Lock 2	1 Bit 2 Bit 1 Byte	■		■			
7	Channel A:	Lock 2 inverted	1 Bit	■		■			
8	Channel A:	Status: Lock	1 Bit	■	■		■		
9	Channel A:	Scene	1 Byte	■		■			
12	Channel A Bit Scene 1:	Start	1 Bit	■		■			
13	Channel A Bit Scene 2:	Start	1 Bit	■		■			
14	Channel A Bit Scene 3:	Start	1 Bit	■		■			
15	Channel A Bit Scene 4:	Start	1 Bit	■		■			
+16	next channel								

Standard settings - Single channels									
No.	Name	Object Function	Length	C	R	W	T	U	
52	Channel A Sequence 1:	Start/Stop	1 Bit	■		■			
53	Channel A Sequence 1:	Status	1 Bit	■	■		■		
54	Channel A Sequence 2:	Start/Stop	1 Bit	■		■			
55	Channel A Sequence 2:	Status	1 Bit	■	■		■		
+8	next channel (Sequence)								
56	Channel A Time-independent dimming:	Start/Stop	1 Bit	■		■			
57	Channel A Time-independent dimming:	Status	1 Bit	■	■		■		
+8	next channel (Time-independent dimming)								

Table 1: Communication objects – Standard settings: Single channels

Standard settings – Tunable White									
No.	Name	Object Function	Length	C	R	W	T	U	
0	TW Cold White:	Switch	1 Bit	■		■			
2	TW Cold White:	Dimming relative	4 Bit	■		■			
3	TW Cold White:	Dimming absolute	1 Byte	■		■			
4	TW Cold White:	Status: On/Off	1 Bit	■	■		■		
5	TW Cold White:	Status: Dimming value	1 Byte	■	■		■		
16	TW Warm White:	Switch	1 Bit	■		■			
18	TW Warm White:	Dimming relative	4 Bit	■		■			
19	TW Warm White:	Dimming absolute	1 Byte	■		■			
20	TW Warm White:	Status: On/Off	1 Bit	■	■		■		
21	TW Warm White:	Status: Dimming value	1 Byte	■	■		■		
32	TW:	Switch	1 Bit	■		■			
33	TW:	Staircase light	1 Bit	■		■			
34	TW Colour temperature (proportion of CW in %):	Dimming absolute	1 Byte	■		■			
35	TW Colour temperature (Kelvin):	Dimming absolute	2 Byte	■		■			

Standard settings – Tunable White									
No.	Name	Object Function	Length	C	R	W	T	U	
36	TW Brightness:	Dimming absolute	1 Byte	■		■			
37	TW Transition (colour temperature and brightness):	Dimming absolute	6 Byte	■		■			
38	TW Colour temperature (proportion of CW in %):	Dimming relative	4 Bit	■		■			
39	TW Brightness:	Dimming relative	4 Bit	■		■			
40	TW:	Status: On/Off	1 Bit	■	■		■		
41	TW Colour temperature (proportion of CW in %):	Status: Dimming value	1 Byte	■	■		■		
42	TW Colour temperature (Kelvin):	Status: Dimming value	2 Byte	■	■		■		
43	TW Brightness:	Status: Dimming value	1 Byte	■	■		■		
44	TW:	Scene	1 Byte	■		■			
45	TW Bit Scene 1:	Start	1 Bit	■		■			
46	TW Bit Scene 2:	Start	1 Bit	■		■			
47	TW Bit Scene 3:	Start	1 Bit	■		■			
48	TW Bit Scene 4:	Start	1 Bit	■		■			
49	TW:	Lock 1	1 Bit 2 Bit 1 Byte	■		■			
49	TW:	Lock 1 inverted	1 Bit	■		■			
50	TW:	Lock 2	1 Bit 2 Bit 1 Byte	■		■			
50	TW:	Lock 2 inverted	1 Bit	■		■			
51	TW:	Status: Lock	1 Bit	■	■		■		
52	TW Sequence 1:	Start/Stop	1 Bit	■		■			
53	TW Sequence 1:	Status	1 Bit	■	■		■		
54	TW Sequence 2:	Start/Stop	1 Bit	■		■			
55	TW Sequence 2:	Status	1 Bit	■	■		■		
56	TW HCL:	Start/Stop	1 Bit	■		■			
57	TW HCL:	Status	1 Bit	■	■		■		

Table 2: Communication objects – Standard settings: Tunable White

Standard settings – Central objects									
No.	Name	Object Function	Length	C	R	W	T	U	
68	Central	Switch	1 Bit	■		■			
69	Central	Dimming relative	4 Bit	■		■			
70	Central	Dimming absolute	1 Byte	■		■			
71	Central	Scene	1 Byte	■		■			
72	Central	Alarm: Overcurrent	1 Bit	■	■		■		
73	Central	Alarm: Overtemperature	1 Bit	■	■		■		
74	Central	Status: Output stage (230 V AC)	1 Bit	■	■		■		
75	Central	Calibration / Start illuminant test	1 Bit	■		■			
76	Central	Diagnosis text - Output	14 Byte	■	■		■		
80	Time	Receive current value	3 Byte	■		■	■		
81	Date	Receive current value	3 Byte	■		■	■		
82	Date/Time	Receive current values	8 Byte	■		■	■		
83	In operation	Output	1 Bit	■	■		■		
84	Day / Night	Day = 1 / Night = 0	1 Bit	■		■	■		
84	Day / Night	Night = 1 / Day = 0	1 Bit	■		■	■		

Table 3: Communication objects – Central objects

The table above shows the preset default settings. The priority of the individual communications objects and the flags can be adjusted by the user as required. The flags assign the communication objects their respective tasks in programming, where C stands for communication, R for read, W for write, T for transmit and U for update.

4 ETS Parameter

4.1 General Settings

This menu is used to make basic settings that apply across all functions. The specific settings will be described in chapters [5 Function selection – Single channels](#) and [6 Function selection – Tunable White](#).

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Device selection	<ul style="list-style-type: none"> ■ AKD-0260CC.02 LED Controller CC/CV 60 W ■ AKD-0230CC.02 LED Controller CC/CV 30 W 	Setting which device is to be configured.
Check setting of DIP switch	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the set power corresponds to the DIP setting.
Output setting	300 mA / 320 mA / 350 mA / 400 mA / 450 mA / 500 mA / 550 mA / 630 mA / 700 mA / 800 mA / 900 mA / 1050 mA / 1200 mA / 1400 mA / 24 V / 48 V [300 mA]	Setting the value for the output. <ul style="list-style-type: none"> ■ Only when „Check setting of DIP switch“ is active. <u>and</u> <ul style="list-style-type: none"> ■ Device selection „AKD-0260CC.02“
Output setting	150 mA / 170 mA / 200 mA / 220 mA / 250 mA / 270 mA / 300 mA / 350 mA / 400 mA / 450 mA / 500 mA / 550 mA / 630 mA / 700 mA / 24 V / 48 V [150 mA]	Setting the value for the output. <ul style="list-style-type: none"> ■ Only when „Check setting of DIP switch“ is active. <u>and</u> <ul style="list-style-type: none"> ■ Device selection „AKD-0260CC.02“
Startup time	2 ... 240 s [2 s]	Sets the time between restart and functional start-up of the device.
Send „In operation“ cyclically	not active 1 min – 24 h	Activation of a cyclical “In operation” telegram.
Function selection	<ul style="list-style-type: none"> ■ Singe channels ■ Tunable White 	Setting with which function the LED controller should work. The specific parameters for the two options are described in chapters 5 and 6!

ETS Text	Dynamic range [Default value]	Comment
Dimming curve	<ul style="list-style-type: none"> ■ MDT quadratic (recommended) ■ logarithmic ■ semi-logarithmic ■ linear 	Setting the dimming behaviour.
Dimming curves diagram	<input type="checkbox"/>	When activated (tick the box with a mouse click), a diagram with the progress of the curves appears.
Diagnosis / Illuminant test	<ul style="list-style-type: none"> ■ not active ■ active 	When activated, 2 objects are displayed. Description follows in chapter 4.1.1
“Day/Night” object	<ul style="list-style-type: none"> ■ not active ■ active, no request ■ active, request after reset 	Activation and setting of whether the “Day/Night” object should be requested automatically.
Value for “Day/Night”	<ul style="list-style-type: none"> ■ Day = 1 / Night = 0 ■ Day = 0 / Night = 1 	Setting the polarity for Day/Night switchover.
“Day/Night” switchover applies ...	<ul style="list-style-type: none"> ■ with next switch-on ■ direct 	Definition of when the switchover between Day and Night mode should take effect.
Automatic switchover of summertime	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the summer time switchover should take place automatically.
Location determination by	<ul style="list-style-type: none"> ■ coordinates ■ place 	Setting how the valid location is to be determined.
Location determination by „place“		
Country	any country [Germany]	Setting the country.
Town	any town [Engelskirchen]	Setting the town.
Location determination by „coordinates“		
Latitude	<ul style="list-style-type: none"> ■ North ■ South 	Determination of whether northern or southern latitude is to be counted.
Latitude in degrees [0° - 90°]	0° ... 90° [50°]	Determination of the latitude.
Latitude in minutes [0' - 59']	0' ... 59' [56']	Determining the minutes.

ETS Text	Dynamic range [Default value]	Comment
Longitude	<ul style="list-style-type: none"> ■ East ■ West 	Determination of whether eastern or western longitude is to be counted.
Longitude in degrees [0° - 180°]	0° ... 180° [6°]	Determination of the longitude.
Longitude in minutes [0' - 59']	0' ... 59' [57']	Determining the minutes.
Time difference from Universal time	any time zone [UTC+01:00 Amsterdam, Berlin]	Setting the time zone for calculating the position of the sun.

Table 4: General settings

Device selection

The database applies to both device versions. The device to be configured is determined here. The selection changes the output settings (different current values). All other parameters are the same.

DIP switch setting

If the “Check setting of DIP switch” parameter is active, a check is carried out between the value set under “Output setting” and the setting on the DIP switch (see imprint on the device).

Note: If the setting on the DIP switch does not match the parameter setting, the channels will not be switched on.

Note: The maximum total current of channel A+B is limited to 1400 mA (for AKD-0260CC.02) or 700 mA (for AKD-0230CC.02). If the maximum permissible maximum current is exceeded, the outputs are automatically balanced based on the brightness settings for channels A and B.

Startup time

This time defines when the device “boots up” after a restart (reset, reprogramming, bus voltage return). This can be important if, for example, a bus reset is carried out. If there are many devices on a line, all devices would start at the same time and place a load on the bus. With a variable time, the devices can start differently.

Send „In operation“ cyclically

The “In operation” telegram is used to show on the bus that the device is “alive”. If activated, an ON telegram is sent cyclically.

Dimming curve

Different illuminants behave differently during the dimming process. For example, the brightness changes only slightly at first and then abruptly in the upper dimming range. The behaviour can be adjusted by selecting a different dimming curve.

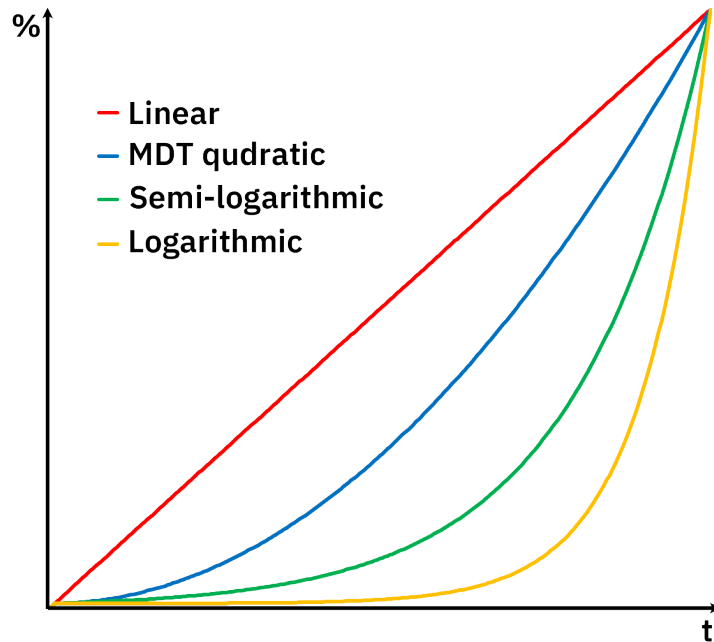


Figure 4: Diagram – Dimming curve progression

“Day/Night” object

The “Day/Night” object is used in various application settings to generate different behaviours for “Day” or “Night” mode. This can be switch-on/switch-off behaviour, switch-on/switch-off speeds or minimum/maximum brightness.

The “Day/Night switchover applies ...” parameter can be used to specify whether the switchover between “Day” and “Night” mode applies directly or only the next time it is switched on. With “next switch-on”, the channel must be switched to 0 % (Off) once. The changed settings are not applied until the next time it is switched on. If “direct” is selected, the minimum/maximum values for the brightness are adjusted and if the last switching command was an ON telegram, the channel is also dimmed according to the switch-on behaviour.

Automatic switchover of summertime

The time received always continues to run internally. In the event of a time changeover after the Central European time changeover for summertime, the device can carry out this changeover automatically, if the parameter has been activated.

Location determination

Location determination is relevant for calculating the sunrise and sunset times, which can be used for time-dependent dimming and “Human Centric Light” (HCL). The location can be determined either via the entered place or via coordinates.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
75	Central – Calibration / Start illuminant test	1 Bit	Triggering the illuminant test
76	Central – Diagnosis text - Output	14 Byte	Sending a text
80	Time – Receive current value	3 Byte	Receiving the time
81	Date – Receive current value	3 Byte	Receiving the date
82	Date/Time – Receive current values	8 Byte	Receiving the date and time
83	In operation – Output	1 Bit	Sending a cyclical “In operation” telegram
84	Day / Night – Day = 1 / Night = 0; Night = 1 / Day = 0	1 Bit	Receipt of a telegram for switching between Day and Night mode

Table 5: General communication objects

4.1.1 Diagnosis / Illuminant test

Two objects are displayed when the “**Diagnosis / Illuminant test**” parameter is activated. Sending a “1” to the “Start illuminant test” object triggers a check of the connected illuminants. A 14 Byte text is then output to the bus via the “Diagnosis text” object. The following messages are possible:

Message	Comment
INFO:Power OK	Output stage OK.
ERR: Power	Output stage does not respond / no 230 V AC.
ERR: Overload	Short circuit detected.
INFO: CurrDer.	Overload, maximum current power supply unit. Output power reduced.
ERR: Overl. UA	Exceeded voltage channel A > 52 V
ERR: Overl. UB	Exceeded voltage channel B > 52 V
WARN A: U Low	Undercut minimum voltage channel A < 8 V
WARN B: U Low	Undercut minimum voltage channel B < 8 V
ERR: TempHigh	Channels switched off/blocked due to overtemperature.
INFO: TempOk	Channels enabled again after overtemperature.
ERR:NoLoad ChA	No load detected on channel A. Switching on prevented.
ERR:NoLoad ChB	No load detected on channel B. Switching on prevented.
ERR: No Time	If HCL/time-dependent dimming is started - time not available.
INFO: Time Ok	If the time was received during the “No Time” error.
INFO: TempDer.	The output power was reduced due to the maximum temperature being exceeded.
INFO: Setting	DIP switch setting is output.
ERR: DIP-Switch	DIP switch setting does not correspond to the setting in the database.
Forced Cal Ch	Channel must be calibrated after changing the DIP switch. This is carried out automatically by the device once after the switch-off command.
Messages - illuminant test	
Start Ch x	Indication of the channel after starting the illuminant test.
INFO x: % U	Result (in %) if voltage limiting.
INFO x: % I	Result (in %) if current limiting.
INFO x: % P	Result (in %) if power limiting.
WARN A: U<13V	Undercut of the voltage, channel A < 13 V. Only after illuminant test
WARN B: U<13V	Undercut of the voltage, channel B < 13 V. Only after illuminant test

Table 6: Diagnosis texts

4.2 Central Communication objects (without parameters)

Some central communication objects are also available. These are permanently displayed and are not assigned to any parameter.

4.2.1 Alarms

The LED controller has 2 different alarms. One is an overcurrent alarm, which is activated as soon as at least one channel is carrying a too high current. The second is an overtemperature alarm, which is activated as soon as the output stage becomes too hot.

If the overcurrent alarm is active, the channel that is carrying a too high current is switched off.

All channels are switched off in the event of an overtemperature alarm. This prevents damage to the device. An active alarm is indicated via the respective communication object with a logical "1". The alarm resets automatically as soon as there is no longer an error. A logical "0" is sent in this case. However, the affected channel or the output stage will not switch back on independently afterwards, but must be switched on again with a renewed switching command.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
72	Central – Alarm: Overcurrent	1 Bit	Sending/cancelling an alarm
73	Central – Alarm: Overtemperature	1 Bit	Sending/cancelling an alarm

Table 7: Communication objects – Alarms

4.2.2 Status: Output stage

The object sends a "0" if the supply voltage of 230 V AC is not present at the input of the output stage. If the supply voltage is present, a "1" is sent.

The following table shows the corresponding communication object:

Number	Name / Object function	Length	Usage
74	Central – Status: Output stage (230 V AC)	1 Bit	Output of the current status, whether the supply voltage is present.

Table 8: Communication objects – Status: Output stage

5 Function selection – Single channels

Note: The function selection is made in the “General settings” menu. Depending on the selection, in addition to the settings - see chapter [4.1 General Settings](#) – further specific parameters are displayed, which are described in the following chapter.

5.1 Specific settings

The following table shows the specific settings available for the function selection “Single channels” in the “General settings” menu:

ETS Text	Dynamic range [Default value]	Comment
Channel A / B	<ul style="list-style-type: none"> ■ not active ■ active 	Activation of the corresponding channel.
Assignment of outputs	<ul style="list-style-type: none"> ■ normal (A -> A, B -> B) ■ swapped (A -> B, B -> A) ■ synchronous (channel B applies settings from channel A) 	Setting how the channels are assigned according to the connection.
Wiring diagram	Display of a graphic	Graphic is displayed according to the “Assignment of outputs” selection.
Global dimming speeds		
Switch-on speed „Day“ / „Night“	0 ... 14400 s [2 s]	Setting the time for a “soft start” of the light source in “Day” or “Night” mode.
Switch-off speed “Day” / “Night”	0 ... 14400 s [2 s]	Setting the time for a “soft off” of the light source in “Day” or “Night” mode.
Switch-on speed	0 ... 14400 s [2 s]	Setting the time for a “soft start” if “Day/Night” is not active.
Switch-off speed	0 ... 14400 s [2 s]	Setting the time for a “soft off” if “Day/Night” is not active.
Speed “Dimming relative”	0 ... 120 s [10 s]	Setting the time for dimming from 0 % to 100 % or from 100 % to 0 % via relative dimming commands.
Speed “Dimming absolute”	0 ... 120 s [2 s]	Setting the time for dimming from 0 % to 100 % or from 100 % to 0 % via absolute dimming commands.

Table 9: Specific settings – Single channels

Channel activation

A separate menu item “Channel A:” or “Channel B:” appears in the left-hand menu for each activated channel.

Assignment of outputs

There are various options for assigning the illuminants. The respective selection is shown in a graphic in the “Wiring diagram” parameter below.

- **normal:** The assignment of the illuminants at the input corresponds to the assignment of the channels in the ETS.
- **swapped:** This setting can be used to reverse the assignment of the illuminants in the ETS, for example in the event of an incorrect connection.
- **synchronous (channel B adopts settings from channel A):** If both connected illuminants are to be configured identically, only channel A is displayed and configured in the ETS. Channel B reacts identically to channel A. Therefore, no objects are displayed for channel B. Differentiation between the two channels takes place via the diagnostic object. If, for example, an illuminant is defective, the corresponding message is displayed via the diagnosis text.

Global dimming speeds

The settings made here refer to all activated channels.

A so-called “soft start” is implemented with the **switch-on speed**. The illuminant is gently dimmed up to the set brightness value in the configured time from the moment it is switched on.

The reverse is true for the **switch-off speed**. This means that the illuminant is dimmed down gently in a configured time.

The **dimming speed** specifies how long a dimming process takes. This means the time for dimming from 0 % to 100 % or from 100 % to 0 %. The time is shortened accordingly for values in between. For example, if the currently set value is changed by 50 %, the configured time is halved.

5.2 Basic settings

The following chapters describe the menus in the respective channel A or channel B.

5.2.1 Channel/Object description

A text field for free labelling is available for each channel:

Channel/Object description	Light - Kitchen
----------------------------	-----------------

Figure 5: Text field - Channel/Object description

A text of up to 30 characters can be stored for the field.

The text entered in “**Channel/Object description**” appears both in the menu behind the channel and in the channel’s communication objects:

General settings	0	Channel A: Light - Kitchen	Switch
+ Channel A: Light - Kitchen	2	Channel A: Light - Kitchen	Dimming relative
	3	Channel A: Light - Kitchen	Dimming absolute

Figure 6: Channel/Object description

5.2.2 Staircase light

When the “Staircase light” parameter is activated, some specific settings are displayed.
The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Staircase light	<ul style="list-style-type: none"> ■ not active ■ active 	Activation of the staircase light function.
Switch-on delay	<p style="text-align: center;">not active 1 s – 240 min</p>	Setting the time by which the switch-on process is to be delayed.
Staircase light timer	<p style="text-align: center;">0 ... 14400 s [90 s]</p>	Duration of the switch-on process.
Prewarning	<ul style="list-style-type: none"> ■ not active ■ active 	Activation of the prewarning function.
Prewarning duration	<p style="text-align: center;">0 ... 14400 s [10 s]</p>	Setting for how long the pre-warning should last. Only if “Prewarning” is active.
Dimming value	<p style="text-align: center;">0,5 – 100 % [20 %]</p>	Value to be dimmed to after the staircase lighting time has elapsed. Only if “Prewarning” is active.
Extend staircase light timer	<ul style="list-style-type: none"> ■ not active ■ restart time ■ add up time 	Activation of a possible extension of the staircase light time. Only with “Switch-on delay” is “not active”.
Manual switch-off	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the staircase light time can be ended before it expires.

Table 10: Settings – Staircase light

Switch-on delay

When activated, the channel switches on by the set time after receiving a logical “1”. This starts the staircase light time.

Staircase light timer

Specifies how long the channel should remain switched on after an “ON” telegram. After the staircase light time has elapsed, the channel switches off automatically.

Prewarning

The prewarning can be used to generate a change in brightness after the end of the staircase light time to an adjustable dimming value. This serves as an indication that the lighting will switch-off completely after a set prewarning time has elapsed.

Extend staircase light timer

Note: The parameter is only available if “Switch-on delay - not active” is set.

This setting can be used to extend the actual staircase lighting time in various ways. The following options are available:

- **not active**
Staircase light timer cannot be extended and can only be restarted after the staircase light time has elapsed.
- **restart time**
The staircase light timer is restarted by resending a logical “1” to the “Staircase light” object.
- **add up time**
The staircase light timer is added to the remaining staircase light time by resending a logical “1” to the “Staircase light” object.

Manual switch-off

If this function is active, the channel can be switched off before the set staircase light time has elapsed with a “0” on the “Staircase light” object.

Important: The total sequence time = switch-on delay + staircase lighting time + prewarning duration

The following illustration shows the exemplary sequence of the staircase light function:

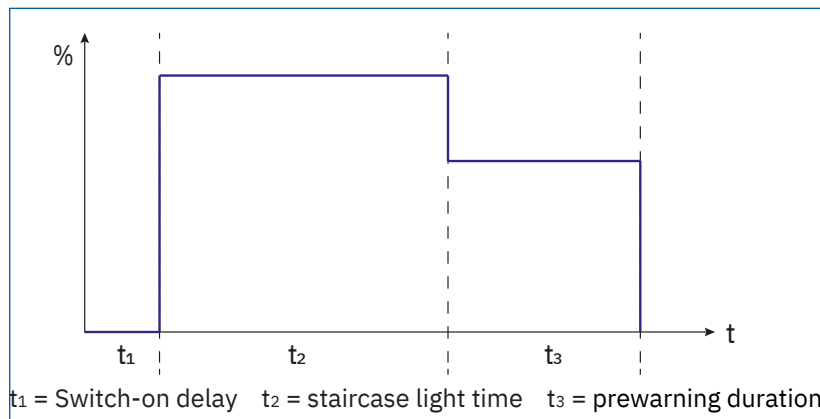


Figure 7: Sequence diagram – Staircase light

Note: The staircase light function has no influence on relative or absolute dimming.

The following table shows the associated communication object:

Number	Name / Object function	Length	Usage
1	Channel A: – Staircase light	1 Bit	Triggering the staircase light time

Table 11: Communication object – Staircase light

5.2.3 Switch-on/switch-off delay

The following table shows all available settings:

ETS Text	Dynamic range [Default value]	Comment
Switch-on delay	not active 1 s – 240 min	Setting the time by which the switch-on process is to be delayed.
Switch-off delay	not active 1 s – 240 min	Setting the time by which the switch-off process is to be delayed. Only available if “Staircase light” is not active.

Table 12: Settings – Switch-on/Switch-off delay

This function can be used to delay the switching telegrams. This means that the channel switches on or off by the set time after receiving a telegram.

The following diagram shows how the two functions work, both of which have been activated in this example:

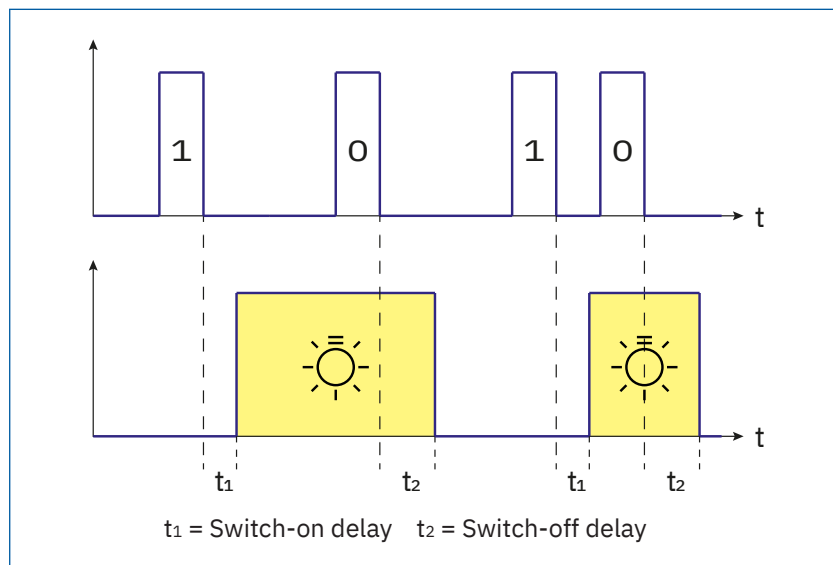


Figure 8: Function diagram – Switch-on/Switch-off delay

5.2.4 Switch-on behaviour

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Settings if “Day/Night” object in the “General settings” menu is “not active”		
Switch-on behaviour	<ul style="list-style-type: none"> ■ settable switch-on value ■ last brightness value (Memory) ■ start time-dependent dimming 	Setting how the channel should behave when switched on.
Switch-on value	0,5 – 100 % [100 %]	Value to be dimmed when switched on. Only with “settable switch-on value”
Settings if “Day/Night” object in the “General settings” menu is “active”		
Switch-on behaviour „Day“	<ul style="list-style-type: none"> ■ settable switch-on value ■ last brightness value (Memory) ■ start time-dependent dimming 	Setting how the channel should behave when switched on in day mode.
Switch-on value „Day“	0,5 – 100 % [100 %]	Value that should be dimmed when switching on in day mode. Only with “settable switch-on value”.
Switch-on behaviour „Night“	<ul style="list-style-type: none"> ■ settable switch-on value ■ last brightness value (Memory) ■ start time-dependent dimming ■ like „Day“ 	Setting how the channel should behave when switched on in night mode.
Switch-on value „Night“	like „Day“ 0,5 – 100 %	Value that should be dimmed when switching on in night mode. Only with “settable switch-on value”.
Extended switch-on behaviour	<ul style="list-style-type: none"> ■ not active ■ active 	Activation of further parameters for setting the switch-on behaviour.
Settings if “Day/Night” object in the “General settings” menu is “not active”		
Renewed switch-on	<ul style="list-style-type: none"> ■ settable switch-on value ■ last brightness value (Memory) ■ start time-dependent dimming 	Setting how the channel should behave when it is switched on again.
Switch-on value	0,5 – 100 % [100 %]	Brightness value to be dimmed when switching on again. Only with “settable switch-on value”.
Transfer brightness value to memory when „OFF“	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the last value should be saved when switching off. Only with „last brightness value (Memory)”.

ETS Text	Dynamic range [Default value]	Comment
Settings if “Day/Night” object in the “General settings” menu is “active”		
Renewed switch-on „Day“	<ul style="list-style-type: none"> ■ settable switch-on value ■ last brightness value (Memory) ■ start time-dependent dimming 	Setting how the channel should behave when switched on again in day mode.
Switch-on value „Day“	0,5 – 100 % [100 %]	Brightness value to be dimmed when switching on again in day mode. Only with “settable switch-on value”.
Renewed switch-on „Night“	<ul style="list-style-type: none"> ■ settable switch-on value ■ last brightness value (Memory) ■ start time-dependent dimming ■ like „Day“ 	Setting how the channel should behave when switched on again in night mode.
Switch-on value „Night“	like „Day“ 0,5 – 100 %	Brightness value to be dimmed when switching on again in night mode. Only with “settable switch-on value”.
Transfer brightness value to memory when „OFF“	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the last value should be saved when switching off. Displayed as soon as at least one switch-on behaviour is set to “last brightness value (memory)”.

Table 13: Settings – Switch-on behaviour

Switch-on behaviour „Day“/“Night“

Note: If the “Day/Night” object is not active, the “Day”/“Night” ending is omitted.

There are 3 different behaviours to choose from:

- **settable switch-on value**
A fixed switch-on value “Day”/“Night” is assigned to the channel. If the dimming range is limited (see Minimum/Maximum brightness “Day”/“Night”), the channel switches on with at least the minimum brightness value and at most the maximum brightness value, regardless of the set switch-on value.
- **last brightness value (Memory)**
The channel saves the last value reached before switching off and recalls it when switching on again.
- **start time-dependent dimming**
When switching on, the system starts with the settings in the “Time-dependent dimming” menu.
- **like „Day“** (Only with switch-on behaviour “Night”)
Adopts the “Day” switch-on behaviour settings.

Extended switch-on behaviour

By activating this parameter, it is possible to call up a new action by renewed switching on (in day and night mode). This overrides the switch-on behaviour.

The same options are available as for “Switch-on behaviour “Day”/”Night””.

Example:

Switch-on behaviour „Day“: Time-dependent dimming

Renewed switch-on „Day“: settable switch-on value Switch-on value „Day“: 100 %

Time-dependent dimming” is started with the first “ON”. If another “ON” is sent during the process, time-dependent dimming is stopped and the brightness is dimmed to 100 %.

Transfer brightness value to memory when „OFF“

The parameter is only displayed as soon as at least one switch-on behaviour is set to “last brightness value (memory)”.

Activation specifies that the last value is to be saved when switch-off.

5.2.5 Dimming speed

The dimming speeds can be adopted from the global settings in the “General settings” menu or can be set individually for each channel.

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Dimming speeds	<ul style="list-style-type: none"> ■ individual ■ global settings 	Setting whether the channel should adopt the global dimming speeds or whether individual times should be set for this channel.
The following parameters are available with the “individual” setting		
Switch-on speed „Day“ / „Night“	0 ... 14400 s [2 s]	Setting the time for a “soft start” of the illuminant in “Day” or “Night” mode.
Switch-off speed „Day“ / „Night“	0 ... 14400 s [2 s]	Setting the time for a “soft off” of the illuminant in “Day” or “Night” mode.
Switch-on speed	0 ... 14400 s [2 s]	Setting the time for a “soft start” of the illuminant. When „Day/Night“ is not active.
Switch-off speed	0 ... 14400 s [2 s]	Setting the time for a “soft off” of the illuminant. When „Day/Night“ is not active.
Speed „Dimming relative“	0 ... 120 s [10 s]	Setting the time for dimming from 0 % to 100 % or from 100 % to 0 % via relative dimming commands.
Speed „Dimming absolute“	0 ... 120 s [2 s]	Setting the time for dimming from 0 % to 100 % or from 100 % to 0 % via absolute dimming commands.

Table 14: Settings – Dimming speeds

A so-called “soft start” is implemented via the “**Switch-on speed**”. The illuminant is gently dimmed up to the set brightness value in the configured time from the moment it is switched on. The reverse is true for the “**Switch-off speed**”. This means that the illuminant is dimmed down gently in a configured time. The “**Dimming speed**” specifies how long a dimming process takes. This means the time for dimming from 0 % to 100 % or from 100 % to 0 %. The time is shortened accordingly for values in between. For example, if the currently set value is changed by 50 %, the configured time is halved.

5.2.6 Minimum/Maximum brightness

These parameters are used to define the dimming range for the corresponding channel.
The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Minimum brightness	0,5 – 100 % [0,5 %]	Minimum permissible brightness value. If “Day/Night” is not active.
Maximum brightness	0,5 – 100 % [100 %]	Maximum permissible brightness value. If “Day/Night” is not active.
Minimum brightness “Day”	0,5 – 100 % [0,5 %]	Minimum permissible brightness value in day mode.
Maximum brightness “Day”	0,5 – 100 % [100 %]	Maximum permissible brightness value in day mode.
Minimum brightness “Night”	0,5 – 100 % [0,5 %]	Minimum permissible brightness value in night mode.
Maximum brightness “Night”	0,5 – 100 % [100 %]	Maximum permissible brightness value in night mode.

Table 15: Settings – Minimum/Maximum brightness

If the technically possible dimming range (0.5 - 100 %) is to be limited, this is possible by setting a **minimum** and **maximum brightness value** for each channel individually. If the dimming range is limited, the illuminant can only be controlled within the set limits. It is no longer possible to exceed or fall below this value.

Setting the dimming range is particularly useful if certain values cannot or should not be achieved for technical reasons.

Example:

Minimum brightness value = 25 %, maximum brightness value = 85 %, Switch-on value = 100 %

- Telegram value: „ON“ --> controlled brightness value: 85 %
- Telegram value: „50 %“ --> controlled brightness value: 50 %
- Telegram value: „95 %“ --> controlled brightness value: 85 %
- Telegram value: „15 %“ --> controlled brightness value: 25 %
- Telegram value: „OFF“ --> controlled brightness value: 0 % (OFF)

5.2.7 Switch-off via “Dimming relative”

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Switch-off via “Dimming relative”	<ul style="list-style-type: none">■ not active■ active	Setting whether the channel can be switched off completely via relative dimming.

Table 16: Settings – Switch-off via “Dimming relative”

By activating the parameter, it is possible to control the channel via “Dimming relative” down to 0 % and thus switch it off. If this parameter is set to “not active”, the channel only dims to the set minimum value and therefore remains switched on.

5.2.8 Status output

Various parameters and objects are available for the status output.

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Send "Status dimming value"	<ul style="list-style-type: none"> ■ at dimming end ■ on change of 1 % ■ on change of 5 % ■ on change of 10 % ■ on change of 20 % 	Setting when the status of the current dimming value should be sent.
Send status objects cyclically	not active 1 min – 1 h	Setting whether and at what interval the status objects should be sent.
Send "Status dimming value" during active lock	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the "Status dimming value" should also be sent during a block.

Table 17: Settings – Status output

The "Status: Dimming value", "Status: On/Off" and "Status: Block" objects are permanently displayed.

Via "**Send status dimming value**", the current dimming value is sent in % according to the setting at the end of dimming or after a change by a certain value.

With "**Send status objects cyclically**", a fixed time can be defined in which these are sent cyclically to the bus. It is irrelevant whether the status or value of an object has changed.

The parameter "**Send status dimming value during active lock**" can be used to activate the status output even when the channel is locked in order to report the current value back to a visualisation unit, for example.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
4	Channel A: – Status: On/Off	1 Bit	Sending the current status
5	Channel A: – Status: Dimming value	1 Byte	Sending the current status
8	Channel A: – Status: Lock	1 Bit	Sending the current status

Table 18: Communication objects – Status objects

5.2.9 Behaviour after reset

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Behaviour after reset	<ul style="list-style-type: none"> ■ switch off ■ switch-on value „Day“/“Night“ ■ brightness value ■ last value ■ start time-dependent dimming 	Setting for how the channel should behave after a reset.
Brightness value	0,5 – 100 % [100 %]	Setting of an absolute value with which the channel starts. Only for behaviour „brightness value“.

Table 19: Settings – Behaviour after reset

- **switch off**
The channel is switched off after the reset (0 %).
- **switch-on value „Day“/“Night“**
The defined switch-on value for “Day” or “Night” is called up.
- **brightness value**
A fixed value is dimmed. This is defined with the “Brightness value” parameter.
- **last value**
The value that was active before the reset is restored.
- **start time-dependent dimming**
The device starts with the setting defined in the “Time-dependent dimming” menu.

5.2.10 Central objects

You can specify for each channel whether it should react to different central objects.
The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Central objects	<ul style="list-style-type: none"> ■ not active ■ active 	Activation/deactivation of the central objects.
Switch OFF	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the corresponding channel can be switched off via the central object.
Switch ON	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the corresponding channel can be switched on via the central object.
Dimming relative	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the corresponding channel can be dimmed relatively via the central object.
Dimming absolute	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the corresponding channel can be dimmed absolutely via the central object.
Scenes	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the corresponding channel should react to the central scene object.

Table 20: Settings – Central objects

If the function is activated for a channel, this channel reacts to the central objects. The specific central functions to which the channel should react can then be individually set there.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
68	Central – Switch	1 Bit	Central switch object for ON and OFF
69	Central – Dimming relative	4 Bit	Dims all channels with activated central function via relative values
70	Central – Dimming absolute	1 Byte	Dims all channels with activated central function via absolute values
71	Central – Scene	1 Byte	Scene recall for all channels with activated central function

Table 21: Communication objects – Central objects

5.2.11 Lock and Force functions

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Lock object 1/2 – Data point type	<ul style="list-style-type: none"> ■ not active ■ 1 Bit DPT 1.001 Switch ■ 2 Bit DPT 2.001 Switch control ■ 1 Byte DPT 5.001 Percent (0...100 %) 	Activation and selection of the data point type for the lock object.
Lock object – 1 Bit (specific settings)		
Action on value = 1	<ul style="list-style-type: none"> ■ lock ■ unlock/release 	Setting the action on receipt of a “1” on the lock object.
Action on value = 0	<p style="text-align: center;">Is set automatically. Always opposite action of “Action on value = 1”</p>	Setting the action on receipt of a “0” on the lock object. Fixed, cannot be changed.
Lock object – 2 Bit (specific settings)		
Action on value „Force ON“	lock	Action on receipt of the value “Force ON” on the lock object. Fixed, cannot be changed.
Action on value „Force OFF“	<ul style="list-style-type: none"> ■ lock -> OFF ■ no change 	Action on receipt of the value “Force OFF” on the lock object.
Action on value „Force End“	unlock/release	Action on receipt of the value “Force End” on the lock object. Fixed, cannot be changed.
Lock object – 1 Byte (specific settings)		
Action on value = 0 %	unlock/release	Action on receipt of the value 0 %. Fixed, cannot be changed.
Action on value unequal 0 %	lock -> dimming value = object value	Action on receipt of a value greater than 0 %. Fixed, cannot be changed.

ETS Text	Dynamic range [Default value]	Comment
Generally valid parameters (exceptions, see comment)		
Action on locking	<ul style="list-style-type: none"> ■ switch off ■ switch-on value „Day“/“Night“ ■ hold value / no change ■ brightness value ■ start sequence 1 ■ start sequence 2 ■ start time-dependent dimming ■ stop time-dependent dimming / sequence 	<p>Setting the action to be performed after a lock has been set.</p> <p>Only available with Lock objects „1 Bit“ and „2 Bit“.</p>
Brightness value	0 – 100 % [100 %]	Definition of an absolute value. Only if “brightness value” is selected.
Action on unlocking	<ul style="list-style-type: none"> ■ switch off ■ switch-on value „Day“/“Night“ ■ hold value / no change ■ brightness value ■ update value ■ value before lock ■ start sequence 1 ■ start sequence 2 ■ start time-dependent dimming ■ stop time-dependent dimming / sequence 	Setting the action to be performed after a lock is cancelled.
Brightness value	0 – 100 % [10 %]	Definition of an absolute value. Only if “brightness value” is selected.
Dimming speed	0 ... 120 s [2]	Setting the time in which the called brightness value is to be dimmed. Only available if “brightness value” is set for an action.
Fallback time for lock (0 = not active)	0 ... 32000 s [0]	Setting whether and at what time the locking function should be automatically reset.
Priority of lock	<ul style="list-style-type: none"> ■ not active ■ Lock 1 before Lock 2 	Activation of a priority for the two lock objects.

Table 22: Settings – Lock and Force functions

Lock objects 1 and 2 can be triggered via different data point types. The respective behaviour is as follows:

- **1 Bit object**

This determines whether the channel is to be locked or unlocked with a “0” or a “1”.

- **2 Bit object**

With the 2 Bit forced guidance, the channel is locked with the object value “Force ON” (1/1). The channel is unlocked with the object value “Force End” (0/0). These settings are fixed and cannot be changed.

The object value “Force OFF” (1/0) can be used to set whether a lock is set for the channel and simultaneously switched off or whether the channel remains in the current state (“no change”).

- **1 Byte object**

When any dimming value greater than 0 % is received, the channel is locked and simultaneously set to the received value. When the value “0 %” is received, the channel is unlocked again.

As soon as a channel is locked or unlocked, you can set how it should behave.

Important: When locking via a 1 Byte object, no action can be defined as the channel is always set to the received value here.

- **switch off**

The channel is switched off.

- **switch-on value „Day“/“Night“**

The channel calls up the configured switch-on value (corresponding to “Day” or “Night” mode).

- **hold value / no change**

The channel remains at the current value.

- **brightness value**

A freely adjustable brightness value is controlled.

- **update value** (*only for “Action on unlocking”*)

The value of the channel is updated to the last value received during the locking.

- **value before locking** (*only for “Action on unlocking”*)

The channel restores the value that was valid before it was locked.

- **start sequence 1/2**

The channel starts the corresponding sequence.

- **start time-dependent dimming**

The channel starts time-dependent dimming.

- **stop time-dependent dimming / sequence**

The channel stops the time-dependent dimming or the sequence in the current state.

Priority of lock

If “not active” is selected, the following applies: “Unlock” of lock 1 or 2 unlocks both locks. If “Lock 1 before lock 2” is selected, the following applies: If both locks are set, the action of lock 1 is executed.

Dimming speed

The parameter is only displayed if an action (on locking or unlocking) is set to “brightness value”. The speed therefore only relates to this brightness value.

Fallback time lock

The fallback time defines the time after which a set lock is cancelled. Once the set time has elapsed, the “Action on unlocking” applies. With the setting “0 s”, the fallback time is not active.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
6	Channel A: – Lock 1		Lock object 1 for the channel. DPT depending on parameter setting
7	Channel A: – Lock 2		Lock object 2 for the channel. DPT depending on parameter setting
8	Channel A: – Status: Lock	1 Bit	Sending a “1” when the channel is locked and a “0” when the channel is unlocked

Table 23: Communication objects – Lock and Force functions

5.2.12 Scenes

The “Scenes” menu is displayed when the “Scenes” parameter in the “Basic settings” menu of the corresponding channel is activated.

With a scene, it is possible to execute several actions in different trades (e.g. light, heating, roller shutters) simultaneously with one key press or one operating command. All this happens with one telegram. The channels can be integrated into a scene control system using the scene function. To do this, the corresponding scene (A ... H) must be assigned a scene number (1 ... 64) and an action.

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Save scene	<ul style="list-style-type: none"> ■ not active ■ active ■ keep learned scene (do not maintain parameter settings) 	Learning scenes. Activate/deactivate the memory function.
Scene number A – H	not active 1 – 64	Setting the scene number to which the channel should respond.
Action	<ul style="list-style-type: none"> ■ switch off ■ switch-on value „Day“/“Night“ ■ brightness value ■ brightness value when “OFF” new switch-on value (Memory) ■ start sequence 1 ■ start sequence 2 ■ start time-dependent dimming ■ stop time-dependent dimming / sequence ■ activate lock 1 ■ activate lock 2 ■ unlock 	Definition of the action to be performed when the scene is triggered.
Brightness value	0 – 100 % [100 %]	Definition of an absolute value. Only for action with “brightness value”.
Dimming speed	0 ... 14400 s [2]	Setting the time in which the called brightness value is to be dimmed. Only for action with “brightness value”.

Table 24: Settings – Scenes

If the **“Save scene”** parameter is activated, a scene value can be changed and saved after the scene is called up. To do this, the triggering button must also be set to **“save => active”**. If the button is now pressed and held, the corresponding value is sent to the bus for saving (see table on next page). The new value is then saved and will be executed the next time the scene is called up.

The parameter **„keep learned scene (do not maintain parameter settings)“** ensures that a learnt scene is retained even after reprogramming.

Note: Only applies to actions in which fixed values are defined.

The following actions can be performed when a scene is called up:

- **switch off**
The channel is switched off.
- **switch-on value „Day“/“Night“**
The channel calls up the configured switch-on value (corresponding to “Day” or “Night” mode).
- **brightness value**
A freely adjustable brightness value is controlled. In addition, the dimming speed can be used to define a time in which this value should be dimmed.
- **brightness value when “OFF” new switch-on value (Memory)**
The channel calls up a freely adjustable brightness value and adopts this for the next switch-on if the channel is off and the switch-on behaviour for this channel is set to **“last brightness value (memory)”**. In addition, the dimming speed can be used to define a time in which the value is to be dimmed.
- **start sequence 1/2**
The channel starts the corresponding sequence.
- **start time-dependent dimming**
The channel starts time-dependent dimming.
- **stop time-dependent dimming / sequence**
The channel stops the time-dependent dimming or the sequence.
- **activate lock 1**
Lock 1 is activated.
- **activate lock 2**
Lock 1 is activated.
- **unlock**
The channel is unlocked.

Note: A KNX scene is transmitted using a 1 Byte group address. Scene 1 corresponds to the transmitted decimal value “0” or the hex value “00” when it is called up. While the decimal value “128” or the hex value “80” is transmitted to save scene 1. The following table illustrates the relationship between the scene number and the transmitted value and helps with diagnostics via the ETS group monitor.

Scene No.	Call		Save	
	Decimal	Hexadecimal	Decimal	Hexadecimal
1	0	0x00	128	0x80
2	1	0x01	129	0x81
3	2	0x02	130	0x82
...
64	63	0x3f	191	0xBF

Table 25: Codes for calling and saving of scenes

The following table shows the associated communication object:

Number	Name / Object function	Length	Usage
9	Channel A: – Scene	1 Byte	Call up/saving of scenes

Table 26: Communication object – Scene

5.2.13 Bit Scenes

The “Bit Scenes” menu is displayed when the “Bit scenes” parameter in the “Basic settings” menu is activated.

The functionality of the bit scenes is similar to the normal scene function, except that an action can be called up for both the value “1” and the value “0”.

A text field for free labelling is available for each bit scene:

Object description	Lighting TV
--------------------	-------------

Figure 9: Text field – Object description

A text of up to 30 characters can be stored for the field. The text entered appears in the channel’s communication objects:

12	Channel A Bit Scene1: Lighting TV	Start
----	-----------------------------------	-------

Figure 10: Bit scenes-- Object description

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Bit Scene 1 – 4	<ul style="list-style-type: none"> ■ not active ■ active 	Activate/deactivate a bit scene.
Action on value = 1 / 0	<ul style="list-style-type: none"> ■ switch off ■ switch-on value „Day“/“Night“ ■ hold value / no change ■ brightness value ■ brightness value when “OFF” ■ new switch-on value (Memory) ■ start sequence 1 ■ start sequence 2 ■ start time-dependent dimming ■ stop time-dependent dimming / sequence ■ activate lock 1 ■ activate lock 2 ■ unlock 	Definition of the action to be performed when the Bit Scene is triggered.
Brightness value	0 – 100 % [100 %]	Definition of an absolute value. Only for action with “brightness value”.
Dimming speed	0 ... 14400 s [2]	Setting the time in which the called brightness value is to be dimmed. Only for action with “brightness value”.

Table 27: Settings – Bit Scenes

The following actions can be carried out with the values “1” and “0”:

- **switch off**
The channel is switched off.
- **switch-on value „Day“/“Night“**
The channel calls up the configured switch-on value (corresponding to “Day” or “Night” mode).
- **hold value / no change**
The channel remains at the current value.
- **brightness value**
A freely adjustable brightness value is controlled. In addition, the dimming speed can be used to define a time in which this value should be dimmed.
- **brightness value when “OFF” new switch-on value (Memory)**
The channel calls up a freely adjustable brightness value and adopts this for the next switch-on if the channel is off and the switch-on behaviour for this channel is set to “last brightness value (memory)”. In addition, the dimming speed can be used to define a time in which the value is to be dimmed.
- **start sequence 1/2**
The channel starts the corresponding sequence.
- **start time-dependent dimming**
The channel starts time-dependent dimming.
- **stop time-dependent dimming / sequence**
The channel stops the time-dependent dimming or the sequence.
- **activate lock 1**
Lock 1 is activated.
- **activate lock 2**
Lock 1 is activated.
- **unlock**
The channel is unlocked.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
12	Channel A Bit Scene 1: – Start	1 Bit	Calling up bit scene 1
13	Channel A Bit Scene 2: – Start	1 Bit	Calling up bit scene 2
14	Channel A Bit Scene 3: – Start	1 Bit	Calling up bit scene 3
15	Channel A Bit Scene 4: – Start	1 Bit	Calling up bit scene 4

Table 28: Communication objects – Bit Scenes

5.2.14 Sequences

The menus for “Sequence 1” and “Sequence 2” are displayed when the “Sequence 1” and “Sequence 2” parameters are activated in the “Basic settings” menu. The two sequences can then be configured individually in the respective menu.

A text field for free labelling is available for each sequence:

Function/Object description	Evening mood
-----------------------------	--------------

Figure 11: Text field - Function/Object description

A text of up to 30 characters can be stored for the field.

The text entered in “**Function/Object description**” appears both in the menu behind the channel and in the channel’s communication objects:

Sequence 1: Evening mood	52	Channel A Sequence 1: Evening mood	Start/Stop
	53	Channel A Sequence 1: Evening mood	Status

Figure 12: Sequence – Function/Object description

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
General settings		
Output “Status dimming value” during sequence	<ul style="list-style-type: none"> <input type="checkbox"/> not active <input checked="" type="checkbox"/> active 	Setting whether the brightness status should be sent during the sequence.
Action on brightness change via “Dimming absolute/relative”	Sequence is stopped	Sequence is stopped if a change is made during the run. Fixed setting, cannot be changed.
Fallback to sequence after brightness change	<ul style="list-style-type: none"> <input type="checkbox"/> not active <input checked="" type="checkbox"/> active 	Activation of a fallback time when the sequence starts again if it was previously stopped by dimming.
Fallback time	00:00:00 hh:mm:ss [00:01:00]	Definition of the fallback time in hours/minutes/seconds.
Behaviour with “OFF”	<ul style="list-style-type: none"> <input type="checkbox"/> stop sequence <input checked="" type="checkbox"/> switch off 	Setting for how the sequence should respond to an OFF telegram.
Send object „Sequence 1 - Status“	<ul style="list-style-type: none"> <input type="checkbox"/> not active <input checked="" type="checkbox"/> on change <input type="checkbox"/> on change and repeated restart 	Setting whether and when the status of the sequence should be sent.

ETS Text	Dynamic range [Default value]	Comment
Sequence settings		
Switch sequence with	<ul style="list-style-type: none"> ■ fixed values ■ random values 	Setting as to whether the brightness values for the individual steps should be permanently defined or whether random values should be generated.
Transition time: Random	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the time between two steps should be random. When selecting with “random values”.
Endless loop	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the sequence should be repeated endlessly in a loop.
Number of cycles	1 ... 255 [1]	Setting for how often the sequence should be repeated. Only with „Endless loop - not active“.
Behaviour after sequence	<ul style="list-style-type: none"> ■ switch off ■ hold values ■ start sequence 1 ■ start sequence 2 ■ start time-dependent dimming ■ state before sequence 	Setting how the channel should behave after the end of the sequence. „state before sequence“ only with „Endless loop - not active“.
Number of steps	1 – 5 [5]	Setting for how many steps the sequence is divided into.
Definition of step 1 - 5		
Brightness	0 – 100 % [100 %]	Definition of the brightness for the step. When selecting with “fixed values”.
Brightness randomly from ...	0 – 100 % [0 %]	Definition of the lower limit value. When selecting with “random values”.
Brightness randomly to ...	0 – 100 % [100 %]	Definition of the upper limit value. When selecting with “random values”.
Hold time	0 ... 65535 x 100 ms [50]	Setting for how long the step should be executed.
Transition time to the next step	0 ... 65535 s [10]	Definition of the time from one step to the next.
Random time to the next step	0 ... 65535 s [10]	Setting the maximum random time from one step to the next. Only selection with “Random values” and “Transition time random - active”.

Table 29: Settings – Sequences

The parameter “**Output “Status dimming value” during sequence**” activates the status output (in %) on the object “Status: Dimming value” while a sequence is running.

Important: Sending conditions are defined in the menu „Basic settings“ under „Status output“.

If the “**Fallback to sequence after brightness change**” parameter is activated, a time can be defined after which the sequence is restarted if it was previously stopped by a dimming command (relative or absolute).

The “**Behaviour with “OFF”**” parameter defines whether the light source is switched off completely when the sequence is switched off or whether only the sequence should be stopped.

The sending behaviour of the status object is defined via “**Send object “Sequence 1 - Status”**”. The setting “on change” specifies that the status is sent every time there is a change. The setting “on change and repeated restart” causes the status to be sent after every change and also after every run of the sequence.

Switch sequence with

If the sequence is controlled with fixed values, a fixed brightness value is defined for each step in the sequence, which is to be called up for the corresponding step. If the sequence is controlled with random values, the values are generated randomly by the device. A minimum and a maximum brightness value are defined for each step. A brightness value for the step is dimmed within these limits.

If the “**Transition time: random**” parameter is “**not active**”, the transition time for each step is set to a fixed value.

If “**Transition time: random**” is “**active**”, the “Transition time up to next step” parameter changes to “**Random time to next step**” for each step.

Important: The random time is a value between “0 s” and the defined value!

Endless loop

With the setting “Endless loop” - “active”, the sequence is run through up to when it is stopped via the communication object for this sequence or via “Dimming absolute/relative”. The other parameters for setting the loop runs are omitted in this case.

If the “Endless loop” setting is “not active”, you can specify how often the sequence should be run through.

In addition, a behaviour can be defined after the end of the sequence:

- **switch off**
The channel is switched off.
- **hold value**
The channel remains at the current value.
- **start sequence 1/2**
The channel starts the corresponding sequence.
- **start time-dependent dimming**
The channel starts time-dependent dimming.
- **state before sequence** (*Only for selection with setting “Endless loop - not active”*).
The channel assumes the state it had before the start of the sequence.

Steps

A brightness value, a hold time and a transition time are defined for each step.

The **hold time** specifies how long a step should be executed or how long the sequence should remain in this state.

The **transition time/random time** defines the time in which dimming should take place from one step to the next.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
52	Channel A Sequence 1: – Start/Stop	1 Bit	Activating/stopping sequence 1
53	Channel A Sequence 1: – Status	1 Bit	Sending the status of sequence 1
54	Channel A Sequence 2: – Start/Stop	1 Bit	Activating/stopping sequence 2
55	Channel A Sequence 2: – Status	1 Bit	Sending the status of sequence 2

Table 30: Communication objects – Sequences

5.2.15 Time-dependent dimming

The “Time-dependent dimming” menu is displayed when the “Time-dependent dimming” parameter is activated in the “Basic settings” menu. Each channel can be dimmed automatically during the course of the day depending on the time or sunrise/sunset.

A text field for free labelling is available for “Time-dependent dimming”:

Function/Object description	Evening mood
-----------------------------	--------------

Figure 13: Text field - Function/Object description

A text of up to 30 characters can be stored for the field.

The text entered in “**Function/Object description**” appears both in the menu behind the channel and in the channel’s communication objects:

Time-dependent dimming: Evening mood		
56	Channel A Time-dependent dimming: Evening mood	Start/Stop
57	Channel A Time-dependent dimming: Evening mood	Status

Figure 14: Time-dependent dimming – Function/object description

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
General settings		
Output “Status dimming value” during time-dependent dimming	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the current brightness status should be sent during the process.
Switching times	<ul style="list-style-type: none"> ■ fixed times ■ sunrise/sunset 	Setting how the switching times are to be defined.
Action on brightness change via “Dimming absolute/relative”	time-dependent dimming is stopped	Time-dependent dimming is stopped if a change is made during the run. Fixed setting, cannot be changed.
Fallback to time-dependent dimming after brightness change	<ul style="list-style-type: none"> ■ not active ■ active 	Activation of a fallback time when time-dependent dimming starts again if it was previously stopped by dimming.
Fallback time	00:00:00 hh:mm:ss [00:01:00]	Definition of the fallback time in hours/minutes/seconds.

ETS Text	Dynamic range [Default value]	Comment
Behaviour with “OFF”	<ul style="list-style-type: none"> ■ stop time-dependent dimming ■ switch off 	Setting for how time-dependent dimming should respond to an OFF telegram.
Definition of steps 1 - 10		
Step 1 – 10: Time	00:00 ... 23:59 hh:mm	Definition of the time for the corresponding step. For “Switching times” - “Fixed times”.
Step 1 – 10: Time	<ul style="list-style-type: none"> ■ sunrise -5 h ■ sunrise -4 h ■ sunrise -3 h ■ : ■ sunset +4 h ■ sunset +5 h 	Definition of the time for the corresponding step. For “Switching times” - “Sunrise/sunset”.
Brightness	0 – 100%	Setting the brightness to be controlled for the respective step.

Table 31: Settings – Time-dependent dimming

With time-dependent dimming, a dimming process can be realised over an entire day. The brightness is tracked for the channel depending on the time. Time-dependent dimming can be realised either on the basis of sunrise and sunset times (which the LED controller calculates itself) or on the basis of fixed times. Up to 10 steps (time + brightness value to be controlled) can be defined for this purpose. The set brightness is then reached at the set time. The LED controller interpolates between the steps. This means, for example, for the setting “Brightness 50 %” for “8:00 am” and “Brightness 75 %” for “10:00 am”, that the channel dims slowly from 50 % to 75 % within these 2 hours.

The parameter “**Output “Status dimming value” during time-dependent dimming**” activates the status output (in %) on the object “Status: Dimming value” while a sequence is running.

Important: Sending conditions are defined in the menu „Basic settings“ under „Status output“.

The switching times can be set either via fixed times (selection in the range from “00:00 to 23:59”) or depending on sunrise/sunset (selection in the range from “Sunrise -5 h / 5 h” and “Sunset -5 h / +5 h”).

Important: For internal calculation, a current time and date must be sent to the LED controller via the corresponding objects.

If the “**Fallback to time-dependent dimming after brightness change**” parameter is activated, a time can be defined after which time-dependent dimming is restarted if it was previously stopped by a dimming command (relative or absolute).

The “**Behaviour with “OFF”**” parameter defines whether the light is switched off completely when time-dependent dimming is switched off or whether only time-dependent dimming is stopped.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
56	Channel A Time-dependent dimming: – Start/Stop	1 Bit	Activating/stopping time-dependent dimming
57	Channel A Time-dependent dimming: – Status	1 Bit	Sending the current status

Table 32: Communication objects – Time-dependent dimming

6 Function selection – Tunable White

Note: The function selection is made in the “General settings” menu. Depending on the selection, in addition to the settings - see chapter [4.1 General Settings](#) – further specific parameters are displayed, which are described in the following chapter.

6.1 Specific settings

The following table shows the specific settings available for the function selection “Tunable White” in the “General settings” menu:

ETS Text	Dynamic range [Default value]	Comment
Swap outputs	<ul style="list-style-type: none">■ not active■ active	Setting whether the outputs of the two channels should be swapped.
Wiring diagram	Presentation of a graphic	Graphic is displayed according to the “Swap outputs” selection.
Limit outputs A + B to 100 % (illuminant protection)	<ul style="list-style-type: none">■ not active■ active	Activation of a limitation of the outputs in order not to overload lamps.

Table 33: General settings – Tunable White

Swap outputs

By default, the “Cold white” connection of the TW light source is connected to channel A of the controller. In the event of an incorrect connection, the inputs can be reversed by activating the “Swap outputs” parameter. The assignment is shown by a graphic in the “Wiring diagram” parameter below.

Activation of the parameter “**Limit outputs A + B to 100 % (illuminant protection)**” causes the output power to be limited. This prevents the illuminant from being overloaded.

Note: This setting has first priority and may override other settings, for example “Brightness via different colour temperatures” in the “TW settings” menu.

6.2 Basic settings

6.2.1 Channel/Object description

A text field for free labelling is available for the TW channel:

Channel/Object description	Light - Kitchen
----------------------------	-----------------

Figure 15: Text field - Channel/Object description

A text of up to 30 characters can be stored for the field.

The text entered in “**Channel/Object description**” appears both in the menu behind the channel and in the channel’s communication objects:

General settings	↔ 32	TW: Light - Kitchen	Switch
	↔ 36	TW Brightness: Light - Kitchen	Dimming absolute
+ Tunable White (TW): Light - Kitchen	↔ 39	TW Brightness: Light - Kitchen	Dimming relative

Figure 16: Channel/Object description

6.2.2 Staircase light

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Staircase light	<ul style="list-style-type: none"> ■ not active ■ active 	Activation of the staircase light function.
Staircase light timer	0 ... 14400 s [90 s]	Duration of the switch-on process.
Extend staircase light timer	<ul style="list-style-type: none"> ■ not active ■ restart time ■ add up time 	Activation of a possible extension of the staircase light time.
Manual switch-off	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the staircase light time can be ended before it expires.

Table 34: Settings – Staircase light

Staircase light timer

Specifies how long the channel should remain switched on after an “On” telegram. After the staircase light time has elapsed, the channel switches off automatically..

Extend staircase light timer

This setting can be used to extend the actual staircase lighting time in various ways. The following options are available:

- **not active**
Staircase light time cannot be extended and can only be restarted after the staircase light time has elapsed.
- **restart time**
The staircase light time is restarted by resending a logical “1” to the “Staircase light” object.
- **add up time**
The staircase light time is added to the remaining staircase light time by resending a logical “1” to the “Staircase light” object.

Manual switch-off

If this function is active, the channel can be switched off before the set staircase light time has elapsed with a “0” on the “Staircase light” object.

The following table shows the associated communication object:

Number	Name / Object function	Length	Usage
33	TW: – Staircase light	1 Bit	Triggering the staircase light time

Table 35: Communication object – Staircase light

6.2.3 Switch-on/Switch-off delay

Note: The two parameters for switch-on and switch-off delay are only available if the “Staircase light” function is not active!

The following table shows all available settings:

ETS Text	Dynamic range [Default value]	Comment
Switch-on delay	not active 1 s – 240 min	Setting the time by which the switch-on process is to be delayed.
Switch-off delay	not active 1 s – 240 min	Setting the time by which the switch-off process is to be delayed.

Table 36: Settings – Switch-on/Switch-off delay

This function can be used to delay the switching telegrams. This means that the channel switches on or off by the set time after receiving a telegram.

The following diagram shows how the two functions work, both of which have been activated in this example:

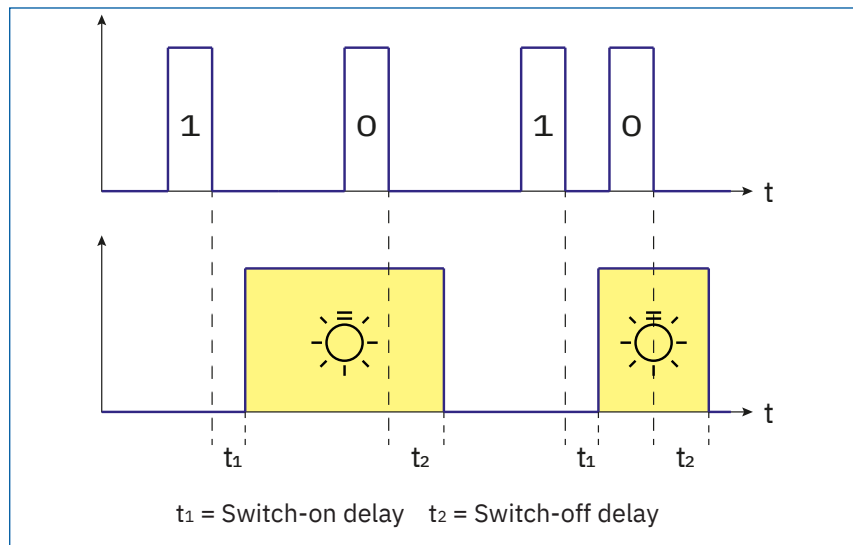


Figure 17: Function diagram – Switch-on/Switch-off delay

6.2.4 Switch-on behaviour

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Settings if “Day/Night” object in the “General settings” menu is “not active”		
Switch-on behaviour	<ul style="list-style-type: none"> ■ last value / sequence ■ fixed CW and WW values ■ fixed TW values and brightness ■ change brightness ■ start sequence 1 ■ start sequence 2 ■ start HCL 	Setting how the channel should behave when switched on.
Switch-on value: Cold White / Warm White	0 – 100 % [100 %]	Setting the values for CW and WW when switching on. Only for “fixed CW and WW values”.
Switch-on value: Colour temperature	<ul style="list-style-type: none"> ■ 0 % KW, 100 % WW (warm +++) ■ 5 % KW, 95 % WW (warm ++) ■ 10 % KW, 90 % WW (warm +) ■ : ■ 95 % KW, 5 % WW (cold ++) ■ 100 % KW, 0 % WW (cold +++) 	Setting the colour temperature value when switching on. Only for “fixed TW values and brightness”.
Switch-on value: Brightness	0 – 100 % [100 %]	Setting the brightness value when switching on. Only for “change brightness” and “fixed TW values and brightness”.
Switch-on speed	0 ... 14400 s [2]	Setting the time for a “soft start”.
Switch-off speed	0 ... 14400 s [2]	Setting the time for a “soft-off”.
Settings if “Day/Night” object in the “General settings” menu is “active”		
Switch-on behaviour „Day“	<ul style="list-style-type: none"> ■ last value / sequence ■ fixed CW and WW values ■ fixed TW values and brightness ■ change brightness ■ start sequence 1 ■ start sequence 2 ■ start HCL 	Setting for how the channel should behave when switched on in day mode.
Switch-on value: Cold White / Warm White „Day“	0 – 100 % [100 %]	Setting the values for CW and WW when switching on in day mode. Only for “fixed CW and WW values”.

ETS Text	Dynamic range [Default value]	Comment
Switch-on value: Colour temperature „Day“	<ul style="list-style-type: none"> ■ 0 % KW, 100 % WW (warm +++) ■ 5 % KW, 95 % WW (warm ++) ■ 10 % KW, 90 % WW (warm +) ■ : ■ 95 % KW, 5 % WW (cold ++) ■ 100 % KW, 0 % WW (cold +++) 	Definition of the colour temperature value when switching on in day mode. Only for “fixed TW values and brightness”.
Switch-on value: Brightness „Day“	0 – 100 % [100 %]	Definition of the brightness value when switching on in day mode. Only for “change brightness” and “fixed TW values and brightness”.
Switch-on speed „Day“	0 ... 14400 s [2]	Setting the time for a “soft start” in day mode.
Switch-off speed „Day“	0 ... 14400 s [2]	Setting the time for a “soft-off” in day mode.
Switch-on behaviour „Night“	<ul style="list-style-type: none"> ■ last value / sequence ■ fixed CW and WW values ■ fixed TW values and brightness ■ change brightness ■ start sequence 1 ■ start sequence 2 ■ start HCL 	Setting for how the channel should behave when switched on in night mode.
Switch-on value: Cold White / Warm White „Night“	0 – 100 % [100 %]	Setting the values for KW and WW when switching on in night mode. Only for “fixed CW and WW values”.
Switch-on value: Colour temperature „Night“	<ul style="list-style-type: none"> ■ 0 % KW, 100 % WW (warm +++) ■ 5 % KW, 95 % WW (warm ++) ■ 10 % KW, 90 % WW (warm +) ■ : ■ 95 % KW, 5 % WW (cold ++) ■ 100 % KW, 0 % WW (cold +++) 	Definition of the colour temperature value when switching on in night mode. Only for “fixed TW values and brightness”.
Switch-on value: Brightness „Night“	0 – 100 % [30 %]	Definition of the brightness value when switching on in night mode. Only for “change brightness” and “fixed TW values and brightness”.
Switch-on speed “Night”	0 ... 14400 s [2]	Setting the time for a “soft start” in night mode.
Switch-off speed “Night”	0 ... 14400 s [2]	Setting the time for a “soft-off” in night mode.

Table 37: Settings – Switch-on behaviour

Switch-on behaviour “Day”/”Night”

Note: If the “Day/Night” object is not active, the “Day”/”Night” ending is omitted.

Various behaviours are available for selection here:

- **last value / sequence**
The value before switching off is restored or the sequence that was active before switching off is started.
- **fixed CW and WW values**
Fixed values are dimmed for Cold White and Warm White.
- **fixed TW values and brightness**
Fixed values for the colour temperature and brightness are dimmed.
- **change brightness**
Only the brightness is changed, the colour temperature remains the same.
- **start sequence 1**
Sequence 1 is started.
- **start sequence 2**
Sequence 2 is started.
- **start HCL**
HCL is started

In addition, the switch-on and switch-off speeds are set for the respective action.

- **Switch-on speed**
A soft-start function is realised by the switch-on speed. The time only refers to “hard” switch-on, e.g. after a reset or via the “TW - Switch” object, but not to relative dimming from 0 %. With a switch-on time of 2 seconds, the TW LED is slowly dimmed to the set value within 2 seconds.
- **Switch-off speed**
A soft-stop function is realised with the switch-off speed. The time only refers to the “hard” switch-off, e.g. via object “TW - Switch”, but not to the relative dimming to 0 %. With a switch-off time of 2 s, the TW LED is dimmed to 0 % within 2 s.

6.2.5 Extended switch-on behaviour

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Extended switch-on behaviour	<ul style="list-style-type: none"> ■ not active ■ active 	Activation of further parameters for setting the switch-on behaviour.
Settings if “Day/Night” object in the “General settings” menu is “not active”		
Renewed switch-on	<ul style="list-style-type: none"> ■ last value / sequence ■ fixed CW and WW values ■ fixed TW values and brightness ■ change brightness ■ start sequence 1 ■ start sequence 2 ■ start HCL 	Setting how the channel should behave when it is switched on again.
Switch-on value: Cold White / Warm White	0 – 100 % [100 %]	Setting the values for CW and WW when switching on again. Only for “fixed CW and WW values”.
Switch-on value: Colour temperature	<ul style="list-style-type: none"> ■ 0 % KW, 100 % WW (warm +++) ■ 5 % KW, 95 % WW (warm ++) ■ 10 % KW, 90 % WW (warm +) ■ : ■ 95 % KW, 5 % WW (cold ++) ■ 100 % KW, 0 % WW (cold +++) 	Definition of the colour temperature value when switching on again. Only for “fixed TW values and brightness”.
Switch-on value: Brightness	0 – 100 % [100 %]	Definition of the brightness value when switching on again. Only for “change brightness” and “fixed TW values and brightness”.
Settings if “Day/Night” object in the “General settings” menu is “active”		
Renewed switch-on „Day“	<ul style="list-style-type: none"> ■ last value / sequence ■ fixed CW and WW values ■ fixed TW values and brightness ■ change brightness ■ start sequence 1 ■ start sequence 2 ■ start HCL 	Setting how the channel should behave when it is switched on again in day mode.
Switch-on value: Cold White / Warm White „Day“	0 – 100 % [100 %]	Setting the values for CW and WW when switching on again in day mode. Only for “fixed CW and WW values”.

ETS Text	Dynamic range [Default value]	Comment
Switch-on value: Colour temperature „Day“	<ul style="list-style-type: none"> ■ 0 % KW, 100 % WW (warm +++) ■ 5 % KW, 95 % WW (warm ++) ■ 10 % KW, 90 % WW (warm +) ■ : ■ 95 % KW, 5 % WW (cold ++) ■ 100 % KW, 0 % WW (cold +++) 	Definition of the colour temperature value when switching on again in day mode. Only for “fixed TW values and brightness”.
Switch-on value: Brightness „Day“	0 – 100 % [100 %]	Definition of the brightness value when switching on again in day mode. Only for “change brightness” and “fixed TW values and brightness”.
Renewed switch-on „Night“	<ul style="list-style-type: none"> ■ last value / sequence ■ fixed CW and WW values ■ fixed TW values and brightness ■ change brightness ■ start sequence 1 ■ start sequence 2 ■ start HCL 	Setting how the channel should behave when it is switched on again in night mode.
Switch-on value: Cold White / Warm White „Night“	0 – 100 % [100 %]	Setting the values for CW and WW when switching on again in day mode. Only for “fixed CW and WW values”.
Switch-on value: Colour temperature „Night“	<ul style="list-style-type: none"> ■ 0 % KW, 100 % WW (warm +++) ■ 5 % KW, 95 % WW (warm ++) ■ 10 % KW, 90 % WW (warm +) ■ : ■ 95 % KW, 5 % WW (cold ++) ■ 100 % KW, 0 % WW (cold +++) 	Definition of the colour temperature value when switching on again in day mode. Only for “fixed TW values and brightness”.
Switch-on value: Brightness „Night“	0 – 100 % [30 %]	Definition of the brightness value when switching on again in day mode. Only for “change brightness” and “fixed TW values and brightness”.

Table 38: Settings – Extended switch-on behaviour

By activating this parameter, it is possible to call up a new action by switching on again (in day and night mode). This overrides the switch-on behaviour.

Note: If the “Day/Night” object is not active, the “Day”/”Night” ending is omitted.

Various behaviours are available for selection here:

- **last value / sequence**
The value before switching off is restored or the sequence that was active before switching off is started.
- **fixed CW and WW values**
Fixed values are dimmed for Cold White and Warm White.
- **fixed TW values and brightness**
Fixed values for the colour temperature and brightness are dimmed.
- **change brightness**
Only the brightness is changed, the colour temperature remains the same.
- **start sequence 1**
Sequence 1 is started.
- **start sequence 2**
Sequence 2 is started.
- **start HCL**
HCL is started

Example:

Switch-on behaviour “Day”: start HCL
Renewed switch-on „Day“: fixed TW values and brightness
Switch-on value: Cold White „Day“: 50 %
Switch-on value: Warm White „Day“: 50 %

HCL” is started with the first “ON”. If a new “ON” is sent during the sequence, HCL is stopped and cold white and warm white are each dimmed to 50 %.

Note: This is a “toggle” function. The first “ON” executes the “Switch-on” action. Another “ON” executes the action for “renewed switch-on”. Another “ON” executes the first action and so on.

6.2.6 Single-channel control

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Single-channel control	<ul style="list-style-type: none"> ■ not active ■ active (not recommended) 	Setting whether the channels can be controlled individually.
Switch-on brightness channel A (Cold White)	0,5 – 100 % [100 %]	Setting for the brightness of CW.
Switch-on brightness channel B (Warm White)	0,5 – 100 % [100 %]	Setting for the brightness of WW.

Table 39: Settings – Single-channel control

When activated, it is possible to control the channels individually and thus override the TW settings.

Note: The function is not recommended and is only suitable for special applications. For example, there are visualisations that require the objects to control TW.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
0	TW Cold White: – Switch	1 Bit	Switch function On/Off for CW
2	TW Cold White: – Dimming relative	4 Bit	Dims the channel up and down evenly
3	TW Cold White: – Dimming absolute	1 Byte	Dims the channel to a fixed brightness value
4	TW Cold White: – Status: On/Off	1 Bit	Sending the current status
5	TW Cold White: – Status: Dimming value	1 Byte	Sending the current absolute brightness value
16	TW Warm White: – Switch	1 Bit	Switch function On/Off for WW
18	TW Warm White: – Dimming relative	4 Bit	Dims the channel up and down evenly
19	TW Warm White: – Dimming absolute	1 Byte	Dims the channel to a fixed brightness value
20	TW Warm White: – Status: On/Off	1 Bit	Sending the current status
21	TW Warm White: – Status: Dimming value	1 Byte	Sending the current absolute brightness value

Table 40: Communication objects – Single-channel control

6.2.7 Switch-off/on with “Dimming relative”

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Switch-off via „Dimming relative - Brightness“	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the channel can be switched off via a “Dimming relative” command.
Switch-on via „Dimming relative - Colour temperature“	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the channel can be switched on via a “Dimming relative” command.

Table 41: Settings – Switch-off/on via “Dimming relative”

By activating the parameters, it is possible to control the TW channel by dimming the relative brightness up to 0 % and thus switch it off. If this parameter is set to “not active”, the channel only dims up to the set minimum value and thus remains active.

On the other hand, it is possible to switch on the TW channel via relative dimming of the colour temperature. If the parameter is “not active”, the TW channel can only be switched on with a switch-on command or an absolute value.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
38	TW Colour temperature (proportion of CW in %) – Dimming relative	4 Bit	Dims the colour temperature up and down evenly
39	TW Brightness – Dimming relative	4 Bit	Dims the brightness up and down evenly

Table 42: Communication objects – Switch-off/on with “Dimming relative”

6.2.8 Dimming speeds

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Dimming relative: Brightness	1 ... 120 s [10]	Defines the time for relative dimming of the brightness.
Dimming relative: Colour temperature	1 ... 120 s [10]	Defines the time for relative dimming of the colour temperature.
Dimming absolute	1 ... 14400 s [2]	Defines the time for absolute dimming.

Table 43: Settings – Dimming speeds

The times for relative dimming refer to a relative dimming process from 0 % - 100 % and vice versa. With a configured time of 10 s, relative dimming from 0 % to 100% and vice versa would take 10 s. Relative dimming from 10 % to 60 %, for example, would take 5 s accordingly.

The time for absolute dimming also refers to a dimming process from 0 % to 100 % and vice versa. With a configured time of 10 s, an absolute change by 50 % would take 5 s.

6.2.9 Status output

Various parameters and objects are available for the status output.
The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Output "Single-channel" status	<ul style="list-style-type: none"> ■ not active ■ at dimming end ■ during dimming process and at dimming end 	Setting whether and when the status of the dimming value of the individual channels should be sent. Only available if "Single-channel control" is active.
Output „Tunable White“ status	<ul style="list-style-type: none"> ■ not active ■ at dimming end ■ during dimming process and at dimming end 	Setting whether and when the status for Tunable White should be sent.
Send on change of ...	<ul style="list-style-type: none"> ■ 2 % ■ 5 % ■ 10 % ■ 20 % 	Setting for which change the dimming status should be sent. Only available if "during dimming process and at dimming end" .

Table 44: Settings – Status output

The status for each of the two individual channels (CW and WW) as well as the status for TW can be output. The status is output either at the end of dimming, i.e. when a dimming process has been completed, or during the dimming process and at the end of dimming. For the output during the dimming process, a rate can be set from which change the status is to be sent.

Note: The status during the dimming process is sent a maximum of once per second.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
5	TW Cold White: – Status: Dimming value	1 Byte	Sending the current status
21	TW Warm White: – Status: Dimming value	1 Byte	Sending the current status
41	TW Colour temperature (proportion of CW in %) – Status: Dimming value	1 Byte	Sending the current status
42	TW Colour temperature (Kelvin) – Status: Dimming value	2 Byte	Sending the current status
43	TW Brightness: – Status: Dimming value	1 Byte	Sending the current status

Table 45: Communication objects – Status output

6.2.10 Minimum/Maximum Brightness

These parameters are used to define the dimming range for the corresponding channel.
The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Minimum brightness	0,5 – 100 % [0,5 %]	Minimum permissible brightness value. If “Day/Night” is not active.
Maximum brightness	0,5 – 100 % [100 %]	Maximum permissible brightness value. If “Day/Night” is not active.
Minimum brightness “Day”	0,5 – 100 % [0,5 %]	Minimum permissible brightness value in day mode.
Maximum brightness “Day”	0,5 – 100 % [100 %]	Maximum permissible brightness value in day mode.
Minimum brightness “Night”	0,5 – 100 % [0,5 %]	Minimum permissible brightness value in night mode.
Maximum brightness “Night”	0,5 – 100 % [100 %]	Maximum permissible brightness value in night mode.

Table 46: Settings – Minimum/Maximum brightness

If the technically possible dimming range (0.5 - 100 %) is to be limited, this is possible by setting a **minimum** and **maximum brightness value** for each channel individually. If the dimming range is limited, the illuminant can only be controlled within the set limits. It is no longer possible to exceed or fall below this value.

Setting the dimming range is particularly useful if certain values cannot or should not be achieved for technical reasons.

Example:

Minimum brightness value = 25 %, maximum brightness value = 85 %, Switch-on value = 100 %

- Telegram value: „ON“ --> controlled brightness value: 85 %
- Telegram value: „50 %“ --> controlled brightness value: 50 %
- Telegram value: „95 %“ --> controlled brightness value: 85 %
- Telegram value: „15 %“ --> controlled brightness value: 25 %
- Telegram value: „OFF“ --> controlled brightness value: 0 % (OFF)

6.2.11 Behaviour after reset

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Behaviour after reset	<ul style="list-style-type: none"> ■ switch off ■ switch-on value „Day“/“Night“ ■ last value / sequence ■ fixed CW and WW values ■ fixed TW values and brightness ■ start sequence 1 ■ start sequence 2 ■ start HCL 	Setting for how the channel should behave after a reset.
Value: Cold White / Warm White	0 – 100 % [100 %]	Setting the values for CW and WW after a reset. Only for “fixed CW and WW values”.
Value: Colour temperature	<ul style="list-style-type: none"> ■ 0 % KW, 100 % WW (warm +++) ■ 5 % KW, 95 % WW (warm ++) ■ 10 % KW, 90 % WW (warm +) ■ : ■ 95 % KW, 5 % WW (cold ++) ■ 100 % KW, 0 % WW (cold +++) 	Definition of the value for the colour temperature after a reset. Only for “fixed TW values and brightness”.
Value: Brightness	0 – 100 % [100 %]	Setting the brightness value after a reset. Only for “fixed TW values and brightness”..

Table 47: Settings – Behaviour after reset

- **switch off**
The channel is switched off after the reset (0 %).
- **switch-on value „Day“/“Night“**
The defined switch-on value for “Day” or “Night” is called up.
- **last value / sequence**
The value before switching off is restored or the sequence that was active before switching off is started.
- **fixed CW and WW values**
Fixed values are dimmed for Cold White and Warm White.
- **fixed TW values and brightness**
Fixed values for the colour temperature and brightness are dimmed.
- **start sequence 1/2**
Sequence 1 respectively Sequence 2 is started.
- **start HCL**
HCL is started

6.2.12 TW settings

6.2.12.1 Basic settings

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Colour temperature: Warm White	1000 ... 3300 Kelvin [2700]	Setting the colour temperature for Warm White.
Colour temperature: Cold White	4000 ... 8000 Kelvin [6000]	Setting the colour temperature for Cold White.
Brightness via different colour temperatures	<ul style="list-style-type: none"> ■ constant ■ maximum 	Setting for calculating the brightness for “100 %”.
Override 100 % brightness with “Dimming relative”	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the brightness can be overridden after reaching 100 %.

Table 48: Basic settings – Tunable White

The dimming range is defined with the settings “**Colour temperature: Warm White/Cold White**”. The colour temperature can only be changed within these values.

The “**Brightness via different colour temperatures**” parameter defines the behaviour of the brightness when the colour temperature is changed. The following settings are available::

constant:

Changing the colour temperature has no effect on the set brightness. The sum of the Warm White and Cold White components equals 100 %. An increase in the Warm White component results in a reduction in the Cold White component and vice versa.

Example illustration of colour mixing with a linear dimming curve:

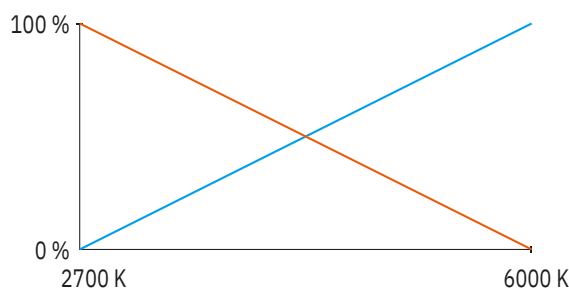


Figure 18: Diagram – TW Constant brightness at the output

If the colour temperature is set to Warm White (2700 K), Warm White has 100 % output power. If the colour temperature is now shifted to Cold White, the output power of Warm White decreases and the output power of Cold White increases accordingly. The overall brightness remains constant over the entire range of the colour temperature change.

The constant brightness can be overridden with relative dimming processes if the parameter **“Override 100 % brightness with relative dimming”** is activated. For example, an absolute dimming value of 100 % can be increased with relative dimming processes up to 100 % brightness for both Warm White and Cold White.

maximum:

Changing the colour temperature always affects the set brightness. In this operating mode, Warm White and Cold White can be controlled up to 100 %. This achieves a higher overall brightness. (The parameter **“Limit outputs A+B to 100 % (illuminant protection)”** in the **“General settings”** has a higher priority and overrides this function if necessary).

Example illustration of colour mixing with a linear dimming curve:

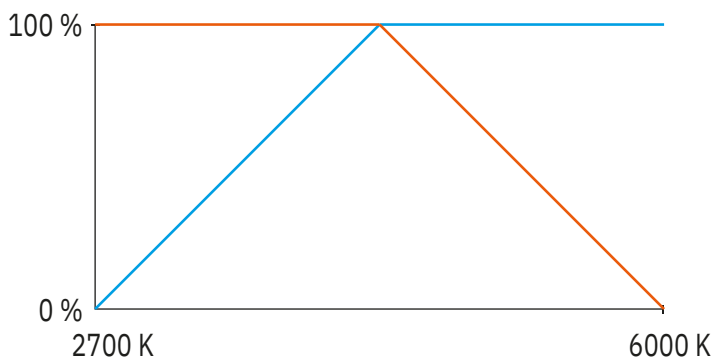


Figure 19: Diagram – Output power: maximum brightness

If the colour temperature is set to Warm White (2700 K), Warm White has 100 % output power and Cold White has 0 % output power. If the colour temperature is now shifted to Cold White, the output power of Cold White increases without the output power of Warm White being reduced.

6.2.12.2 Dim2Warm

The **Dim2Warm** function is used to automatically adjust the colour temperature when the brightness changes.

Important: If Dim2Warm is activated, it is no longer possible to adjust the colour temperature manually. This is then done dynamically by changing the brightness! The communication objects are hidden.

Dim2Warm automatically shifts the colour temperature to a “warm” colour temperature when the brightness is reduced.

The following diagram shows the adjustment of the colour temperature for a “warm” colour temperature of 2700 K and a “cold” colour temperature of 6000 K in the range of 0 - 100 %:

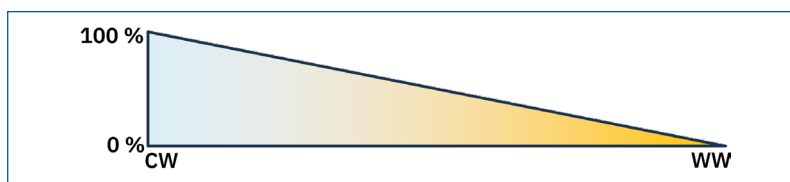


Figure 20: Diagram – Dim2Warm

The Dim2Warm function shifts the colour temperature in this example from 2700 K at 0 % brightness to 6000 K at 100 % brightness.

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Automatic setting of colour temperature		
Dim2Warm	<ul style="list-style-type: none"> ■ not active ■ active 	Activation of the “Dim2Warm” function.
Example process	<input type="checkbox"/>	When activated (tick the box with a mouse click), a diagram with the progression appears.
All of the following parameters are visible when “Dim2Warm” is active		
Control of colour temperature valid for	<ul style="list-style-type: none"> ■ all dimming processes ■ dimming relative and absolute ■ dimming ON/OFF ■ dimming relative, dimming absolute and dimming ON/OFF 	Setting for which dimming processes Dim2Warm is active.
Colour temperature ...	<ul style="list-style-type: none"> ■ 0 % KW, 100 % WW (warm +++) ■ 5 % KW, 95 % WW (warm ++) ■ 10 % KW, 90 % WW (warm +) ■ : ■ 95 % KW, 5 % WW (cold ++) ■ 100 % KW, 0 % WW (cold +++) 	Definition of the colour temperature to be reached at the lower end of the dimming process.
... on reaching	0 – 45 % [0 %]	Brightness value at the lower end of the dimming process.
Colour temperature ...	<ul style="list-style-type: none"> ■ 0 % KW, 100 % WW (warm +++) ■ 5 % KW, 95 % WW (warm ++) ■ 10 % KW, 90 % WW (warm +) ■ : ■ 95 % KW, 5 % WW (cold ++) ■ 100 % KW, 0 % WW (cold +++) 	Definition of the colour temperature to be reached at the upper end of the dimming process.
... on reaching	50 – 100 % [100 %]	Brightness value at the upper end of the dimming process.

Table 49: Settings – Dim2Warm

The “**Control of colour temperature valid for**” parameter defines the dimming processes for which the Dim2Warm function should apply. The settings have the following effect:

- **all dimming processes:**
Dim2Warm is active for all dimming processes (ON/OFF, Dimming relative and absolute), when calling up scenes, bit scenes or lock/forced functions. Sequences are excluded.
- **dimming relative and absolute:**
Dim2Warm is only active for dimming processes via the objects “TW Brightness - Dimming absolute” and “TW Brightness - Dimming relative”.
- **dimming ON/OFF:**
Dim2Warm is only active for switch-on/switch-off processes via the 1 Bit object “LED TW - Switch”.
- **dimming relative, dimming absolute and dimming ON/OFF:**
Dim2Warm is active for dimming processes via the objects “TW Brightness - Dimming absolute”, “TW Brightness - Dimming relative” and for switching on/off via the 1 Bit object “TW - Switch”, but not for calling up scenes, bit scenes, sequences or lock/forced functions.

Example:

Colour temperature ...	0 % KW, 100 % WW
... on reaching	20 %
Colour temperature ...	100 % KW, 0 % WW
... on reaching	80 %

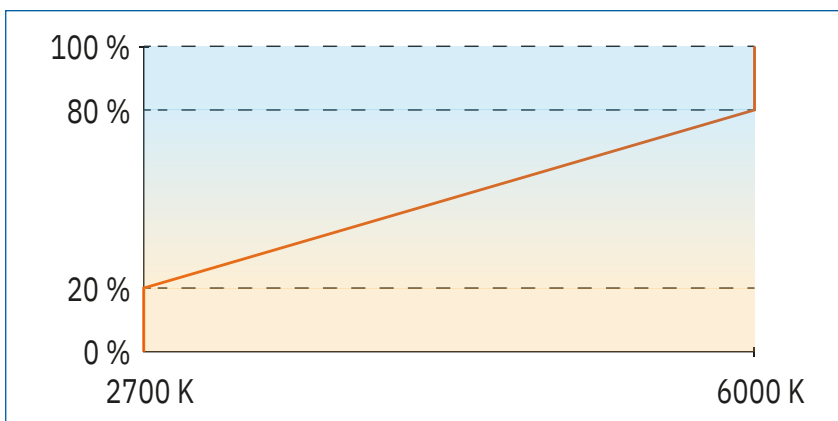


Figure 21: Diagram – Example for Dim2Warm

In this example, the Dim2Warm function shifts the colour temperature from 2700 K at 20 % brightness to 6000 K at 80 % brightness. Below 20 % brightness, the colour temperature remains constant at 2700 Kelvin. Above 80 %, it remains constant at 6000 Kelvin.

Note: Preset colour temperatures are ignored when colour temperature control is active.

6.2.13 Lock and Force functions

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Lock object 1/2 – Data point type	<ul style="list-style-type: none"> ■ not active ■ 1 Bit DPT 1.001 Switch ■ 2 Bit DPT 2.001 Switch control ■ 1 Byte DPT 5.001 Percent (0...100 %) 	Activation and selection of the data point type for the lock object.
Lock object – 1 Bit (specific settings)		
Action on value = 1	<ul style="list-style-type: none"> ■ lock ■ unlock/release 	Setting the action on receipt of a “1” on the lock object.
Action on value = 0	Is set automatically. Always opposite action of “Action on value = 1”	Setting the action on receipt of a “0” on the lock object. Fixed, cannot be changed.
Lock object – 2 Bit (specific settings)		
Action on value „Force ON“	lock	Action on receipt of the value “Force ON” on the lock object. Fixed, cannot be changed.
Action on value „Force OFF“	<ul style="list-style-type: none"> ■ lock -> OFF ■ no change 	Action on receipt of the value “Force OFF” on the lock object.
Action on value „Force End“	unlock/release	Action on receipt of the value “Force End” on the lock object. Fixed, cannot be changed.
Lock object – 1 Byte (specific settings)		
Action on value = 0 %	unlock/release	Action on receipt of the value 0 %. Fixed, cannot be changed.
Action on value unequal 0 %	lock -> dimming value = object value	Action on receipt of a value greater than 0 %. Fixed, cannot be changed.

ETS Text	Dynamic range [Default value]	Comment
Generally valid parameters (exceptions, see comment)		
Action on locking	<ul style="list-style-type: none"> ■ switch off ■ switch-on value „Day“/“Night“ ■ hold value / no change ■ fixed CW and WW values ■ fixed TW values and brightness ■ change colour temperature ■ change brightness ■ start sequence 1 ■ start sequence 2 ■ start HCL ■ stop HCL / sequence 	<p>Setting the action to be performed after a lock has been set.</p> <p>Only available with Lock objects „1 Bit“ and „2 Bit“.</p>
Value: Cold White	0 – 100 % [0 %]	Determination of the value Only for “fixed CW and WW values”.
Value: Warm White	0 – 100 % [100 %]	Determination of the value Only for “fixed CW and WW values”.
Colour temperature	<ul style="list-style-type: none"> ■ 0 % CW, 100 % WW (warm +++) ■ 5 % CW, 95 % WW (warm ++) ■ 10 % CW, 90 % WW (warm +) ■ : ■ 95 % CW, 5 % WW (cold ++) ■ 100 % CW, 0 % WW (cold +++) 	Determination of the value. Only for “Change Colour temperature” and “Fixed TW values and brightness “
Brightness	0 – 100 % [100 %]	Determination of the value. Only for “Change brightness” and “Fixed TW values and brightness “.
Action on unlocking	<ul style="list-style-type: none"> ■ switch off ■ switch-on value „Day“/“Night“ ■ hold value / no change ■ value before locking ■ fixed CW and WW values ■ fixed TW values and brightness ■ change colour temperature ■ change brightness ■ start sequence 1 ■ start sequence 2 ■ start HCL ■ stop HCL / sequence 	Setting the action to be performed after a lock is cancelled.
Value: Cold White	0 – 100 % [0 %]	Determination of the value Only for “fixed CW and WW values”.

ETS Text	Dynamic range [Default value]	Comment
Value: Warm White	0 – 100 % [100 %]	Determination of the value Only for “fixed CW and WW values”.
Colour temperature	<ul style="list-style-type: none"> ■ 0 % CW, 100 % WW (warm +++) ■ 5 % CW, 95 % WW (warm ++) ■ 10 % CW, 90 % WW (warm +) ■ : ■ 95 % CW, 5 % WW (cold ++) ■ 100 % CW, 0 % WW (cold +++) 	Determination of the value. Only for “Change Colour temperature” and “Fixed TW values and brightness “
Brightness	0 – 100 % [100 %]	Determination of the value. Only for “Change brightness” and “Fixed TW values and brightness “.
Dimming speed	0 ... 14400 s [2]	Setting the time in which the called value is to be dimmed. Only shown for adjustable values.
Fallback time for lock (0 = not active)	0 ... 32000 s [0]	Setting whether and at what time the locking function should be automatically reset.
Priority of lock	<ul style="list-style-type: none"> ■ not active ■ Lock 1 before Lock 2 	Activation of a priority for the two lock objects.

Table 50: Settings – Lock and Force functions

Lock objects 1 and 2 can be triggered via different data point types. The respective behaviour is as follows:

- **1 Bit object**
This determines whether the channel is to be locked or unlocked with a “0” or a “1”
- **2 Bit object**
With the 2 Bit forced guidance, the channel is locked with the object value “ Force ON” (1/1). The channel is unlocked with the object value “Force End” (0/0). These settings are fixed and cannot be changed.
The object value “Force OFF” (1/0) can be used to set whether a lock is set for the channel and simultaneously switched off or whether the channel remains in the current state (“no change”).
- **1 Byte object**
When any dimming value greater than 0 % is received, the channel is locked and simultaneously set to the received value. When the value “0 %” is received, the channel is unlocked again.

As soon as a channel is locked or unlocked, you can set how it should behave.

Important: When locking via a 1 Byte object, no action can be defined as the channel is always set to the received value here.

- **switch off**
The channel is switched off.
- **switch-on value „Day“/“Night“**
The channel calls up the configured switch-on value (corresponding to “Day” or “Night” mode).
- **hold value / no change**
The channel remains at the current value.
- **value before locking** (*only for unlocking*)
The channel restores the value that was valid before it was blocked.
- **fixed CW and WW values**
Fixed values are dimmed for Cold White and Warm White.
- **fixed TW values and brightness**
Fixed values for the colour temperature and brightness are dimmed.
- **change colour temperature**
A fixed value for the colour temperature is defined and dimmed. The brightness remains at its current value.
- **change brightness**
A fixed value for the dimmed brightness is defined and dimmed. The colour temperature remains at its current value.
- **start sequence 1/2**
The channel starts the corresponding sequence.
- **start HCL**
HCL is started
- **stop HCL / Sequence**
HCL respectively the current sequence is stopped.

Priority of lock

If “not active” is selected, the following applies: “Unlock” of lock 1 or 2 unlocks both locks. If “Lock 1 before lock 2” is selected, the following applies: If both locks are set, the action of lock 1 is executed.

Dimming speed

The parameter is only displayed if an action (on locking or unlocking) is set to “brightness value”. The speed therefore only relates to this brightness value.

Fallback time lock

The fallback time defines the time after which a set lock is cancelled. Once the set time has elapsed, the “Action on unlocking” applies. With the setting “0 s”, the fallback time is not active.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
49	TW: – Lock 1		Lock object 1. DPT depending on parameter setting
50	TW: – Lock 2		Lock object 2. DPT depending on parameter setting
51	TW: – Status: Lock	1 Bit	Sending a “1” when the channel is locked and a “0” when the channel is unlocked

Table 51: Communication objects – Lock and Force functions

6.2.14 Scenes

The “Scenes” menu is displayed when the “Scenes” parameter in the “Basic settings” menu is activated. With a scene, it is possible to execute several actions in different trades (e.g. light, heating, roller shutters) simultaneously with one key press or one operating command. All this happens with one telegram. The channels can be integrated into a scene control system using the scene function. To do this, the corresponding scene (A ... H) must be assigned a scene number (1 ... 64) and an action.

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Save scene	<ul style="list-style-type: none"> ■ not active ■ active ■ keep learned scene (do not maintain parameter settings) 	Learning scenes. Activate/deactivate the memory function.
Scene number A – H	not active 1 – 64	Setting the scene number to which the channel should respond.
Action	<ul style="list-style-type: none"> ■ switch off ■ switch-on value „Day“/“Night“ ■ fixed CW and WW values ■ fixed TW values and brightness ■ change colour temperature ■ change brightness ■ start sequence 1 ■ start sequence 2 ■ start HCL ■ stop HCL / sequence ■ activate lock 1 ■ activate lock 2 ■ unlock 	Definition of the action to be performed when the scene is triggered.
Value: Cold White	0 – 100 % [0 %]	Determination of the value Only for “fixed CW and WW values”.
Value: Warm White	0 – 100 % [100 %]	Determination of the value Only for “fixed CW and WW values”.
Colour temperature	<ul style="list-style-type: none"> ■ 0 % CW, 100 % WW (warm +++) ■ 5 % CW, 95 % WW (warm ++) ■ 10 % CW, 90 % WW (warm +) ■ : ■ 95 % CW, 5 % WW (cold ++) ■ 100 % CW, 0 % WW (cold +++) 	Determination of the value. Only for “Change Colour temperature” and “Fixed TW values and brightness “
Brightness	0 – 100 % [100 %]	Determination of the value. Only for “Change brightness” and “Fixed TW values and brightness “.

ETS Text	Dynamic range [Default value]	Comment
Dimming speed	0 ... 14400 s [2]	Setting the time in which the called value is to be dimmed. Only shown for adjustable values.

Table 52: Settings – Scenes

If the “**Save scene**” parameter is activated, a scene value can be changed and saved after the scene is called up. To do this, the triggering button must also be set to “save => active”. If the button is now pressed and held, the corresponding value is sent to the bus for saving (see table on next page). The new value is then saved and will be executed the next time the scene is called up.

The parameter „**keep learned scene (do not maintain parameter settings)**“ ensures that a learnt scene is retained even after reprogramming.

Note: Only applies to actions in which fixed values are defined.

The following actions can be performed when a scene is called up:

- **switch off**
The channel is switched off.
- **switch-on value „Day“/“Night“**
The channel calls up the configured switch-on value (corresponding to “Day” or “Night” mode).
- **fixed CW and WW values**
Fixed values are dimmed for Cold White and Warm White.
- **fixed TW values and brightness**
Fixed values for the colour temperature and brightness are dimmed.
- **change colour temperature**
A fixed value for the colour temperature is defined and dimmed. The brightness remains at its current value.
- **change brightness**
A fixed value for the dimmed brightness is defined and dimmed. The colour temperature remains at its current value.
- **start sequence 1/2**
The channel starts the corresponding sequence.
- **start HCL**
HCL is started
- **stop HCL / Sequence**
HCL respectively the current sequence is stopped..
- **activate Lock 1/2**
The corresponding lock is activated.
- **unlock**
The channel is unlocked.

Note: A KNX scene is transmitted using a 1 Byte group address. Scene 1 corresponds to the transmitted decimal value “0” or the hex value “00” when it is called up. While the decimal value “128” or the hex value “80” is transmitted to save scene 1. The following table illustrates the relationship between the scene number and the transmitted value and helps with diagnostics via the ETS group monitor.

Scene No.	Call		Save	
	Decimal	Hexadecimal	Decimal	Hexadecimal
1	0	0x00	128	0x80
2	1	0x01	129	0x81
3	2	0x02	130	0x82
...
64	63	0x3f	191	0xBF

Table 53: Codes for calling and saving of scenes

The following table shows the associated communication object:

Number	Name / Object function	Length	Usage
44	TW: – Scene	1 Byte	Call up/saving of scenes

Table 54: Communication object – Scene

6.2.15 Bit Scenes

The “Bit Scenes” menu is displayed when the “Bit scenes” parameter in the “Basic settings” menu is activated.

The functionality of the bit scenes is similar to the normal scene function, except that an action can be called up for both the value “1” and the value “0”. The bit scenes can thus be triggered via simple switch functions.

A text field for free labelling is available for each bit scene:

Object description	Lighting TV
--------------------	-------------

Figure 22: Text field – Object description

A text of up to 30 characters can be stored for the field. The text entered appears in the channel’s communication objects:

45	TW Bit Scene 1: Lighting TV	Start
----	-----------------------------	-------

Figure 23: Bit scenes-- Object description

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Bit Scene 1 – 4	<ul style="list-style-type: none"> ■ not active ■ active 	Activate/deactivate a bit scene.
Action on value = 1 / 0	<ul style="list-style-type: none"> ■ switch off ■ switch-on value „Day“/“Night“ ■ hold value / no change ■ fixed CW and WW values ■ fixed TW values and brightness ■ change colour temperature ■ change brightness ■ start sequence 1 ■ start sequence 2 ■ start HCL ■ stop HCL / sequence ■ activate lock 1 ■ activate lock 2 ■ unlock 	Definition of the action to be performed when the Bit Scene is triggered.
Value: Cold White	0 – 100 % [0 %]	Determination of the value Only for “fixed CW and WW values”.
Value: Warm White	0 – 100 % [0 %]	Determination of the value Only for “fixed CW and WW values”.

ETS Text	Dynamic range [Default value]	Comment
Colour temperature	<ul style="list-style-type: none"> ■ 0 % CW, 100 % WW (warm +++) ■ 5 % CW, 95 % WW (warm ++) ■ 10 % CW, 90 % WW (warm +) ■ : ■ 95 % CW, 5 % WW (cold ++) ■ 100 % CW, 0 % WW (cold +++) 	Determination of the value. Only for “Change Colour temperature” and “Fixed TW values and brightness “
Brightness	0 – 100 % [100 %]	Determination of the value. Only for “Change brightness” and “Fixed TW values and brightness “.
Dimming speed	0 ... 14400 s [2]	Setting the time in which the called value is to be dimmed. Only shown for adjustable values.

Table 55: Settings – Bit Scenes

The following actions can be carried out with the values “1” and “0”:

- **switch off**
The channel is switched off.
- **switch-on value „Day“/“Night“**
The channel calls up the configured switch-on value (corresponding to “Day” or “Night” mode).
- **hold value / no change**
The channel remains at the current value.
- **fixed CW and WW values**
Fixed values are dimmed for Cold White and Warm White.
- **fixed TW values and brightness**
Fixed values for the colour temperature and brightness are dimmed.
- **change colour temperature**
A fixed value for the colour temperature is dimmed. The brightness remains at its current value.
- **change brightness**
A fixed value for the dimmed brightness is dimmed. The colour temperature remains at its current value.
- **start sequence 1/2**
The channel starts the corresponding sequence.
- **start HCL**
HCL is started
- **stop HCL / Sequence**
HCL respectively the current sequence is stopped..
- **activate Lock 1/2**
The corresponding lock is activated.
- **unlock**
The channel is unlocked.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
45	TW Bit Scene 1: – Start	1 Bit	Calling up bit scene 1
46	TW Bit Scene 2: – Start	1 Bit	Calling up bit scene 2
47	TW Bit Scene 3: – Start	1 Bit	Calling up bit scene 3
48	TW Bit Scene 4: – Start	1 Bit	Calling up bit scene 4

Table 56: Communication objects – Bit scenes

6.2.16 Sequences

The menus for “Sequence 1” and “Sequence 2” are displayed with the respective activation of the parameters “Sequence 1” and “Sequence 2” in the “Basic settings” menu.

The two sequences can then be configured individually in the respective menu.

A text field for free labelling is available for each sequence:

Function/Object description	Evening mood
-----------------------------	--------------

Figure 24: Text field - Function/Object description

A text of up to 30 characters can be stored for the field.

The text entered in “**Function/Object description**” appears both in the menu behind the channel and in the channel’s communication objects:

Sequence 1: Evening mood	52	TW Sequence 1: Evening mood	Start/Stop
	53	TW Sequence 1: Evening mood	Status

Figure 25: Sequence – Function/Object description

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
General settings		
Output “Status dimming value” during sequence	<ul style="list-style-type: none"> <input type="checkbox"/> not active <input checked="" type="checkbox"/> active 	Setting whether the current brightness/colour temperature status should be sent during the sequence.
Action on brightness change via “Dimming absolute/relative”	Sequence is stopped	Sequence is stopped if a change is made during the run. Fixed setting, cannot be changed.
Fallback to sequence after brightness change	<ul style="list-style-type: none"> <input type="checkbox"/> not active <input checked="" type="checkbox"/> active 	Activation of a fallback time when the sequence starts again if it was previously stopped by dimming.
Fallback time	00:00:00 hh:mm:ss [00:01:00]	Definition of the fallback time in hours/minutes/seconds.
Behaviour with “OFF”	<ul style="list-style-type: none"> <input type="checkbox"/> stop sequence <input checked="" type="checkbox"/> switch off 	Setting for how the sequence should respond to an OFF telegram.
Send object „TW Sequence 1 - Status“	<ul style="list-style-type: none"> <input type="checkbox"/> not active <input checked="" type="checkbox"/> on change <input type="checkbox"/> on change and repeated restart 	Setting whether and when the status of the sequence should be sent.

ETS Text	Dynamic range [Default value]	Comment
Sequence settings		
Switch sequence with	<ul style="list-style-type: none"> ■ fixed values ■ random values 	Setting as to whether the brightness values for the individual steps should be permanently defined or whether random values should be generated.
Transition time: Random	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the time between two steps should be random. When selecting with “random values”.
Endless loop	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the sequence should be repeated endlessly in a loop.
Number of cycles	1 ... 255 [1]	Setting for how often the sequence should be repeated. Only if „Endless loop - not active“.
Behaviour after sequence	<ul style="list-style-type: none"> ■ switch off ■ hold values ■ start sequence 1 ■ start sequence 2 ■ start HCL ■ state before sequence 	Setting how the channel should behave after the end of the sequence. „state before sequence“ only if „Endless loop - not active“.
Number of steps	1 – 5 [5]	Setting for how many steps the sequence is divided into.
Definition of step 1 - 5		
Colour temperature randomly from ...	<ul style="list-style-type: none"> ■ 0 % KW, 100 % WW (warm +++) ■ 5 % KW, 95 % WW (warm ++) ■ 10 % KW, 90 % WW (warm +) ■ : ■ 95 % KW, 5 % WW (cold ++) ■ 100 % KW, 0 % WW (cold +++) 	Definition of the lower limit value. When selecting with “random values”.
Colour temperature randomly to ...	<ul style="list-style-type: none"> ■ 0 % KW, 100 % WW (warm +++) ■ 5 % KW, 95 % WW (warm ++) ■ 10 % KW, 90 % WW (warm +) ■ : ■ 95 % KW, 5 % WW (cold ++) ■ 100 % KW, 0 % WW (cold +++) 	Definition of the upper limit value. When selecting with “random values”.
Brightness randomly from ...	0 – 100 % [0 %]	Definition of the lower limit value. When selecting with “random values”.

ETS Text	Dynamic range [Default value]	Comment
Brightness randomly to ...	0 – 100 % [100 %]	Definition of the upper limit value. When selecting with “random values”.
Colour temperature	<ul style="list-style-type: none"> ■ 0 % KW, 100 % WW (warm +++) ■ 5 % KW, 95 % WW (warm ++) ■ 10 % KW, 90 % WW (warm +) : ■ 95 % KW, 5 % WW (cold ++) ■ 100 % KW, 0 % WW (cold +++) 	Definition of the colour temperature for the step. When selecting with “fixed values”.
Brightness	0 – 100 % [100 %]	Definition of the brightness for the step. When selecting with “fixed values”.
Hold time	0 ... 65535 x 100 ms [50]	Setting for how long the step should be executed.
Transition time to the next step	0 ... 65535 s [10]	Definition of the time from one step to the next.
Random time to the next step	0 ... 65535 s [10]	Setting the maximum random time from one step to the next. Only selection with “Random values” and “Transition time random - active”.

Table 57: Settings – Sequences

The parameter “**Output “Status dimming value” during sequence**” activates the status output (in %) to all object “Status: Dimming value” while a sequence is running.

Important: Sending conditions are defined in the menu „Basic settings“ under „Status output“.

If the “**Fallback to sequence after brightness change**” parameter is activated, a time can be defined after which the sequence is restarted if it was previously stopped by a dimming command (relative or absolute).

The “**Behaviour with “OFF”**” parameter defines whether the light source is switched off completely when the sequence is switched off or whether only the sequence should be stopped.

The sending behaviour of the status object is defined via “**Send object “TW Sequence 1 - Status”**”. The setting “on change” specifies that the status is sent every time there is a change. The setting “on change and repeated restart” causes the status to be sent after every change and also after every run of the sequence.

Switch sequence with

If the sequence is controlled **with fixed values**, a fixed brightness value is defined for each step in the sequence, which is to be called up for the corresponding step.

If the sequence is controlled **with random values**, the values are generated randomly by the device. A minimum and a maximum brightness value are defined for each step. A brightness value for the step is dimmed within these limits.

If the “**Transition time: random**” parameter is “**not active**”, the transition time for each step is set to a fixed value.

If “**Transition time: random**” is “**active**”, the “**Transition time up to next step**” parameter changes to “**Random time to next step**” for each step.

Important: The random time is a value between “0 s” and the defined value!

Endless loop

With the setting “**Endless loop**” - “**active**”, the sequence is run through up to when it is stopped via the communication object for this sequence or via “**Dimming absolute/relative**”. The other parameters for setting the loop runs are omitted in this case.

If the “**Endless loop**” setting is “**not active**”, you can specify how often the sequence should be run through.

In addition, a behaviour can be defined after the end of the sequence:

- **switch off**
The channel is switched off.
- **hold value**
The channel remains at the current value.
- **start sequence 1/2**
The channel starts the corresponding sequence.
- **start HCL**
The channel starts time-dependent dimming.
- **state before sequence** (*Only for selection with setting “Endless loop - not active”*).
The channel assumes the state it had before the start of the sequence

Steps

A fixed colour temperature, a fixed brightness value, a hold time and a transition time are defined for each step.

The **hold time** specifies how long a step should be executed or how long the sequence should remain in this state.

The **transition time/random time** defines the time in which dimming should take place from one step to the next.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
52	TW Sequence 1: – Start/Stop	1 Bit	Activating/stopping sequence 1
53	TW Sequence 1: – Status	1 Bit	Sending the status of sequence 1
54	TW Sequence 2: – Start/Stop	1 Bit	Activating/stopping sequence 2
55	TW Sequence 2: – Status	1 Bit	Sending the status of sequence 2

Table 58: Communication objects – Sequences

6.2.17 TW Human Centric Lighting (HCL)

The „Human Centric Lighting (HCL)“ menu is displayed when the „Human Centric Lighting (HCL)“ parameter is activated in the “Basic settings” menu.

Human Centric Lighting refers to a time-controlled sequence in which the light colour adapts dynamically to the course of the day.

A text field for free labelling is available for „TW Human Centric Light (HCL)“:

Function/Object description	Evening mood
-----------------------------	--------------

Figure 26: Text field - Function/Object description

A text of up to 30 characters can be stored for the field.

The text entered in “**Function/Object description**” appears both in the menu behind the channel and in the channel’s communication objects:

Human Centric Lighting (HCL): Evening mood	56	TW HCL: Evening mood	Start/Stop
	57	TW HCL: Evening mood	Status

Figure 27: HCL – Function/Object description

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
General settings		
Output “Status dimming value” during HCL	<ul style="list-style-type: none"> not active active 	Setting whether the current brightness/ colour temperature status should be sent during HCL.
Switching times	<ul style="list-style-type: none"> fixed times sunrise/sunset 	Setting how the switching times are to be defined.
HCL controls	<ul style="list-style-type: none"> colour temperature brightness colour temperature and brightness 	Setting which values are to be controlled via HCL.
Switch-on value: Brightness	last brightness value 0,5 – 100 %	Setting the brightness when switching on. For “HCL controls - colour temperature” and “Day/night” object -> not active.
Switch-on value: Brightness “Day”	last brightness value 0,5 – 100 %	Setting the brightness when switching on in “Day” mode. For “HCL controls - colour temperature”.

ETS Text	Dynamic range [Default value]	Comment
Switch-on value: Brightness „Night“	like „Day“ 0,5 – 100 %	Setting the brightness when switching on in “Day” mode. For “HCL controls - colour temperature”
Fallback to HCL after „Dimming absolute/ relative“ of colour temperature	<ul style="list-style-type: none"> ■ not active ■ active 	Activation of a fallback time when time-dependent dimming starts again if it was previously stopped by dimming. For “HCL controls - colour temperature”
Fallback to HCL after „Dimming absolute/ relative“ of brightness	<ul style="list-style-type: none"> ■ not active ■ active 	Activation of a fallback time ... For “HCL controls - brightness”.
Fallback to HCL after „Dimming absolute/ relative“ of colour temperature/brightness	<ul style="list-style-type: none"> ■ not active ■ active 	Activation of a fallback time ... For “HCL controls - colour temperature and brightness”.
Fallback time	00:00:01 ... 12:00:00 hh:mm:ss [00:01:00]	Definition of the fallback time in hours/minutes/seconds.
Behaviour with “OFF”	<ul style="list-style-type: none"> ■ stop HCL ■ switch off 	Setting for how HCL should respond to an OFF telegram.
Definition of steps 1 - 10		
Step 1 – 10: Time	00:00 ... 23:59 hh:mm	Definition of the time for the corresponding step. For “Switching times” - “Fixed times”.
Step 1 – 10: Time	<ul style="list-style-type: none"> ■ sunrise -5 h ■ sunrise -4 h ■ sunrise -3 h : ■ sunset +4 h ■ sunset +5 h 	Definition of the time for the corresponding step. For “Switching times” - “Sunrise/sunset”.
Colour temperature	<ul style="list-style-type: none"> ■ 0 % KW, 100 % WW (warm +++) ■ 5 % KW, 95 % WW (warm ++) ■ 10 % KW, 90 % WW (warm +) : ■ 95 % KW, 5 % WW (cold ++) ■ 100 % KW, 0 % WW (cold +++) 	Definition of the colour temperature for the corresponding step.
Brightness	0 – 100 %	Definition of the brightness for the corresponding step.

Table 59: Settings – Human Centric Lighting (HCL)

HCL can be used to adjust the colour temperature over an entire day. Depending on the time, the channel adjusts the colour temperature and, if set, the brightness of the LEDs. HCL can be realised either on the basis of fixed times or on the basis of sunrise and sunset times (which the LED controller calculates itself). For this purpose, 10 steps (time + values to be controlled) can be defined. The set values for colour temperature and brightness are then reached at the set time. The LED controller interpolates between the interpolation points. This means, for example, for the setting “Colour temperature 3000 K” for “8:00 am” and “Colour temperature 3500 K” for “10:00 am”, that the device slowly dims from 3000 K to 3500 K within 2 hours.

The parameter “**Output “Status dimming value” during HCL**” activates the status output (in %) to all object “Status: Dimming value” while HCL is running.

Important: Sending conditions are defined in the menu „Basic settings“ under „Status output“.

The “**Switching times**” can be set either via fixed times (selection in the range from “00:00 to 23:59”) or depending on sunrise/sunset (selection in the range from “Sunrise -5 h / 5 h” and “Sunset -5 h / +5 h”).

Important: For internal calculation, a current time and date must be sent to the LED controller via the corresponding objects.

The “HCL controls” selection can be used to set which values are available within the steps for controlling HCL. The 3 different settings are as follows:

- **Colour temperature:** Only the colour temperature at the respective time can be defined for each step. A further parameter “Switch-on value: Brightness” appears. A fixed switch-on value is defined there that applies independently of the various steps.
Note: HCL remains active after “Dimming absolute/relative” of the brightness.
- **Brightness:** Only the brightness at the respective time can be defined for each step. The last value applies to the colour temperature.
Note: HCL remains active after “Dimming absolute/relative” of the colour temperature.
- **Colour temperature and brightness:** Colour temperature and brightness can be set in each step.

If “**Fallback to HCL after “Dimming absolute/relative of colour temperature and/or brightness”**” (*text corresponding to the selection for “HCL controls”*) is activated, a “**Fallback time**” can be defined after which the process is restarted if it was previously stopped by a dimming command (absolute or relative).

The “**Behaviour with “OFF”**” parameter defines whether the light is switched off completely when HCL is switched off or whether only time-dependent dimming is stopped.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
56	TW HCL: – Start/Stop	1 Bit	Activating/stopping of HCL
57	TW HCL: – Status	1 Bit	Sending the current status

Table 60: Communication objects – Human Centric Lighting (HCL)

7 Index

7.1 List of figures

Figure 1: Wiring diagram – Constant current.....	7
Figure 2: Wiring diagram – Constant voltage.....	7
Figure 3: Structure & Handling.....	8
Figure 4: Diagram – Dimming curve progression	16
Figure 5: Text field - Channel/Object description.....	22
Figure 6: Channel/Object description	22
Figure 7: Sequence diagram – Staircase light	24
Figure 8: Function diagram – Switch-on/Switch-off delay.....	25
Figure 9: Text field – Object description	42
Figure 10: Bit scenes-- Object description	42
Figure 11: Text field - Function/Object description.....	44
Figure 12: Sequence – Function/Object description.....	44
Figure 13: Text field - Function/Object description.....	48
Figure 14: Time-dependent dimming – Function/object description.....	48
Figure 15: Text field - Channel/Object description.....	52
Figure 16: Channel/Object description	52
Figure 17: Function diagram – Switch-on/Switch-off delay	54
Figure 18: Diagram – TW Constant brightness at the output.....	67
Figure 19: Diagram – Output power: maximum brightness.....	68
Figure 20: Diagram – Dim2Warm.....	69
Figure 21: Diagram – Example for Dim2Warm	71
Figure 22: Text field – Object description.....	80
Figure 23: Bit scenes-- Object description	80
Figure 24: Text field - Function/Object description.....	83
Figure 25: Sequence – Function/Object description.....	83
Figure 26: Text field - Function/Object description.....	87
Figure 27: HCL – Function/Object description	87

7.2 List of tables

Table 1: Communication objects – Standard settings: Single channels	10
Table 2: Communication objects – Standard settings: Tunable White	11
Table 3: Communication objects – Central objects.....	12
Table 4: General settings.....	15
Table 5: General communication objects	17
Table 6: Diagnosis texts.....	18
Table 7: Communication objects – Alarms	19
Table 8: Communication objects – Status: Output stage	19
Table 9: Specific settings – Single channels.....	20
Table 10: Settings – Staircase light.....	23
Table 11: Communication object – Staircase light.....	24
Table 12: Settings – Switch-on/Switch-off delay	25
Table 13: Settings – Switch-on behaviour	27
Table 14: Settings – Dimming speeds.....	29
Table 15: Settings – Minimum/Maximum brightness.....	30
Table 16: Settings – Switch-off via “Dimming relative”	31
Table 17: Settings – Status output.....	32
Table 18: Communication objects – Status objects	32
Table 19: Settings – Behaviour after reset	33
Table 20: Settings – Central objects	34
Table 21: Communication objects – Central objects.....	34
Table 22: Settings – Lock and Force functions	36
Table 23: Communication objects – Lock and Force functions.....	38
Table 24: Settings – Scenes	39
Table 25: Codes for calling and saving of scenes	41
Table 26: Communication object – Scene	41
Table 27: Settings – Bit Scenes.....	42
Table 28: Communication objects – Bit Scenes	43
Table 29: Settings – Sequences.....	45
Table 30: Communication objects – Sequences.....	47
Table 31: Settings – Time-dependent dimming	49
Table 32: Communication objects – Time-dependent dimming.....	50
Table 33: General settings – Tunable White.....	51
Table 34: Settings – Staircase light.....	53
Table 35: Communication object – Staircase light.....	53
Table 36: Settings – Switch-on/Switch-off delay	54
Table 37: Settings – Switch-on behaviour	56
Table 38: Settings – Extended switch-on behaviour	59
Table 39: Settings – Single-channel control.....	61
Table 40: Communication objects – Single-channel control	61

Table 41: Settings – Switch-off/on via “Dimming relative”	62
Table 42: Communication objects – Switch-off/on with “Dimming relative”	62
Table 43: Settings – Dimming speeds.....	63
Table 44: Settings – Status output.....	64
Table 45: Communication objects – Status output	64
Table 46: Settings – Minimum/Maximum brightness.....	65
Table 47: Settings – Behaviour after reset	66
Table 48: Basic settings – Tunable White	67
Table 49: Settings – Dim2Warm	70
Table 50: Settings – Lock and Force functions	74
Table 51: Communication objects – Lock and Force functions.....	76
Table 52: Settings – Scenes	78
Table 53: Codes for calling and saving of scenes	79
Table 54: Communication object – Scene	79
Table 55: Settings – Bit Scenes.....	81
Table 56: Communication objects – Bit scenes	82
Table 57: Settings – Sequences.....	85
Table 58: Communication objects – Sequences.....	86
Table 59: Settings – Human Centric Lighting (HCL)	88
Table 60: Communication objects – Human Centric Lighting (HCL)	89

8 Appendix

8.1 Legal provisions

The devices described above must not be used in conjunction with devices which directly or indirectly serve human, health, or life-safety purposes. Furthermore, the devices described must not be used if their use may cause danger to people, animals, or property.

Do not leave the packaging material carelessly lying around. Plastic foils/ bags etc. can become a dangerous toy for children.

8.2 Disposal



Do not dispose of the old devices in the household waste. The device contains electrical components that must be disposed of as electronic waste. The housing is made of recyclable plastic.

8.3 Assembly



Danger to life from electric current!

The device may only be installed and connected by qualified electricians. Observe the country-specific regulations and the applicable KNX guidelines

The devices are approved for operation in the European Union and in the United Kingdom. The products are respectively marked with the CE and UKCA symbols.

Use in the USA and Canada is prohibited!

Before starting work on the device, always de-energise it using the upstream fuses. After installation, all live terminals and connections must be completely covered by the switch panel cover to prevent accidental contact. It must not be possible to open the switch panel cover without tools.

8.4 History

V1.0	First Version of Technical Manual	DB V3.1	01/2024
V1.1	Extended by AKD-0230CC.02	DB V3.1	04/2024