EAE KNX UNIVERSAL DIMMER

Product Order Nr: 48038

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1.General Features

EAE KNX Universal Dimmer Actuator has 5 independent outputs. Dimming functions can be used by phase dimming only. The device can be operated manually via push button on it. Each channel can be programmed via ETS4 or above.

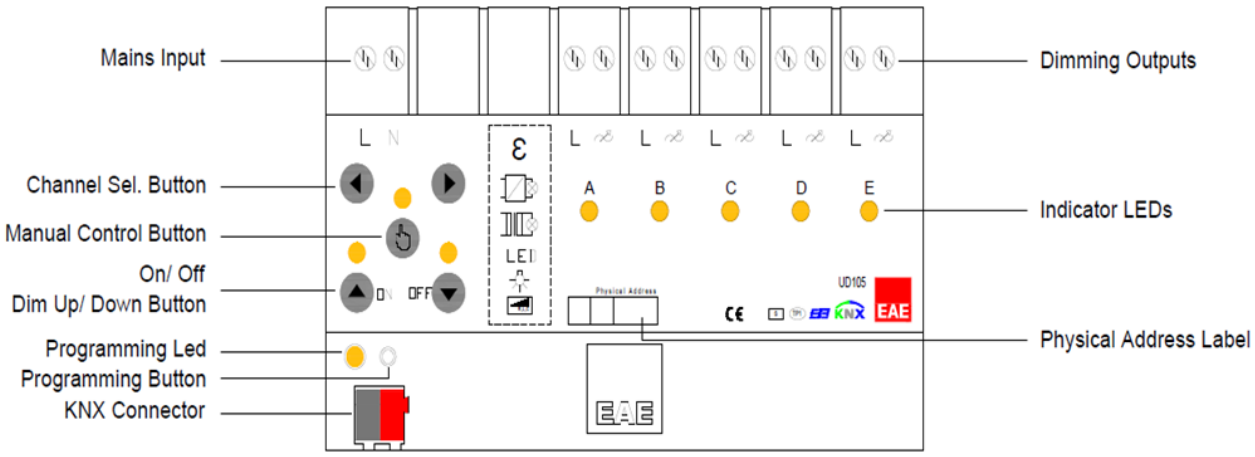
Channel features of dimming actuator;

- Staircase lighting
- Forced Operation
- Channel Grouping (merging outputs for high power lamps)
- Scene Function
- Electrical Measurements (Current, Voltage, Power, Power Factor)
- Error Detection (Short-Circuit, Over-current, Over-voltage, Over-heating)

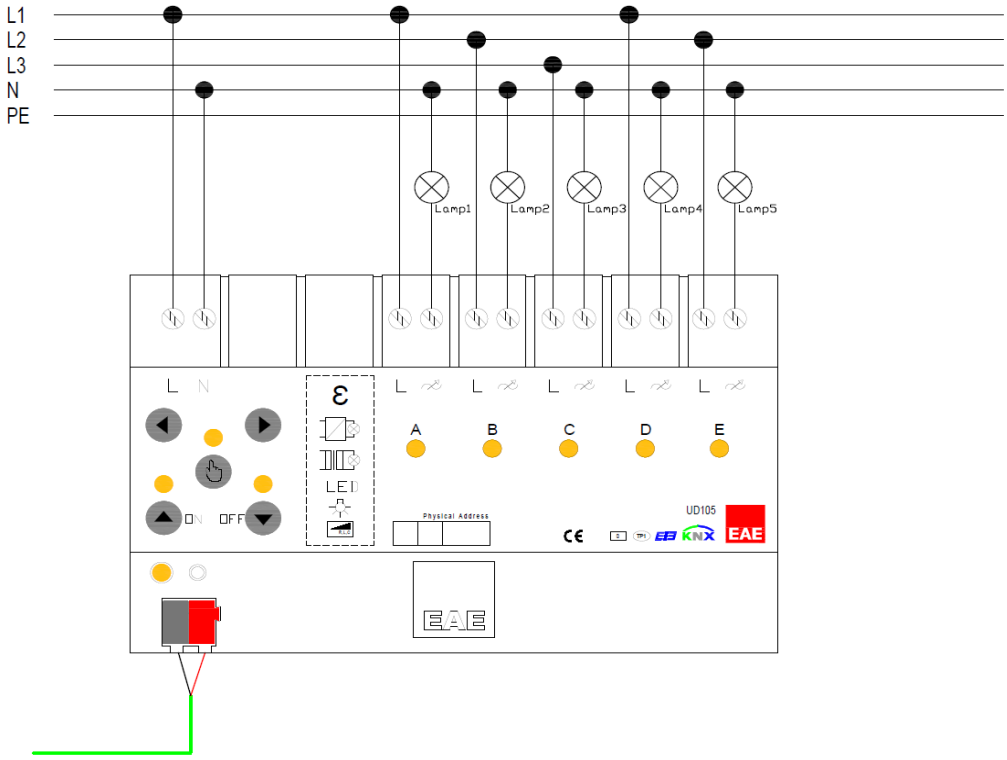
All features can be used separately or together. Please consider that those features will be processed depending on priority. Bus voltage fail/return behavior can be set via ETS configuration.

2.Device Technology

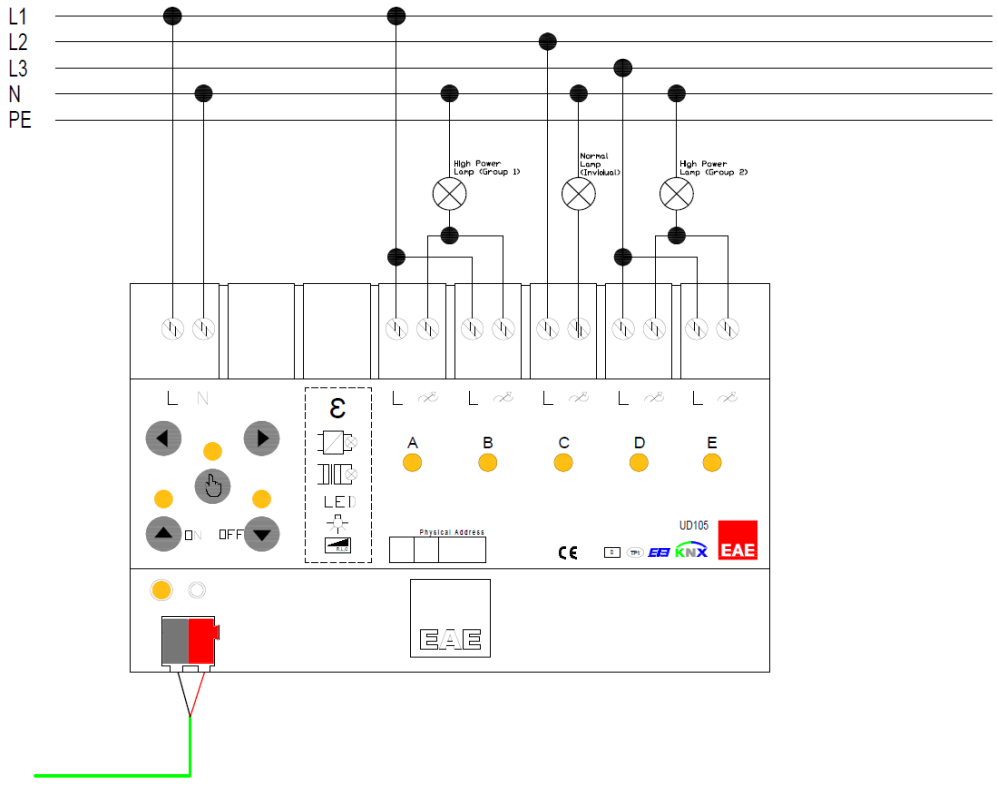
2.1 Device Peripherals



2.2 Connection Diagram



Single Channel Control



Grouped Channel Control

2.3 Technical Data

Protection Type	IP 20	EN 60 529	
Safety class	II	EN 61 140	
KNX Power supply	- Voltage	21V… 30V DC, SELV	
	- Current consumption	< 10 mA	
Mains Supply	Min…Max	185… 300V AC	
Connections	- Screw terminals	0,5…3,31 mm² solid and stranded wire	
		0,5…3,31 mm² stranded wire with ferrule 0.5 Nm	
	- Max. tightening torque	0.5 Nm	
	- KNX	Bus connection terminal	
Output	- Switching & Dimming	5 outputs, Trailing and Leading-Edge Dimming	
	- Cable length	Max. 200 meters	
	- Max. switching power	300 VA per channel 300 W halogen, incandescent lamps per channel 300 W Inductive transformers per channel 250 W Phase-cut dimmable LED lamps per channel Multiplying the output power by parallel connection of channels.	
	- Mechanical Life	Lifetime	
Type of contact	- Electronically controlled		
Installation	- 35mm mounting rail	EN 60 715	
Operating elements	- LED (red) and button	For physical address programming	
	- Manual button	For manual controlling	
	- On/Off Button	For Switching/Dimming lights	
	- Selection Button	For Channel Selection	
Temperature range	- Ambient	-10° C + 50° C	
	- Storage	-25° C + 55° C	
	- Transport	-25° C + 70° C	
Humidity	- Max. air humidity	85 % no moisture condensation	
Dimensions	- L x W x H	90 x 144 x 66 mm	
	- Width in units (18 mm modules)	8 modules	
Box	- Plastic, polycarbonate, colour grey		
CE	- In accordance with the EMC guideline and LV directives		
Application program	Communication objects	Number of addresses(max)	Number of assignments(max)
	101	255	255

NOTE: Device default physical address is 15.15.255. In order to configure Universal Dimming Actuator, ETS application file ".knxprod" is needed. It's possible to download the file on EAE Technology website. ETS is required for programming the device. Parameter settings and related group addresses can be changed by ETS. Learn more by reading ETS help file.

3. Communication Object Table

No	Object Name	Function	DTP Type	Number of bits	Flags
0	General	In operation	1.002	1 bit	CRT
1	General	Scene Control Input	18.001	1 byte	CWU
2, 22, 42, 62, 82	Output A…E	Switching	1.001	1 bit	CWU
3, 23, 43, 63, 83	Output A…E	Switching Status	1.001	1 bit	CRT
4, 24, 44, 64, 84	Output A…E	Absolute dimming	5.001	1 byte	CWU
5, 25, 45, 65, 85	Output A…E	Relative dimming	3.007	4 bit	CRWTU
6, 26, 46, 66, 86	Output A…E	Dimming Status	5.001	1 byte	CRT
7, 27, 47, 67, 87	Output A…E	Forced operation (1-bit)	1.001	1bit	CWU
8, 28, 48, 68, 88	Output A…E	Forced operation (2-bit)	2.001	2 bit	CWU
9, 29, 49, 69, 89	Output A…E	Status Forced Operation	1.003	1 bit	CRT
10, 30, 50, 70, 90	Output A…E	Staircase Trigger	1.003	1 bit	CWU
11, 31, 51, 71, 91	Output A…E	Staircase Permanent	1.001	1 bit	CWU
12, 32, 52, 72, 92	Output A…E	Current (rms)	14.019	4 byte	CRT
13, 33, 53, 73, 93	Output A…E	Voltage (rms)	14.027	4 byte	CRT
14, 34, 54, 74, 94	Output A…E	Mean Active Power	14.056	4 byte	CRT
15, 35, 55, 75, 95	Output A…E	Power Factor	14.057	4 byte	CRT
16, 36, 56, 76, 96	Output A…E	Overcurrent Error	1.011	1 bit	CRT
17, 37, 57, 77, 97	Output A…E	Overvoltage Error	1.011	1 bit	CRT
18, 38, 58, 78, 98	Output A…E	Overheating Error	1.011	1 bit	CRT
19, 39, 59, 79, 99	Output A…E	Hardware Error	1.011	1 bit	CRT
20, 40, 60, 80, 100	Output A…E	Short/Open Circuit Error	1.011	1 bit	CRT

4. Priority Order

Each function has priority according to the other functions. The first has the highest priority.

1- Bus voltage return or failure
2- Forced Operation
3- Permanent ON
4- Staircase Function
5- Brightness, Switch or Scene Control

5. Parameters

5.1 General Parameters

5.1.1 Manual Operation

Manual Operation Button	*Disable* *Active only during KNX Bus failure* ***Active always**

This parameter can be used to determine Manual Operation operating type. When the manual operation is enabled, the connected load can be switched or dimmed via the corresponding channel key. Dimming function has fixed values shown below.

Button Behavior
Short Press ON = Switching ON
Short Press OFF = Switching OFF
Long Press ON = Dimming BRIGHTER
Long Press OFF = Dimming DARKER

Dimming Behavior
Dimming transition time 1…%100 = 10 sec
Allow switching on/off via dimming = no
Dimming type = Start stop

- Set the parameter to “disable”
  This selection is used to disable manual operation.

- Set the parameter to “Active only during KNX Bus failure”
  This selection is used to enable manual operation when KNX Bus failure only.

- Set the parameter to “Active always”
  This selection is used to enable manual operation whether KNX Bus is available or not.

Button activates Manual Operation	*On Single Press* *On 1s / 1.5s / ***2s** / 2.5s / 3s Long Press*

This parameter can be used for selecting Manual Operation activation method of manual button.

- Set the parameter to “On Single Press”
  This selection is used to activate Manual Operation via pressing the Manual button for a short time.

- Set the parameter to “*On 1s / 1.5s / 2s / 2.5s / 3s Long Press*”
  This selection is used to activate Manual Operation via pressing and holding the Manual button for a selected time.

Long operation time of On-Off buttons (x 100ms)	5…***10**…255

This parameter determines dimming activation wait period via manual on – off buttons.

NOTE: Device must be on manual mode.

Auto disable Manual Operation after inactivity	*No* ***Yes***

This parameter can be used to select the Manual Operation disabling method.

- Set the parameter to “No”
  This selection prevents disabling manual operation automatically.

- Set the parameter to “Yes”
  This selection is used to disabling Manual Operation automatically at end of the timeout time.

Timeout time (hh:mm:ss)	***00:00:10…**00:04:15*

This parameter will be shown if *“Auto disable Manual Operation after inactivity”* selected *“Yes”*. Automatic disabling of Manual Operation time can be selected as desired.

Auto enable Manual Operation on KNX Bus failure	*No* ***Yes***

This parameter can be used to enable Manual Operation automatically when KNX Bus failure.

Auto disable Manual Operation after KNX Bus recovery	*No* ***Yes***

This parameter can be used to disable Manual Operation automatically when KNX Bus recovery.

5.1.2 In Operation

Enable sending In operation	***no*** *yes*

This object can be used to report that device is still alive and connected the KNX bus line. Telegram value is selectable as “0” or “1”.

If the parameter selected yes;

In Operation sending period (hh:mm:ss)	*00:00:01…**00:00:10**…18:12:15*

This parameter determines the “In operation” info sending period. In operation telegram will be sent at the end of the period.

Bit value	*0* ***1***

This parameter defines the “In Operation” sending object value.

5.1.3 Channel Grouping

Channel A / B / C / D / E	***Individual*** *Group 1* *Group 2*

This parameter can be used to make the channels individual or grouped. Each channel can be configured independently.

If the load is higher than 300VA, the channels must be grouped.

e.g. If a high-power lamp (700VA) driven is needed, 3 channels must be grouped that device can handle the power. For this case, A, B and C channels can be grouped. Parallel connection is needed for these channels.

NOTE: Channels have alphabetical priority (A-E) for each group. The highest priority channel parameters will be shown on ETS parameters for each group. Additionally, this group parameters can be taken from *Master Channel Parameters or individually.*

e.g. If the *Channel A, C* and *D* is selected as **Group 1** and *Channel B* and *E* is selected as **Group 2.** *Channel A and B* parameters will be shown only. Rest of all channel parameters will be hidden on the ETS parameter screen.

As a result, Channel A parameters are valid for Channel C and D, as well. Group 1 will be controlled through using Channel A and Channel B parameters are valid for Channel E. Group 2 will be controlled through using Channel B.

Also, Channel A or/and B parameters can be taken from Master Channel Parameters or individually.

5.1.4 Telegram Limiting

Enable telegram limiting	*no* ***yes**

This parameter is used to limit the telegram sending in a period. If the parameter is selected “yes”; *Telegram limit count* and *Telegram limit period duration parameters* are visible.

Telegram limit count	*1…***10**…255*

Max number of telegrams per period, can be sent freely.

NOTE: If the value of the object cannot send in the time of period, the object value will be buffered for the next period time. The buffered object value can be updated when the object value is updated.

Telegram limit period	****50ms*** *100ms* *200ms* *500ms* *1s* *2s* *5s* *10s* *30s* *1min*

The limit period can be adjusted via this parameter.

5.2 Master Channel Parameters

5.2.1 Master - Dimming Settings

Dimming Method	*Trailing Edge Dimming* *Leading Edge Dimming* ***Auto detect based on the load type**

This parameter is used to select the dimming method based on light load.

- Set the parameter to “Trailing Edge Dimming”
  This selection is compatible with Trailing Edge driving loads.

- Set the parameter to “Leading Edge Dimming”
  This selection is compatible with Leading Edge driving loads.

- Set the parameter to “Auto detect based on the load type”
  This selection enables automatic load type detection. Loads will be driven after load test procedure.

Dimming Characteristic	***Linear*** *Logarithmic (LED)* *Incandescent Lamps* *Halogen Lamps* *Custom Dimming Curve*

This parameter is used to select dimming characteristic type.

- Set the parameter to “Linear”
  This selection allows dimming with linear line.

- Set the parameter to “Logarithmic (LED)”
  This selection allows dimming with a logarithmic curve that is suitable for LEDs.

- Set the parameter to “Incandescent Lamps”
  This selection allows dimming with a predefined curve most suitable for incandescent lamps.

- Set the parameter to “Halogen Lamps”
  This selection allows dimming with a predefined curve most suitable for halogen lamps.

- Set the parameter to “Custom Dimming Curve”
  This selection allows dimming with desired curve for any other specific light loads.

Maximum dimming percentage	*0… **100***

This parameter is used to limit maximum dimming level for channel.

Minimum dimming percentage	***0**… 100*

This parameter is used to limit minimum dimming level for channel.

5.2.2 Master – Switching

Switching On dimming value	*0… ***100**…Last Value*

This parameter is used to select the dimming level when the relevant output is activated via Switching object.

- Set the parameter to “Last value”
  This selection is used to dim the relevant output through using the saved light level before switched OFF.

Dimming time to Switch On value (0%...100%) (hh:mm:ss:f) (00:00:00:0 = Instant)	*00:00:00:0…***00:00:02:0**…01:49:13:5*

This parameter is used to determine the fade time for Switching On action.

Dimming time to Switch Off value (100%...0%) (hh:mm:ss:f) (00:00:00:0 = Instant)	*00:00:00:0…***00:00:02:0**…01:49:13:5*

This parameter is used to determine the fade time for Switching Off action.

5.2.3 Master - Dimming Control

Dimming time for absolute dimming value input (0%...100%) (hh:mm:ss:f) (00:00:00:0 = Instant)	*00:00:00:0…***00:00:03:0**…01:49:13:5*

This parameter is used to determine the fade time for absolute dimming action.

Allow switching on via absolute dimming value	*No* ****Yes***

This parameter is used to allow switching ON the relevant output via absolute dimming object or not.

Allow switching off via absolute dimming value	*No* ****Yes***

This parameter is used to allow switching OFF the relevant output via absolute dimming object or not.

Dimming time for relative dimming control (0%...100%) (hh:mm:ss:f) (00:00:00:0 = Instant)	*00:00:00:0…***00:00:03:0**…01:49:13:5*

This parameter is used to determine the fade time for relative dimming control.

Allow switching on via relative dimming control	*No* ****Yes***

This parameter is used to allow switching ON the relevant output via relative dimming control or not.

Allow switching off via relative dimming control	*No* ****Yes***

This parameter is used to allow whether switching OFF the relevant output via relative dimming control or not.

5.2.4 Master – Feedback

Status Objects

Enable switching status object	*No* ***Yes**

This parameter is used to show switching status objects. Switching status objects will be visible, If selected "*Yes*".

Switching status sending mode	*Don't transmit* ***Transmit on change*** *Transmit always*

This parameter is used to select transmit type for switching status.

- Set the parameter to "*Transmit on change"*: The switching status will be transmitted when switching status changed.
- Set the parameter to "*Transmit always"*: The switching status will be transmitted regardless of switching state.
- Set the parameter to "*Don't transmit"*: The switching status will never be transmitted.

Enable dimming status object	*No* ***Yes**

This parameter is used to show dimming status objects. Dimming status objects will be visible, if selected "*Yes*".

Dimming status sending mode	*Don't transmit* ***Transmit on change*** *Transmit always*

This parameter is used to select transmit type for dimming status.

- Set the parameter to "*Transmit on change"*: The dimming status will be transmitted when dimming level changed.
- Set the parameter to "*Transmit always"*: The dimming status will be transmitted regardless of dimming level.
- Set the parameter to "*Don't transmit"*: The dimming status will never be transmitted.

Error Objects

Enable comm. object "Overcurrent Error"	***checked** *unchecked*

This parameter used to show Error Object in case of maximum current limit reaching.

Enable comm. object "Overvoltage Error"	***checked** *unchecked*

This parameter used to show Error Object in case of maximum voltage limit reaching.

Enable comm. object "Overheating Error"	***checked** *unchecked*

This parameter used to show Error Object in case of overheat of device.

Enable comm. object "Short/Open Circuit Error"	***checked** *unchecked*

This parameter used to show Error Object in case of short/open circuit on dimming outputs.

Enable comm. object "Hardware Error"	***checked** *unchecked*

This parameter used to show Error Object in case of switch-dim controller malfunction.

Measurement Objects

Enable comm. object "Current (rms) Measurement"	*no* ***yes**

This parameter is used to transmit the measured load current for each channel. Load current value unit is Ampere. (A)

Enable cyclic sending of Current (rms)	***no** *yes*

This parameter is used for transmitting the measured load current, cyclically If selected "yes".

Current (rms) sending period(hh:mm:ss)	***00:00:02**…18:12:15*

This parameter will be shown If cyclic sending of load current selected "yes".

Enable comm. object "Voltage (rms) Measurement"	*no* ***yes**

This parameter is used to transmit measured voltage for each channel. Measured voltage value unit is Volt. (V)

Enable cyclic sending of Voltage (rms)	***no** *yes*

This parameter is used for transmitting the measured voltage cyclically If selected "yes".

Voltage (rms) sending period(hh:mm:ss)	***00:00:02**…18:12:15*

This parameter will be shown If cyclic sending of load voltage selected "yes".

Enable comm. object "Mean Active Power Measurement"	*no* ***yes**

This parameter is used to transmit the measured load power for each channel. Load Power value unit is Watt. (W)

Enable cyclic sending of Mean Active Power	***no** *yes*

This parameter is used for transmitting the load power cyclically If selected "yes".

Mean Active Power *sending period(hh:mm:ss)*	***00:00:02**…18:12:15*

This parameter will be shown If cyclic sending of load power selected "yes".

Enable comm. object "Power Factor Measurement"	*no* ***yes**

This parameter is used to transmit the measured load power factor for each channel. The measure load power factor value unit is cosine phi. (cos θ)

5.2.5 Master - Forced Operation

Forced Operation Function	***1-bit format*** *2-bit format*

This parameter is used to select forced operation activation type. When Forced Operation is activated, any switching, dimming, staircase or scene commands will not affect to the relevant channel.

Dimming time for Forced Operation function (from 0% to 100%) (hh:mm:ss.f)	*00:00:00.0…***00:00:03.0…**01:49:13.5*

This parameter is used to determine transition time to reach Forced Dimming value.

Dimming value during Forced Operation	*0…***100%...**Force Current Value*

This parameter appears when *"Forced Operation Function = **1-bit format"*** is selected. It is used to select dimming value when Forced Operation is enabled.

- Set the parameter to *"Force Current Value"*: The device will block the current dimming value on the relevant channel until Forced Operation disabled.

Dimming value during Forced Position On	*0…***100%...**Force Current Value*

This parameter appears when *"Forced Operation Function = **2-bit format"*** is selected. It is used to select dimming value when Forced Operation is enabled.

- Set the parameter to *"Force Current Value"*: The device will block the current dimming value on the relevant channel until Forced Operation disabled.

Dimming value during Forced Operation Off	****0…**100%*

This parameter appears when *"Forced Operation Function = **2-bit format"*** is selected. It is used to select dimming value when Forced Operation is disabled.

5.2.6 Master - Staircase Function

Dimming value during Staircase On	*0…***100%***

This parameter is used to select dimming value for the relevant channel when Staircase function is triggered.

Dimming time for Staircase ON dimming value (from 0% to 100%) (hh:mm:ss.f)	*00:00:00.0…***00:00:01.5…**01:49:13.5*

This parameter determines the transition time to reach to dimming value when Staircase Function is activated.

Dimming time for Staircase Switch OFF dimming value (from 0% to 100%) (hh:mm:ss.f)	*00:00:00.0…***00:00:03.0…**01:49:13.5*

This parameter determines the transition time to reach to dimming value when Staircase Function is ended.

Staircase On time (hh:mm:ss)	*00:00:05…***00:00:10…**18:12:15*

This parameter determines the Staircase on time duration. Staircase lighting will be deactivated at the end of the time.

Enable Staircase Warning	****no*** *yes*

This parameter is used to enable/disable warning after end of the Staircase ON time.

Dimming value during Staircase Warning	*0…***50%...**100%*

This parameter is shown when "*Enable Staircase Warning: **yes**" selected. It is* used to select dimming value for the relevant channel when device is in Staircase Warning mode.

Dimming time for Staircase Warning dimming value (from 0% to 100%) (hh:mm:ss.f)	*00:00:00.0…***00:00:04.0…**01:49:13.5*

This parameter is shown when "*Enable Staircase Warning: **yes**" selected. It* is used to determine transition time to reach Staircase Warning Dimming Value when Staircase Function is disabled after end of the *Staircase On* time.

Staircase Warning time (hh:mm:ss)	*00:00:02…***00:00:05…**18:12:15*

This parameter is shown when "*Enable Staircase Warning: **yes**" selected. It* determines the Staircase Warning time duration. Staircase Warning will be deactivated at the end of the time.

Enable communication object "Staircase Permanent"	***no** *yes*

This parameter is used to enable/disable Permanent lighting while Staircase is in process. "Staircase Permanent" group object will be appeared when it is selected "yes". When the Staircase Permanent is activated by the group object, the desired Permanent Dimming Level will be applied. Switching, dimming and staircase trigger object values will be ignored but, Scene and Forced Operation can be activated while Staircase Permanent is ON.

Dimming value during Permanent ON	*0…***100%***

This parameter is shown when "*Enable communication object "Staircase Permanent: **yes**"* selected. It is used to select dimming value for the relevant channel when device is Permanent ON mode.

Dimming time for Permanent ON value (from 0% to 100%) (hh:mm:ss.f)	*00:00:00.0…***00:00:01.5…**01:49:13.5*

This parameter is shown when "*Enable communication object "Staircase Permanent: **yes**"* selected. It is used to determine transition time to reach to Permanent ON dimming value if triggered.

Re-trigger Staircase after Permanent ON disabling	*no* ****yes***

This parameter is shown when "*Enable communication object "Staircase Permanent: **yes**"* selected. It is used to select behavior of Staircase re-triggering after Permanent ON disabling.

5.2.7 Master - Faults

Mains Power Recovery

Dimming value after mains power recovery	***Status as prior to failure*** *0…100%*

This parameter is used to determine the dimming value when the mains power is recovered.

- *Status as prior to failure:* Channel dimming value will be set as before Mains Power Failure.

Forced Operation Status after mains power recovery	**** Status as prior to failure*** *Forced Operation disabled* *Forced Operation activated – Position On* *Forced Operation activated – Position Off*

This parameter is used to determine the Forced Operation status when the mains power is recovered.

- *Status as prior to failure:* Forced Operation status will be set as before Mains Power Failure on Mains Power Recovery.
- *Forced Operation disabled:* Forced Operation status will be de-activated after Mains Power Recovery.
- *Forced Operation activated – Position On:* Forced Operation status will be activated and the related channel output will be switched ON after Mains Power Recovery.
- *Forced Operation activated – Position Off:* Forced Operation status will be activated and the related channel output will be switched OFF after Mains Power Recovery

KNX Bus Failure

Dimming value after KNX bus failure	***Don't change*** *0…100%*

This parameter is used to determine the dimming value when KNX Bus Failure.

- ***Don't change*:** Channel dimming value will NOT be changed after KNX Bus Failure.

Forced Operation Status after KNX bus failure	**** Keep current status*** *Forced Operation disabled* *Forced Operation activated – Position On* *Forced Operation activated – Position Off*

This parameter is used to determine the Forced Operation status when KNX Bus Failure.

- *Keep current status*: Forced Operation status will not be changed after KNX Bus Failure.
- *Forced Operation disabled:* Forced Operation status will be de-activated after KNX Bus Failure.
- *Forced Operation activated – Position On:* Forced Operation status will be activated and the related channel output will be switched ON after KNX Bus Failure.
- *Forced Operation activated – Position Off:* Forced Operation status will be activated and the related channel output will be switched OFF after KNX Bus Failure.

KNX Bus Recovery

Dimming value after KNX bus recovery	***Don't change*** *Status as prior to failure* *0…100%*

This parameter is used to determine the dimming value when the KNX Bus recovered.

- *Don't change*: Channel dimming value will NOT be changed after KNX Bus Failure.
- *Status as prior to failure*: Channel dimming value will be set as before KNX bus Failure.

Forced Operation Status after KNX bus recovery	**** Status as prior to failure*** *Forced Operation disabled* *Forced Operation activated – Position On* *Forced Operation activated – Position Off*

This parameter is used to determine the Forced Operation status when the KNX bus recovered.

- *Status as prior to failure*: Forced Operation status will be set as before KNX bus Failure.
- *Forced Operation disabled:* Forced Operation status will be de-activated after KNX Bus Recovery.
- *Forced Operation activated – Position On:* Forced Operation status will be activated and the related channel output will be switched ON after KNX Bus Failure after KNX Bus Recovery.
- *Forced Operation activated – Position Off:* Forced Operation status will be activated and the related channel output will be switched OFF after KNX Bus Failure after KNX Bus Recovery.

5.2.8 Master - Dimming Curve

This function is used to create the dimming curves as desired. The dimming section time calculation is shown below.

$$[Dimming\ Section\ x\ Time] = [x\ Dimming\ Time] \times \frac{[Dimming\ Section\ x\ Time\ Factor]}{[Total\ SUM\ of\ Dimming\ Section\ Time\ Factors]}$$

"x Dimming Time" may vary depends on dimming control type.

e.g. 1= if it is desired to know the **"Dimming Section 3 Time"** while switching ON

Dimming time to Switch On value (From 0% to 100%) = 60 seconds

Dimming Section 1 Time Factor= 10

Dimming Section 2 Time Factor= 20
Dimming Section 2 Threshold (th2) = 25%

Dimming Section 3 Time Factor= 30
Dimming Section 3 Threshold (th3) =50%

Dimming Section 4 Time Factor= 40
Dimming Section 4 Threshold (th4) = 75%

Total SUM of Dimming Section Time Factors = 10 + 20 + 30 + 40

Total SUM of Dimming Section Time Factors = 100

$$[Dimming\ Section\ 3\ Time] = [60] \times \frac{[30]}{[100]} =$$
$$[Dimming\ Section\ 3\ Time] = 60 \times 0{,}3 = 18$$
$$[Dimming\ Section\ 3\ Time] = 18\ seconds$$

In this case, 18 seconds will be spent during dimming from 50% to 75% (via Switch ON command)

e.g. 2= if it is desired to know the **"Dimming Section 1 Time"** while dimming from 0 to 100%.

Calculation will be processed with the same values in the previous example except "Dimming time for absolute dimming".

Dimming time for absolute dimming value (from 0 to 100%)= 10 seconds

$$[Dimming\ Section\ 3\ Time] = [10] \times \frac{[10]}{[100]} =$$
$$[Dimming\ Section\ 3\ Time] = 10 \times 0{,}1 = 1$$
$$[Dimming\ Section\ 3\ Time] = 1\ second$$

In this case, 1 second will be spent during dimming from 0% to 25% while dimming from 0 to 100%.

Dimming Section 1 [0% - th2%]

Dimming Section 1 Time Factor	***1**…255*

This parameter defines the dimming section time factor between 0% and th2.

“th2” is selected as 25% default.

Dimming Section 2 [th2% - th3%]

Dimming Section 2 Threshold (th2)	*0…**25**…100 %*

This parameter is used to select threshold value for th2%.

Dimming Section 2 Time Factor	***1**…255*

This parameter defines the dimming time between th2 and th3.

“th2” is selected as 25% default.

“th3” is selected as 50% default.

Dimming Section 3 [th3% - th4%]

Dimming Section 3 Threshold (th3)	*0…**50**…100 %*

This parameter is used to select threshold value for th3%.

Dimming Section 3 Time Factor	***1**…255*

This parameter defines the dimming time between th3 and th4.

“th3” is selected as 50% default.

“th4” is selected as 75% default.

Dimming Section 4 [th4% - 100%]

Dimming Section 4 Threshold (th4)	*0…**75**…100 %*

This parameter is used to select threshold value for th4%.

Dimming Section 4 Time Factor	***1**…255*

This parameter defines the dimming time between th4 and 100%.

“th4” is selected as 75% default.

5.3 Channel A…E

5.3.1 Channel A…E - Dimming Settings

Parameter setting	***Take over from master*** *Individual*

This parameter is used to apply parameter settings from master or individually.

Dimming Method	*Trailing Edge Dimming* *Leading Edge Dimming* ***Auto detect based on the load type***

This parameter is used to select the dimming method based on light load.

- Set the parameter to “Trailing Edge Dimming”
  This selection is compatible with Trailing Edge driving loads.

- Set the parameter to “Leading Edge Dimming”
  This selection is compatible with Leading Edge driving loads.

- Set the parameter to “Auto detect based on the load type”
  This selection is enables automatic load type detection. Loads will be driven depending on load type.

Dimming Characteristic	***Linear*** *Logarithmic (LED)* *Incandescent Lamps* *Halogen Lamps* *Custom Dimming Curve*

This parameter is used to select dimming characteristic type.

- Set the parameter to “Linear”
  This selection allows the dimming proportionally.

- Set the parameter to “Logarithmic (LED)”
  This selection allows the dimming for LEDs. (small load)

- Set the parameter to “Incandescent Lamps”
  This selection allows the dimming for Incandescent lamps.

- Set the parameter to “Halogen Lamps”
  This selection allows the dimming for Halogen lamps.

- Set the parameter to “Custom Dimming Curve”
  This selection allows the dimming for desired curve for any other specific light loads. And, Dimming Curve parameter tab will be appeared.

Maximum dimming percentage	*0… ***100***

This parameter is used to select maximum dimming level.

Minimum dimming percentage	****0**… 100*

This parameter is used to select minimum dimming level.

5.3.2 Channel A…E – Switching

Parameter setting	***Take over from master*** *Individual*

This parameter is used to apply parameter settings from master or individually.

Switching On dimming value	*0… ***100**…Last Value*

This parameter is used to select the dimming level when the relevant output is activated through using Switching object.

- Set the parameter to “Last value”
  This selection is used to dim the relevant output through using the saved light level before switched OFF.

Dimming time to Switch On value (0%...100%) (hh:mm:ss:f) (00:00:00:0 = Instant)	*00:00:00:0…***00:00:02:0**…01:49:13:5*

This parameter is used to determine the fade time for Switching On action.

Dimming time to Switch Off value (100%...0%) (hh:mm:ss:f) (00:00:00:0 = Instant)	*00:00:00:0…***00:00:02:0**…01:49:13:5*

This parameter is used to determine the fade time for Switching Off action.

5.3.3 Channel A…E - Dimming Control

Parameter setting	***Take over from master*** *Individual*

This parameter is used to apply parameter settings from master or individually.

Dimming time for absolute dimming value input (0%...100%) (hh:mm:ss:f) (00:00:00:0 = Instant)	*00:00:00:0…**00:00:03:0**…01:49:13:5*

This parameter is used to determine the fade time for absolute dimming action.

Allow switching on via absolute dimming value	*No* ***Yes***

This parameter is used to allow switching ON the relevant output via absolute dimming object or not.

Allow switching off via absolute dimming value	*No* ***Yes***

This parameter is used to allow switching OFF the relevant output via absolute dimming object or not.

Dimming time for relative dimming control (0%...100%) (hh:mm:ss:f) (00:00:00:0 = Instant)	*00:00:00:0…**00:00:03:0**…01:49:13:5*

This parameter is used to determine the fade time for relative dimming control.

Allow switching on via relative dimming control	*No* ***Yes***

This parameter is used to allow switching ON the relevant output via relative dimming control or not.

Allow switching off via relative dimming control	*No* ***Yes***

This parameter is used to allow switching OFF the relevant output via relative dimming control or not.

5.3.4 Channel A…E - Feedback

Parameter setting	***Take over from master*** *Individual*

This parameter is used to apply parameter settings from master or individually.

Status Objects

Enable switching status object	*No* ***Yes***

This parameter is used to show switching status objects. Switching status objects will be visible, If selected "*Yes*".

Switching status sending mode	*Don't transmit* ***Transmit on change*** *Transmit always*

This parameter is used to select transmit type for switching status.

- Set the parameter to "*Transmit on change"*: The switching status will be transmitted when switching status changed.
- Set the parameter to "*Transmit always"*: The switching status will be transmitted regardless of switching state.
- Set the parameter to "*Don't transmit"*: The switching status will never be transmitted.

Enable dimming status object	*No* ***Yes***

This parameter is used to show dimming status objects. Dimming status objects will be visible, If selected "*Yes*".

Dimming status sending mode	*Don't transmit* ***Transmit on change*** *Transmit always*

This parameter is used to select transmit type for dimming status.

- Set the parameter to "*Transmit on change"*: The dimming status will be transmitted when dimming level changed.
- Set the parameter to "*Transmit always"*: The dimming status will be transmitted regardless of dimming level.
- Set the parameter to "*Don't transmit"*: The dimming status will never be transmitted.

Error Objects

Enable comm. object "Overcurrent Error"	***checked** *unchecked*

This parameter used to show Error Object in case of maximum current limit reaching.

Enable comm. object "Overvoltage Error"	***checked** *unchecked*

This parameter used to show Error Object in case of maximum voltage limit reaching.

Enable comm. object "Overheating Error"	***checked** *unchecked*

This parameter used to show Error Object in case of overheat of device.

Enable comm. object "Short/Open Circuit Error"	***checked** *unchecked*

This parameter used to show Error Object in case of short/open circuit on loads.

Enable comm. object "Hardware Error"	***checked** *unchecked*

This parameter used to show Error Object in case of switch-dim controller malfunction.

Measurement Objects

Enable comm. object "Current (rms) Measurement"	*no* ***yes**

This parameter is used to transmit the measured load Current for each channel. Load Current value unit is Ampere. (A)

Enable cyclic sending of Current (rms)	***no** *yes*

This parameter is used for transmitting the load Current cyclically If selected "yes".

Current (rms) sending period(hh:mm:ss)	***00:00:02**…18:12:15*

This parameter will be shown If cyclic sending of load Current selected "yes".

Enable comm. object "Voltage (rms) Measurement"	*no* ***yes**

This parameter is used to transmit the measured Voltage for each channel. Load Voltage value unit is Volt. (V)

Enable cyclic sending of Voltage (rms)	***no** *yes*

This parameter is used for transmitting the load Voltage cyclically If selected "yes".

Voltage (rms) sending period(hh:mm:ss)	***00:00:02**…18:12:15*

This parameter will be shown If cyclic sending of load Voltage selected "yes".

Enable comm. object "Mean Active Power Measurement"	*no* ***yes**

This parameter is used to transmit the measured load Power for each channel. Load Power value unit is Watt. (W)

Enable cyclic sending of Mean Active Power	***no** *yes*

This parameter is used for transmitting the load Power cyclically If selected "yes".

Mean Active Power *sending period(hh:mm:ss)*	***00:00:02**…18:12:15*

This parameter will be shown If cyclic sending of load Power selected "yes".

Enable comm. object "Power Factor Measurement"	*no* ***yes**

This parameter is used to transmit the measured load Power Factor for each channel. Power Factor value unit is Cosine Phi. (cos θ)

5.3.5 Channel A…E - Forced Operation

Forced Operation function	***Disabled*** *Active (1-bit format)* *Active (2-bit format)* *Active (Use master parameters)*

This parameter is used to enable/disable the Forced Operation via getting settings from master parameter or individually.

Dimming time for Forced Operation function (from 0% to 100%) (hh:mm:ss.f)	*00:00:00.0…**00:00:03.0…**01:49:13.5*

This parameter is used to determine transition time to reach Forced Dimming value.

Dimming value during Forced Operation	*0…**100%...**Force Current Value*

This parameter appears when *"Forced Operation Function = **1-bit format"*** is selected. It is used to select dimming value when Forced Operation is enabled.

- Set the parameter to *"Force Current Value"*: The device will block the current dimming value on the relevant channel until Forced Operation disabled.

Dimming value during Forced Position On	*0…**100%...**Force Current Value*

This parameter appears when *"Forced Operation Function = **2-bit format"*** is selected. It is used to select dimming value when Forced Operation is enabled.

- Set the parameter to *"Force Current Value"*: The device will block the current dimming value on the relevant channel until Forced Operation disabled.

Dimming value during Forced Operation Off	***0…100%**

This parameter appears when *"Forced Operation Function = **2-bit format"*** is selected. It is used to select dimming value when Forced Operation is disabled.

5.3.6 Channel A…E - Staircase Function

Staircase function	***Disabled*** *Enabled (Individual parameters)* *Enabled (Use master parameters)*

This parameter is used to enable/disable the Staircase function via getting settings from master parameter or individually.

If the "*Enabled (Use master parameters)"* is selected, Master Channel Parameters > Staircase Function parameters will be processed.

If the "*Enabled (Individual parameters)"* is selected, related parameters will be shown below.

Dimming value during Staircase On	*0…**100%***

This parameter is used to select dimming value for the relevant channel when Staircase function is triggered.

Dimming time for Staircase ON dimming value (from 0% to 100%) (hh:mm:ss.f)	*00:00:00.0…**00:00:01.5…01:49:13.5*

This parameter determines the transition time to reach to dimming value when Staircase Function is ended.

Dimming time for Staircase Switch OFF dimming value (from 0% to 100%) (hh:mm:ss.f)	*00:00:00.0…**00:00:03.0…01:49:13.5*

This parameter determines the transition time to reach to dimming value when Staircase Function is ended.

Staircase On time (hh:mm:ss)	*00:00:05…**00:00:10…18:12:15*

This parameter determines the Staircase on time duration. Staircase lighting will be deactivated at the end of the time.

Enable Staircase Warning	***no*** *yes*

This parameter is used to enable/disable warning after end of the staircase function.

Dimming value during Staircase Warning	*0…**50%...100%*

This parameter is shown when *"Enable Staircase Warning: **yes**" selected. It is* used to select dimming value for the relevant channel when device is in Staircase Warning mode.

Dimming time for Staircase Warning dimming value (from 0% to 100%) (hh:mm:ss.f)	*00:00:00.0…***00:00:04.0…**01:49:13.5*

This parameter is shown when "*Enable Staircase Warning: **yes**" selected. It* is used to determine transition time to reach Staircase Warning Dimming Value when Staircase Function is disabled after end of the *Staircase On* time.

Staircase Warning time (hh:mm:ss)	*00:00:02…***00:00:05…**18:12:15*

This parameter is shown when "*Enable Staircase Warning: **yes**" selected. It* determines the Staircase Warning time duration. Staircase Warning will be deactivated at the end of the time.

Enable communication object "Staircase Permanent"	****no*** *yes*

This parameter is used to enable/disable Permanent lighting while Staircase is in process. "Staircase Permanent" group object will be appeared when it selected "yes". When the Staircase Permanent is activated by the group object, the desired Permanent Dimming Level will be applied. Switching, dimming and staircase trigger object values will be ignored but, Scene and Forced Operation can be activated while Staircase Permanent is ON.

Dimming value during Permanent ON	*0…***100%***

This parameter is shown when "*Enable communication object "Staircase Permanent: **yes**"* selected. It is used to select dimming value for the relevant channel when device is Permanent ON mode.

Dimming time for Permanent ON value (from 0% to 100%) (hh:mm:ss.f)	*00:00:00.0…***00:00:01.5…**01:49:13.5*

This parameter is shown when "*Enable communication object "Staircase Permanent: **yes**"* selected. It is used to determine transition time to reach to Permanent ON dimming value if triggered.

Re-trigger Staircase after Permanent ON disabling	*no* ****yes***

This parameter is shown when "*Enable communication object "Staircase Permanent: **yes**"* selected. It is used to select behavior of Staircase re-triggering after Permanent ON disabling.

5.3.7 Channel A…E – Faults

Parameter setting	***Take over from master*** *Individual*

This parameter is used to select the channel parameter settings from master or individually.

Mains Power Recovery

Dimming value after mains power recovery	***Status as prior to failure*** *0…100%*

This parameter is used to determine the dimming value when the mains power is recovered.

- *Status as prior to failure*: Channel dimming value will be set as before Mains Power Failure in case of Mains Power Recovery.

Forced Operation Status after mains power recovery	**** Status as prior to failure*** *Forced Operation disabled* *Forced Operation activated*

This parameter will be shown, if the **Forced Operation** is activated as **1 bit** in the "Channel A/B/C/D/E" parameters. It is used to determine the Forced Operation status when the mains power is recovered.

- *Status as prior to failure:* Forced Operation status will be set as before Mains Power Failure on Mains Power Recovery.
- *Forced Operation disabled:* Forced Operation status will be de-activated after Mains Power Recovery.
- *Forced Operation activated:* Forced Operation status will be activated after Mains Power Recovery.

Forced Operation Status after mains power recovery	**** Status as prior to failure*** *Forced Operation disabled* *Forced Operation activated – Position On* *Forced Operation activated – Position Off*

This parameter will be shown, if the **Forced Operation** is activated as **2 bits** in the "Channel A/B/C/D/E" parameters. It is used to determine the Forced Operation status when the mains power is recovered.

- *Status as prior to failure:* Forced Operation status will be set as before Mains Power Failure in case of Mains Power Recovery.
- *Forced Operation disabled:* Forced Operation status will be de-activated after Mains Power Recovery.
- *Forced Operation activated – Position On:* Forced Operation status will be activated and the related channel output will be switched ON after Mains Power Recovery.
- *Forced Operation activated – Position Off:* Forced Operation status will be activated and the related channel output will be switched OFF after Mains Power Recovery

KNX Bus Failure

Dimming value after KNX bus failure	***Don't change*** *0…100%*

This parameter is used to determine the dimming value when KNX Bus Failure.

- *Don't change*: Channel dimming value will NOT be changed after KNX Bus Failure.

Forced Operation Status after KNX bus failure	**** Keep current status*** *Forced Operation disabled* *Forced Operation activated – Position On* *Forced Operation activated – Position Off*

This parameter will be shown, if the **Forced Operation** is activated as **1 bit** in the "Channel A/B/C/D/E" parameters. It is used to determine the Forced Operation status when KNX Bus Failure.

- *Keep current status***:** Forced Operation status will not be changed after KNX Bus Failure.
- *Forced Operation disabled:* Forced Operation status will be de-activated after KNX Bus Failure.
- *Forced Operation activated:* Forced Operation status will be activated and the related channel output will be switched ON after KNX Bus Failure.

Forced Operation Status after KNX bus failure	**** Keep current status*** *Forced Operation disabled* *Forced Operation activated – Position On* *Forced Operation activated – Position Off*

This parameter will be shown, if the **Forced Operation** is activated as **2 bits** in the "Channel A/B/C/D/E" parameters. It is used to determine the Forced Operation status when KNX Bus Failure.

- *Keep current status***:** Forced Operation status will not be changed after KNX Bus Failure.
- *Forced Operation disabled:* Forced Operation status will be de-activated after KNX Bus Failure.
- *Forced Operation activated – Position On:* Forced Operation status will be activated and the related channel output will be switched ON after KNX Bus Failure.
- *Forced Operation activated – Position Off:* Forced Operation status will be activated and the related channel output will be switched OFF after KNX Bus Failure.

KNX Bus Recovery

Dimming value after KNX bus recovery	***Don't change*** *Status as prior to failure* *0…100%*

This parameter is used to determine the dimming value when the KNX Bus recovered.

- ***Don't change*:** Channel dimming value will NOT be changed after KNX Bus Failure.
- ***Status as prior to failure*:** Channel dimming value will be set as before KNX bus Failure.

Forced Operation Status after KNX bus recovery	**** Status as prior to failure*** *Forced Operation disabled* *Forced Operation activated – Position On* *Forced Operation activated – Position Off*

This parameter is used to determine the Forced Operation status when the KNX bus recovered.

- ***Status as prior to failure*:** Forced Operation status will be set as before KNX bus Failure.

5.3.8 Channel A…E - Dimming Curve

This parameter tab will be shown, If the Dimming characteristic is selected as “Custom Dimming Curve” in “Dimming Settings”. (see 5.3.1)

Parameter setting	***Take over from master*** *Individual*

This parameter is used to apply parameter settings from master or individually.

Dimming Curve is used for creating the customizable dimming curves. Dimming Section time calculation is shown below.

$$[Dimming\ Section\ x\ Time] = [x\ Dimming\ Time] \times \frac{[Dimming\ Section\ x\ Time\ Factor]}{[Total\ SUM\ of\ Dimming\ Section\ Time\ Factors]}$$

“x Dimming Time” may vary depends on dimming control type.

e.g. 1= if it is desired to know the **“Dimming Section 3 Time“** while switching ON

Dimming time to Switch On value (From 0% to 100%) = 60 seconds

Dimming Section 1 Time Factor= 10

Dimming Section 2 Time Factor= 20
Dimming Section 2 Threshold (th2) = 25%

Dimming Section 3 Time Factor= 30
Dimming Section 3 Threshold (th3) =50%

Dimming Section 4 Time Factor= 40
Dimming Section 4 Threshold (th4) = 75%

Total SUM of Dimming Section Time Factors = 10 + 20 + 30 + 40

Total SUM of Dimming Section Time Factors = 100

$$[Dimming\ Section\ 3\ Time] = [60] \times \frac{[30]}{[100]} =$$
$$[Dimming\ Section\ 3\ Time] = 60 \times 0{,}3 = 18$$
$$[Dimming\ Section\ 3\ Time] = 18\ seconds$$

In this case, 18 seconds will be spent during dimming from 50% to 75% (via Switch ON command)

e.g. 2= if it is desired to know the **"Dimming Section 3 Time"** while absolute dimming from 0 to 100%.

Calculation will be processed with the same parameters in the previous example except "Dimming time for absolute dimming".

Dimming time for absolute dimming value (from 0 to 100%) = 10 seconds

$$[Dimming\ Section\ 3\ Time] = [10] \times \frac{[30]}{[100]} =$$
$$[Dimming\ Section\ 3\ Time] = 10 \times 0{,}3 = 3$$
$$[Dimming\ Section\ 3\ Time] = 3\ seconds$$

In this case, 3 seconds will be spent during dimming between 50% and 75% (via absolute brightness control command)

Dimming Section 1 [0% - th2%]

Dimming Section 1 Time Factor	***1**…255*

This parameter defines the dimming section time factor between 0% and th2.

“th2” is selected as 25% default.

Dimming Section 2 [th2% - th3%]

Dimming Section 2 Threshold (th2)	*0…**25**…100 %*

This parameter is used to select threshold value for th2%.

Dimming Section 2 Time Factor	***1**…255*

This parameter defines the dimming time between th2 and th3.

“th2” is selected as 25% default.

“th3” is selected as 50% default.

Dimming Section 3 [th3% - th4%]

Dimming Section 3 Threshold (th3)	*0…**50**…100 %*

This parameter is used to select threshold value for th3%.

Dimming Section 3 Time Factor	***1**…255*

This parameter defines the dimming time between th3 and th4.

“th3” is selected as 50% default.

“th4” is selected as 75% default.

Dimming Section 4 [th4% - 100%]

Dimming Section 4 Threshold (th4)	*0…**75**…100 %*

This parameter is used to select threshold value for th4%.

Dimming Section 4 Time Factor	***1**…255*

This parameter defines the dimming time between th4 and 100%.

“th4” is selected as 75% default.

5.4 Scenes

The scene function of the switch & dim actuator has an 8-bit scene object (DPT 18.001 scene control). You can define 64 scenes on parameter window. A scene can be specified with brightness value and transition time to new brightness.

A scene is activated when object receives a scene number. Saving current channel values as a scene is carried out using the same scene object.

For example;

Scene	recall		save	
	Hex.	Des.	Hex.	Des.
1	0x00	0	0x80	128
2	0x01	1	0x81	129
3	0x02	2	0x82	130
4	0x03	3	0x83	131
5	0x04	4	0x84	132
6	0x05	5	0x85	133
7	0x06	6	0x86	134
8	0x07	7	0x87	135
9	0x08	8	0x88	136
10	0x09	9	0x89	137
11	0x0A	10	0x8A	138
…	…	…	…	…
63	0x3E	62	0xE2	190
64	0x3F	63	0xE3	191

Scene configuration

Scene 1…64	***Not used*** *1….64*

This parameter is used to select following parameters belongs to which scene. "*Not used*" meaning following parameters do not belong to any scene.

Scene 1…64

Dimming time to scene values (From 0% to 100%) (hh:mm:ss.f)	*00:00:00…**00:00:03.0**…01:49:13.5*

This parameter defines the transition time of dimming. This parameter defines the dimming time between 0% to 100%. Scene dimming time calculating example shown below;

e.g. Transition time to new brightness= 3 sec
Scene Brightness value= % 25
Current Brightness value= % 60

$$Scene\ Dimming\ Time = \left(\frac{Transition\ time\ to\ new\ brightness}{100}\right) \times |Scene\ Brightness\ Value - Current\ Brightness\ value|$$

The result is = (3/100) x l 25-60 l

=0,03 x l-35l

=0,03 x 35

=1,05 sec

Overwrite scene values on download	***checked*** *unchecked*

This parameter is used to select overwriting scenes values via ETS Download.

Channel A…E scene value	***Don't change (Not a part of this scene)*** *0…100%*

This parameter is used to select dim value or availability for each channel in related scene.

6. Object Descriptions

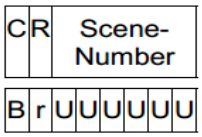
6.1 General Object Description

No	Object name	Name	DP Type	Length	Flags
0	In operation	General	DPT 1.002	1 bit	CRT
This object will be used to report that device still alive and contacted the KNX line. Telegram value can be selected as ON or OFF. If a telegram is not received in a period time, device may be defective or KNX cable interrupted. The object value will be sent to the line, cyclically.					

6.2 Input - Output Object Description

No	Object name	Name	DP Type	Length	Flags
1	Scene Control Input	General	DPT 18.001	1 byte	CWU

This object is used to recall or store scenes. Up to 64 scenes are available.
8-bit scenes are stored in the device persistent memory.



C: 0 – recall scene
1 – store scene
R: Reserved

Scene	recall		save	
	Hex.	Des.	Hex.	Des.
1	0x00	0	0x80	128
2	0x01	1	0x81	129
3	0x02	2	0x82	130
4	0x03	3	0x83	131
5	0x04	4	0x84	132
6	0x05	5	0x85	133
7	0x06	6	0x86	134
8	0x07	7	0x87	135
9	0x08	8	0x88	136
10	0x09	9	0x89	137
11	0x0A	10	0x8A	138
...	...	...	...	...
63	0x3E	62	0xE2	190
64	0x3F	63	0xE3	191

2	Switch	Output A...E	DPT 1.001	1 bit	CWU

This object is used for switching an output ON/OFF.

0: Switch OFF
1: Switch ON

3	Status switch	Output A...E	DPT 1.001	1 bit	CRT

This object is used to transmit the current switch position of the related output.

0: Channel Switched OFF
1: Channel Switched ON

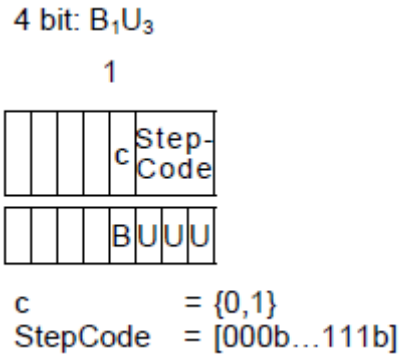
No	Object name	Name	DP Type	Length	Flags
4	Absolute Dimming	Output A...E	DPT 5.001	1 byte	CWU

The brightness value is received via this object for relevant channel. The transition time is configured in “Value” parameter window. Brightness value is following the parameterized value with the limitation. Brightness value status can be sent via “Status brightness value” and “Status switch” objects.

0 : OFF, or min brightness value
255 : 100 %

5	Relative dimming	Output A...E	DPT 3.007	4 bit	CRWTU

The dimming telegrams are received via the group address linked with this object. The dimming parameterized speed and the limits are configured in “Dimming” parameter window. A stop command will stop dimming transition on current brightness value. This object is always visible.



c	Increase or decrease the brightness	0 = Decrease 1 = Increase
StepCode	The number of intervals into which the range of 0 % ... 100 % is subdivided or the break indication.	- 001b ... 111b: Step Number of intervals = $(2)^{(stepcode-1)}$ - 000b : Break

6	Dimming Status	Output A...E	DPT 5.001	1 byte	CRT

This object is used to transmit the current dimming level of the related output.

0 : OFF, or min brightness value
255 : 100 %

7	Forced operation	Output A...E	DPT 1.003	1bit	CWU
			DPT 2.001	2 bit	CWU

This object is used to set the brightness value of the output which is directly determined by this object and also blocks the channel for any other control. The brightness value is set to parameterized position in “Function” window. Forced operation has the highest priority.

Bit Field		Description		
Bit 0	:	Switching state	“0”: switching off	“1”: switching on
Bit 1	:	Forced control	“0”: inactive	“1”: active

No	Object name	Name	DP Type	Length	Flags
8	Forced Operation Status	Output A...E	DPT 1.003	1 bit	CRT
This object is used to show status of Forced Operation. 0 : Forced Operation is Disabled 1 : Forced Operation is Enabled					
9	Staircase Trigger	Output A...E	DPT 1.001	1 bit	CWU
This object is used to activate / de-activate the staircase function. 0 = Staircase Switch OFF 1 = Staircase Switch ON					
10	Staircase Permanent On	Output A...E	DPT 1.003	1 bit	CWU
This object is used to mask the Staircase function. If the Permanent ON object is set to Enable, the staircase function will be stopped and Permanent ON dimming value will be applied. If the Permanent ON object is disabled, Staircase function will be re-triggered or queued function will be processed. NOTE: “Re-trigger Staircase after Permanent On disabled” function must be selected “Yes” on Staircase Function parameter page. (see 5.2.6) After bus voltage return, the object will be deactivated. 0 = Permanent ON Disable 1 = Permanent ON Enable					

6.3 Error Objects

No	Object name	Name	DP Type	Length	Flags
11	Overcurrent Error	Error Output A…E	DPT 1.011	1 bit	CRT
This object sends the “1” value when the current limit(max 1.8 A) is exceeded on the related dimming output. Device also will shut down the output immediately. The device must be rebooted manually to work properly again. NOTE: The device won’t send “0” value automatically while it is working properly. Read request only. 0: No Error 1: Error					
12	Overvoltage Error	Error Output A…E	DPT 1.011	1 bit	CRT
This object sends the “1” value when the voltage limit(max 265V AC) is exceeded on the related dimming output. Device will switch OFF the output, immediately. When the line voltage is decreased from max voltage limit, the device will start working automatically and device will send “0” value from this object. 0: No Error 1: Error					
13	Overheating Error	Error Output A…E	DPT 1.011	1 bit	CRT
This object sends the “1” value while device getting heat due to lamp driving. The device will switch OFF the output immediately. The device must be rebooted manually to work properly again. NOTE: The device won’t send “0” value automatically while it is working properly. Read request only. 0: No Error 1: Error					
14	Hardware Error	Error Output A…E	DPT 1.011	1 bit	CRT
This object sends the “1” value in case of dimming hardware failure. Device also will shut down the output immediately. Device must be rebooted to work properly again. If error persists after reboot, the device may be broken. NOTE: The device won’t send “0” value automatically while it is working properly. Read request only. 0: No Error 1: Error					
15	Short/Open Circuit Error	Error Output A…E	DPT 1.011	1 bit	CRT
This object sends the “1” value and the device also will shut down the output immediately, if dimming output get short or open circuit. Device needs to be rebooted to work properly again. NOTE: If the dimming output power consuming is lower than 1 Watt, the device will consider this as Open-Circuit. NOTE: The device won’t send “0” value automatically while it is working properly. Read request only. 0: No Error 1: Error					

6.4 Measurement Objects

No	Object name	Name	DP Type	Length	Flags
16	Current (rms)	Error Output A...E	DPT 14.019	4 bytes	CRT
This object sends the measured load current for the related output. Value unit is Ampere (A)					
17	Voltage (rms)	Error Output A...E	DPT 14.027	4 bytes	CRT
This object sends the measured load voltage for the related output. Value unit is Volt (V)					
18	Mean Active Power	Error Output A...E	DPT 14.056	4 bytes	CRT
This object sends the measured load power for the related output. Value unit is Watt (W)					
19	Power Factor	Error Output A...E	DPT 14.057	4 bytes	CRT
This object sends the measured load power factor for the related output. Value unit is Cosine Phi (cos θ)					