07 B0 A2 Dimmer 983901

Use of the application program

Product family: Lighting
Product type: Dimmer
Manufacturer: Siemens

Name: Universal dimmer N 528D01
Description: Universal dimmer, 2 x 300 VA, AC 230 V
Order no: 5WG1 528-1DB01

Contents overview

07 B0 A2 Dimmer 983901

1 Functional description

The universal dimmer is a 4 MU-wide device for DIN-rail mounting with N-system dimensions. It is designed for lighting control, i.e. for switching and dimming resistive, inductive or capacitive loads ranging up to 300 VA with 230V AC, 50-60 Hz per output.

The bus is connected via a bus terminal block.
The device electronics are supplied via the bus voltage.

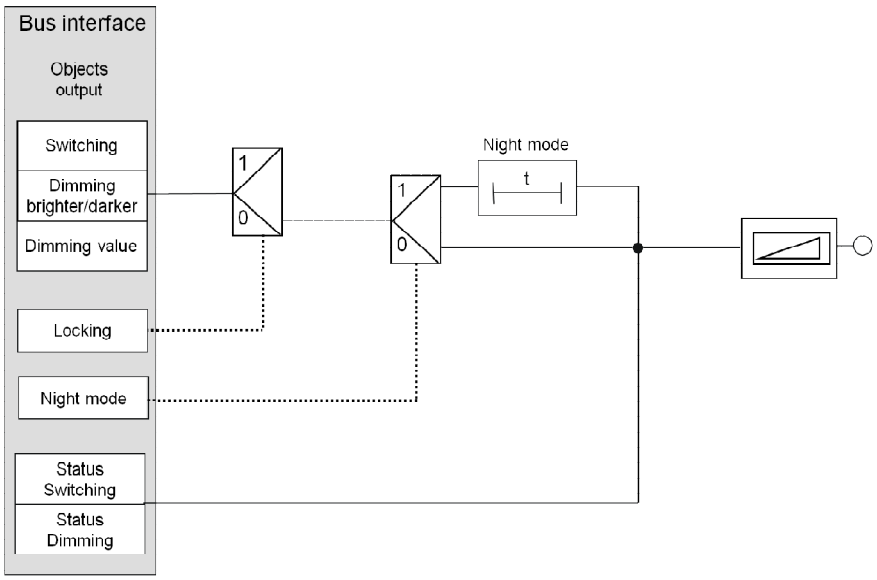
The device can be connected with loads on two outputs or for a higher load only with one output.

The device can be commissioned by Engineering Tool Software (ETS) version 4.0 or higher.
The application program "07 B0 A2 Universal dimmer 983901" or a newer version can be used.

The actuator output may be set to one of the following operating modes:
- Normal mode
- 1-level time switch mode
- 2-level time switch mode
- Flashing

Dependent on the selected operating mode, objects for the functions switching, dimming brighter / darker and dimming value are available for the actuator output.
Furthermore, if required, time-limited switching instead of permanent switching on can be enabled for each channel via an optional "Night mode" object (e.g. for lighting while cleaning), if need be with a warning before switching off by multiple switching the output on and off (flashing).

Dependent on the configuration, additional objects are available for the output channel for the functions locking and status request.
The following schema shows the named features in a logical overview.



Schematic design of a dimming actuator channel

The application program includes optional a switching cycle and power-on / operating hours count with threshold monitoring for each output and an integrated 8-bit scene control, in which each output can be incorporated into up to 8 scenes.

07 B0 A2 Dimmer 983901

1.1 Switching on / off

When a switching "ON" telegram is received, a parameter determines if the output channel is set to a preset dimming value, the dimming value on switching off or the last received dimming value. Switching "OFF" telegrams always result in switching the channel off. A parameter determines whether the output channel jumps to the preset switching on value respectively to the off value 0% or in what time it will be dimmed to the relevant value.

1.2 Dimming brighter / darker

The dimming time from 0% to 100% is set via a parameter. On receiving a start dimming command the actuator channel changes the brightness in the desired direction with the speed configured for dimming brighter/darker. If a stop command is received before the dimming action is completed, then dimming is stopped and the dimming value reached is maintained. Another parameter determines if the output can be switched on or off via dimming brighter / darker.

1.3 Dimming value (8 bit)

Via the object "A, Dimming value" the channel output can be set to the received dimming value. It is configurable, whether the channel output jumps to the dimming value respectively in what time it will be dimmed to the relevant value. Another parameter determines if and under which conditions the output can be switched on or off via dimming value.

1.4 Status Switching (1 bit)

A parameter in the parameter window „Functions, Objects" determines if an object is available for the channel to read the current switching status of the channel and/or automatically send the status on change of value.

1.5 Status dimming value (8 bit)

A parameter in the parameter window „Functions, Objects" determines if an object is available for the channel to read the current dimming value of the channel and/or automatically send the dimming value on change of value. To limit the number of telegrams generated by dimming brighter/darker, the period between two dimming value status telegrams can be set via the parameter "Delay status objects".

1.6 Minimum dimming value

A minimum dimming value can be configured. When dimming darker the channel can only be dimmed to the configured minimum value. Further dimming darker only results in turning the channel off if this is enabled via the configuration.
If a dimming value lower than the minimum dimming value is received, the channel is only dimmed darker to the minimum dimming value. If the value "0" is received, the lighting is turned off, if this is enabled by the configuration.

1.7 Maximum dimming value

The configurable maximum dimming value for the channel can be used to limit the dimming range, The maximum dimming value cannot be exceeded by dimming brighter or by a received dimming value that is higher than the maximum value.

1.8 Night mode (time-limited lighting for cleaning)

Night mode can be enabled respectively disabled via an optionally selectable object (1 bit). If night mode is enabled for the channel then the channel can only be switched on for a limited time (time-limited lighting for cleaning). If night mode is enabled or disabled, then the dimming value of the channel is left unchanged. The timer period for night mode is configured via a parameter.

1.9 Warning before switch-off

The parameter with the same name in the parameter window "Functions, Objects" determines whether the channel, when operating in night mode or 1-level time switch mode, shall signal an imminent automatic switching off about 30 seconds before timeout of the configured "on" period by reducing the brightness (dimming to 50% of the current value). This is to warn the room user and allow him to operate the light switch and thus extend the "on" period by the configured value before the lighting is turned off and leaves him in the dark.

07 B0 A2 Dimmer 983901

1.10 8-bit scene control

The parameter with the same name in the parameter window "Functions, Objects" determines whether the 8-bit scene control in the actuator is enabled for the channel. If it is enabled, a communication object "8-bit scene" and a parameter window "8-bit scenes" are added. Via the parameter window "8-bit scenes" the channel can be incorporated individually in up to 8 scenes.

1.11 Protection against short-circuit

In a short-circuit condition the dimmer turns the load off for 3 seconds and automatically tries to switch the output on to the currently set dimming value. If the short-circuit condition still persists the output is turned off permanently.
Turn the output on again by receiving a telegram "on" or dimming value >0.

1.12 Protection against over temperature / overload

In case the maximum permissible temperature is exceeded, which also can indicate an overload, the dimmer turns off immediately. If after 1 minute the dimmer has cooled down sufficiently, it automatically dims back to the currently set dimming value, if there was received a telegram turn "on" or a dimming value > 0.

1.13 Immunity to ripple control signals and electrical grid frequency fluctuations

In the ex-factory settings the influence of ripple control signals is compensated to reduce flickering of the lamp. This measure increases the influence of electrical grid frequency fluctuations on the brightness of the lamp.
A mostly undisturbed operation for an electrical system without a synchronous connection to the electrical grid (islanding) can be achieved when the ripple control compensation is disabled via the associated parameter. The dimmer becomes less sensible to frequency fluctuations in the electrical system. Yet, ripple control signals will lead to an increased flickering of the load.

1.14 Behavior on bus voltage failure / recovery

On bus voltage failure the current switching status and dimming values are saved for restoration on bus voltage recovery.
On bus voltage recovery the configured actions are executed and, if applicable, new status values are reported.

1.15 Building site function

The building site function provided ex-factory enables switching the building site lighting on and off via bus wall switches and actuators, even if these devices have not yet been commissioned with ETS.

1.16 Behavior on unloading the application program

When the application program is unloaded with ETS the device does not function.

1.17 Programming mode

A short press of the learning button (< 2 s) enables the programming mode. This is indicated by the programming key (LED). An additional press disables the programming mode.

Note:
A long press of the learning button (> 5 s to 20 s) enables the connection test for commissioning with Desigo. This mode will be disabled by an additional short press of the learning button.

1.18 Resetting the device to factory default settings

A very long push of the programming button (> 20 s) effects a reset to factory settings. This is indicated by constant flashing for 8 seconds.
All configuration settings are lost. The building site function is re-activated.

07 B0 A2 Dimmer 983901

2 Communication objects

Maximum number of group addresses: 127
Maximum number of assignments: 127

Note

The number and names of communication objects visible can vary depending on the parameter settings.

The application program already has been loaded in the factory.

The device is configured and commissioned with Engineering Tool Software (ETS) version ETS4 or higher.
With the ETS (Engineering Tool Software) the specific parameters and addresses are assigned appropriately, and downloaded into the device.

The following list shows all objects of the device.
Which objects are visible and linkable to group addresses is defined via the functions assigned to the inputs.
The objects and associated parameter settings are described with the functions.

Nr.	Object name	Function	Length	DPT	Flags
1	A, 8-bit scene	recall / save	1 byte	17.001	CW
2	A, Locking	On / Off	1 bit	1.003	CW
3	A, Night mode	On / Off	1 bit	1.003	CW
4	A, Switching	On / Off	1 bit	1.001	CW
5	A, Dimming	brighter / darker	4 bit	3.007	CW
6	A, Dimming value	8-bit value	1 byte	5.001	CW
8	A, Status switching	On / Off	1 bit	1.001	CRT
9	A, Status dimming value	8-bit value	1 byte	5.001	CRT
10	A, Switching cycle, counter value	4-byte value	4 byte	12.001	CR
11	A, Switching cycle, threshold	4-byte value	4 byte	12.001	CRW
12	A, Switching cycle, threshold overrun	1 = yes / 0 = no	1 bit	1.002	CRT
13	A, Power-on hours, counter value	4-byte value	4 byte	12.001	CR
14	A, Power-on hours, threshold	4-byte value	4 byte	12.001	CRW
15	A, Power-on hours, threshold overrun	1 = yes / 0 = no	1 bit	1.002	CRT
22	B, 8-bit scene	recall / save	1 byte	17.001	CW
23	B, Locking	On / Off	1 bit	1.003	CW
24	B, Night mode	On / Off	1 bit	1.003	CW
25	B, Switching	On / Off	1 bit	1.001	CW
26	B, Dimming	brighter / darker	4 bit	3.007	CW
27	B, Dimming value	8-bit value	1 byte	5.001	CW
29	B, Status switching	On / Off	1 bit	1.001	CRT
30	B, Status dimming value	8-bit value	1 byte	5.001	CRT
31	B, Switching cycle, counter value	4-byte value	4 byte	12.001	CR
32	B, Switching cycle, threshold	4-byte value	4 byte	12.001	CRW
33	B, Switching cycle, threshold overrun	1 = yes / 0 = no	1 bit	1.002	CRT
34	B, Power-on hours, counter value	4-byte value	4 byte	12.001	CR
35	B, Power-on hours, threshold	4-byte value	4 byte	12.001	CRW
36	B, Power-on hours, threshold overrun	1 = yes / 0 = no	1 bit	1.002	CRT

07 B0 A2 Dimmer 983901

3 Functions (Objects, Parameters)

The objects and parameters for channel A and channel B are configured in the same way and thus are only described once for channel A.

The actuator output can be configured individually with the following partial functions:

- Operating mode Normal mode
- Operating mode 1-level time switch mode
- Operating mode 2-level time switch mode
- Operating mode Flashing
- Night mode
- Locking
- Status messaging
- Number of switching cycles with or without threshold monitoring
- Number of power-on hours with or without threshold monitoring
- 8-bit scene control

The following sections describe the functions, which can be configured for each channel, including the associated objects and parameter settings.

Note

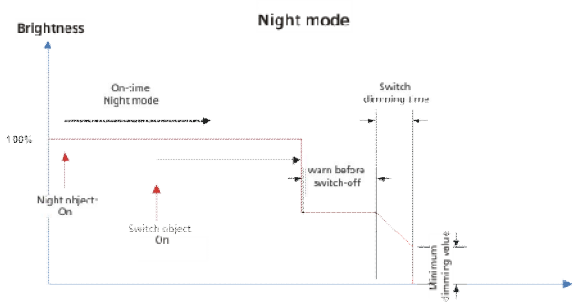
The number and names of the parameter windows in the ETS menues may vary as they are controlled via parameter settings.
Another parameter window may appear if due to dynamically added parameters the space in the first parameter window is exhausted.

3.1 Parameter „Device Functions“

Parameter	Settings
Transmission blocking period for status objects after supply/bus voltage recovery [1...60 seconds]	**15** (1...60)
This parameter ensures that immediately after bus voltage recovery respectively a new start of the device no unnecessary bus load is generated but status telegrams immediately following each other.	
Delay status objects [0...10 in 1/10 sec]	**2** (0...10)
This parameter determines if a delay respectively which delay is applied between two consecutively following status telegrams to avoid unnecessary bus load due to status telegrams immediately following each other.	

3.2 Operating mode: Normal Mode

In the operating mode “Normal mode” an additional night mode object can be added. When night mode is set via the night mode object then the behavior of the channel is similar to the 1-level time switch mode. The “on” period can be retriggered via the objects scene, switching, dimming brighter/darker or dimming value. When the “on” period has expired then the channel is turned off or, in case the “warning before turning off” is enabled, the dimming value is set to 50% of the last dimming value. If this value is below the minimum dimming value then the minimum dimming value is assumed. When the night mode object value is set to OFF (=0) then the timer mode is disabled.



07 B0 A2 Dimmer 983901

3.2.1 Parameter „Channel A, Functions, Objects"

This parameter window offers selection of the base function (normal mode, 1-level time switch mode, 2-level time switch mode, flashing) and of further functions of this actuator output channel.

The parameter "Operating mode" is set to "Normal mode".

Parameter	Settings
Operating mode	**Normal Mode** 1-level time switch mode 2-level time switch mode Flashing
This parameter sets whether the channel is to work as a "normal" dimming channel or in 1-level time switch mode, which can be switched on only via a switching, dimming, dimming value or scene recall command and is switched off automatically after the end of the configured on-time or whether it is to work in 2-level time switch mode or whether it is to "flash". A 2-level time switch mode is to be set for corridor and stairwell lighting if complete switching off of the lighting after the on-time 1 has elapsed is to be avoided. A 2-level time switch mode is also set for control of colored lighting effects. If "1-level time switch mode" is selected, then the parameter "ON period 1 (in minutes)" is also displayed. If a switching, dimming, dimming value or scene recall command is received again while 1-level time switch mode and on period 1 are running, then the timer is reset to its initial value and the on-time extended accordingly. After the configured „on" period has expired, the output channel, if the warning function is enabled (via the parameter „warning before switching off"), is dimmed to 50% of the current value. This is to warn the room user and allow him to operate the light switch and thus extend the "on" period by the configured value before the lighting is turned off. If 50% of the current dimming value is below the minimum dimming value then the minimum dimming value is assumed. If "2-level time switch mode" is selected, then the three parameters "ON period 1 (in minutes)", "ON period 2 (in minutes)" and "Dimming value during ON period 2 (in percent)" are also shown. Whereas dimming reverts to 0% at the end of a 1-level time switch mode, in 2-level time switch mode it will be dimmed at the end of the first ON period to the "dimming value during ON period 2" which can be above or below the previous dimming value. Dimming reverts to 0% at the end of the 2-level time switch mode. There is no warning before switching off In 2-level time switch mode. If "Flashing" is selected, then the two parameters "ON period Flashing (1...255 seconds)" and "OFF period Flashing (1...255 seconds)" are shown additionally, which define the blinking behavior. The switching object of the channel is used to start and end blinking. The dimming value during the "on" period is determined by the parameter "maximum dimming value". The objects scene, dimming, and dimming value and the associated parameters are not visible in the operating mode "flashing"	
Behavior on KNX power voltage failure	switch off; switch on to maximum dimming value; **no change**
This parameter determines the behavior of the actuator channel (dimmer output) on bus voltage failure: "no change" = On bus voltage failure the dimming value of the channel does not change. "switch on to maximum dimming value" = On bus voltage failure the channel is switched on to the maximum dimming value. "switch off" = On bus voltage failure the channel is switched off.	

07 B0 A2 Dimmer 983901

Parameter	Settings
Behavior on KNX power voltage recovery	switch off; switch on; switch on to "dimming value on bus voltage recovery"; **as before voltage failure**
On bus voltage failure the current switching states and dimming values of all channels are saved in non-volatile memory. This allows restoring the states at bus voltage failure on bus voltage recovery. This parameter determines the behavior of the actuator channel (dimmer output) on bus voltage recovery: "switch off": On bus voltage recovery the channel is switched off permanently (off state, 0%). "switch on": On bus voltage recovery the channel is switched on permanently (to the switching on value). switch on to "dimming value on bus voltage recovery": a new parameter "dimming value on bus voltage recovery" appears. The output is switched on to the value set by that parameter. "no change" = On bus voltage failure the dimming value of the channel does not change. "as before voltage failure": The state at bus voltage failure is restored.	
Value on power voltage recovery [0...100%]	**100** (0...100)
This parameter is visible, if the parameter „behavior on KNX power voltage recovery" is set to „ switch on to "dimming value on bus voltage recover" ". This parameter determines the dimming value to be set on bus voltage recovery. This value is limited by the minimum and maximum dimming values.	

The other parameters are covered in the sections

- 3.6 Night mode
- 3.7 Locking
- 3.8 Status messaging
- 3.9 Switching cycles counter
- 3.10 Power-on / Operating hours counter
- 3.11 Scene control

07 B0 A2 Dimmer 983901

3.2.2 Parameter „Channel A, Dimming"

This parameter window is used to set the behavior of the corresponding actuator output channel in "Normal mode".

Parameter	Settings
Load adaptation: Dimmer operation according to	**Automatic detection of load type;** Leading edge principle; Trailing edge principle
This parameter sets the type of load matching. With automatic load adaptation, the device checks the type of load when mains voltage is switched on and decides whether to select leading or trailing edge control. If the load type cannot be unambiguously determined, the automatic load adaptation can be deactivated and the operating mode manually fixed by setting the mode to "leading edge principle" or "trailing edge principle". Primarily, this is required for the operation of dimmable LED or energy-saving lamps (CFL). Note: • With LED and energy-saving lamps (CFL), we recommend that you do not set this mode to "Automatic load adaptation", but to "leading edge control" or "trailing edge control" as recommended by the manufacturer of the lamp. • "Leading edge" is more suitable for the dimming behaviour of LED or CFL. • "Trailing edge" occurs with less power-loss, so more lamps can be controlled at the load output. • The application checks the load two times. If there is no clear test result the device uses "leading edge". •	
compensation ripple control	No; **Yes**
This parameter determines if ripple control signals detected by the device shall automatically be compensated. Not or falsely compensated ripple control signals on the mains power may cause flickering of the lamp. In cases of islanding grids use "no".	
Minimum dimming value [1...50%]	**1** (1...50)
This parameter sets the minimum dimming value , which cannot be under-run when "dimming darker" (i.e. it can only be dimmed down to the minimum dimming value). This is useful to limit the dimming range that the dimming behaviour especially for LED and CFL can be optimized to a proper minimum brightness. If the parameter "Switching off via dimming darker" is set to "Yes", then a "Dimming darker" value below the minimum dimming value means that the channel will be switched off. If the parameter "Switching via dimming value" is set to "Off if dimming value < min. dimming value", then a dimming value below the minimum dimming value means that the channel will be switched off. If the parameter "Switching via dimming value" is set to "Switching On and switching Off possible", then a dimming value below the minimum dimming value means that the channel will be switched off.	
Maximum dimming value [10...100%]	**100** (10...100)
This parameter sets the maximum dimming value, which cannot be exceeded (i.e. in any case dimming is only possible to the maximum dimming value). This is useful to limit the dimming range that the dimming behaviour especially for LED and CFL can be optimized to a proper maximun brightness. When dimming brighter this is only possible up to the maximum dimming value. If a dimming value above the maximum dimming value is received then the output channel is only dimmed to the maximum dimming value.	

07 B0 A2 Dimmer 983901

Parameter	Settings
Dimming time for switching On/Off [0...255 seconds]	**0** (0...255)
This parameter determines if the configured ON value respectively the OFF value 0% are "jumped" to (dimming time = 0) or in what time it will be dimmed to the relevant value. If the channel is not switched off from 100% to 0% respectively switched on from 0% to 100% then the dimming time is proportionally adjusted to the difference of the old and new dimming values.	
Dimming time for dimming darker / brighter from 0% to 100% [1...255 seconds]	**5** (1...255)
This parameter determines the time in which dimming is performed from 0% to 100% (or from 100% to 0%) with relative dimming. If the channel is not dimmed from 0% to 100% respectively from 100% to 0% then the dimming time is proportionally adjusted to the difference of the old and new dimming values. Depending on the difference the time for reaching the target value varies.	
Dimming time for setting dimming value from 0 to 100% [0...255 seconds]	**0** (0...255)
This parameter determines whether a new dimming value is to be jumped to (dimming time = 0) or in what time it will be dimmed from 0% to 100% (or from 100% to 0%). If the channel is not dimmed from 0% to 100% respectively from 100% to 0% then the dimming time is proportionally adjusted to the difference of the old and new dimming values. Depending on the difference the time for reaching the target value varies.	
Starting value	Dimming value at switching Off; **switch On value according to parameter;** Last received dimming value
This parameter defines to which value this channel is to be "jumped" or dimmed on receiving a telegram with an "ON" switching command. If the setting "dimming value at switching OFF" is selected, then it switches to the last dimming value before switching off. If the channel is switched off by a dimming value below the minimum dimming value or by a dimming darker below the minimum dimming value or by a limited on-time (timer mode or lighting for cleaning in night mode), then the lighting switches on again at that last dimming value in each case. The setting "dimming value at switching OFF" is beneficial in a bedroom, where pressing the switch briefly for the first time then switches to the dimming value at switching off and pressing the switch briefly a second time dims or jumps to the max. dimming value. The setting "last received dimming value" is, for example needed for constant brightness control, if the lighting is not to be switched off by dimming values sent by a constant brightness controller which are below the minimum and not to be switched on by a dimming value above it. The parameter "Switching via dimming value n" must also be set to "not possible" for this.	
Switch On value [1...100%]	**100** (1...100)
This parameter is only visible if the parameter "Starting value" is set to "switch on value according to parameter". This parameter determines the dimming value to be dimmed to when an "on" switching command is received. Some LED and CFL need a minimum starting value to start the glowing which is higher than the minimum dimming value.	
Switching off via dimming darker	No **Yes**
If the channel is to be switched off in the switched on status by dimming to a value below the minimum dimming value, then this parameter must be set to "Yes".	

07 B0 A2 Dimmer 983901

Parameter	Settings
Switching on via dimming brighter	No **Yes**
If switching on is to be possible in the off state by receiving a relative dimming value "brighter", this parameter must be set to "Yes". In this case, the channel is always switched on first, jumped to the minimum dimming value and then dimmed brighter to the received relative dimming value using the configured dimming time for dimming brighter / darker.	
Switching via dimming value	not possible; **On if dimming value >= min. dimming value;** Off if dimming value < min. dimming value; Switching On and switching Off possible; On if dimming value > 0% / Off if dimming value = 0%
If switching on in the off state shall be possible by receiving a dimming value, which is the same as or greater than the minimum dimming value, then this parameter must be set to "ON if dimming value ≥ min. dimming value". The channel is then switched on and either jumped or dimmed to the dimming value with the configured dimming time for dimming value setting. If the received dimming value is below the minimum dimming value, then the channel remains off. Switching off via dimming value setting is impossible with this setting. If the channel is switched on and this parameter is set to "OFF if dimming value < min. dimming value", then receiving a telegram with a dimming value < the minimum dimming value leads to dimming (with the configured dimming time for dimming value setting) down to the minimum dimming value and then to switching off of the channel. Switching on with dimming value setting is impossible with this setting. If this parameter is set to "switching ON and switching OFF possible", then the channel is switched on if the received dimming value is ≥ the minimum dimming value and it is switched off if the received dimming value is < min. dimming value. If the parameter is set to "ON if dimming value > 0% / OFF if dimming value = 0%", then any dimming value > 0% switches the channel on. If the dimming value is below the min. dimming value, the channel is set to the min. dimming value. The channel is switched off only after receipt of a dimming value 0%.	
ON delay [0...600 seconds]	**0** (0...600)
This parameter sets the wanted ON delay time. A set ON delay acts only on the object "Switching". The default setting "0" means that ON commands are executed immediately.	
OFF delay **[0...600 seconds]**	**0** (0...600)
This parameter sets the wanted OFF delay time. A set OFF delay acts only on the object "Switching". The default setting "0" means that OFF commands are executed immediately.	

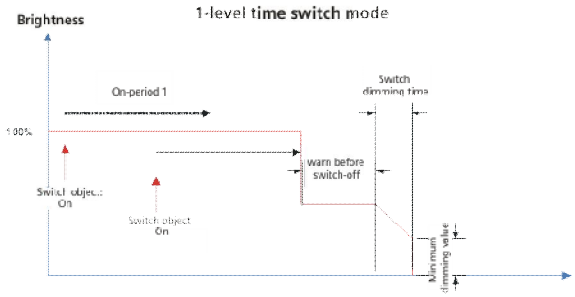
07 B0 A2 Dimmer 983901

3.2.3 Objects

Obj	Object name	Function	Type	Flag
4	A, Switching	On / Off	1 bit 1.001	CW
Via this object the telegrams are received to switch the load connected to the respective channel on or off.				
5	A, Dimming	brighter / darker	4 bit 3.007	CW
Via this object the dimming telegrams for the relevant channel are received.				
6	A, Dimming value	8-bit value	1 Byte 5.001	CW
Via this object telegrams with a dimming value for the channel are received. If the received dimming value is below the minimum dimming value the behavior of the channel is determined by the parameter “switching via dimming value”. The dimming time for dimming to the dimming value depends on the parameter “dimming time for setting dimming value from 0% to 100%”.				

3.3 Operating mode: 1-level time switch mode

The “on” period can be triggered and retriggered via the objects scene, switching, dimming brighter/darker or dimming value. When the “on” period has expired then the channel is turned off or, in case the “warning before turning off” is enabled, the dimming value is set to 50% of the last dimming value. If this value is below the minimum dimming value then the minimum dimming value is assumed.



3.3.1 Parameter „Channel A, Functions, Objects“

This parameter window offers selection of the base function (Normal Mode, 1-level time switch mode, 2-level time switch mode, Flashing) and of further functions of this actuator output channel.

The parameter “Operating mode” is set to “1-level time switch mode”.

Parameter	Settings
Operating mode	**Normal mode** 1-level time switch mode 2-level time switch mode Flashing
This parameter sets whether the channel is to work as a "normal" dimming channel or in 1-level time switch mode, which can be switched on only via a switching, dimming, dimming value or scene recall command and is switched off automatically after the end of the configured on-time or whether it is to work in 2-level time switchmode or whether it is to "flash". A 2-level time switch mode is to be set for corridor and stairwell lighting if complete switching off of the lighting after the on-time 1 has elapsed is to be avoided. A 2-level time switch mode is also set for control of colored lighting effects. If "1-level time switch mode" is selected, then the parameter "ON period 1 (in minutes)" is also displayed. If a switching, dimming, dimming value or scene recall command is received again while 1-level time switch mode and on period 1 are running, then the timer is reset to its initial value and the on-time extended accordingly. After the configured „on“ period has expired, the output channel, if the warning function is enabled (via the parameter „warning before switching off“), is dimmed to 50% of the current value. This is to warn the room user and allow him to operate the light switch and	

07 B0 A2 Dimmer 983901

Parameter	Settings
thus extend the “on” period by the configured value before the lighting is turned off. If 50% of the current dimming value is below the minimum dimming value then the minimum dimming value is assumed. If "2-level time switch mode" is selected, then the three parameters "ON period 1 (in minutes)“, "ON period 2 (in minutes)" and "Dimming value during ON period 2 (in percent)" are also shown. Whereas dimming reverts to 0% at the end of a 1-level time switch mode, in 2-level time switch mode it will be dimmed at the end of the first ON period to the "dimming value during ON period 2" which can be above or below the previous dimming value. Dimming reverts to 0% at the end of the 2-level time switch mode. There is no warning before switching off In 2-level time switch mode. If "Flashing" is selected, then the two parameters "ON period Flashing (1...255 seconds)" and "OFF period Flashing (1...255 seconds)" are shown additionally, which define the blinking behavior. The switching object of the channel is used to start and end blinking. The dimming value during the “on” period is determined by the parameter “maximum dimming value”. The objects scene, dimming, and dimming value and the associated parameters are not visible in the operating mode “Flashing”.	
Warning before switching Off [0...255 seconds]	**30** (0...255)
This parameter determines for a channel in night mode or in 1-level time switch mode, how long after the timer has expired an imminent switching off shall be signaled by reducing the brightness (50% of the current dimming value). When the room user operates the light switch then the lighting is turned on for the period configured for night mode or 1-level switch time mode.	
Behavior on KNX power voltage failure	switch off; switch on to maximum dimming value; **no change**
This parameter determines the behavior of the actuator channel (dimmer output) on bus voltage failure: “no change” = On bus voltage failure the dimming value of the channel does not change. “switch on to maximum dimming value” = On bus voltage failure the channel is switched on to the maximum dimming value. “switch off” = On bus voltage failure the channel is switched off.	
Behavior on KNX power voltage recovery	switch off; switch on; switch on to „dimming value on bus voltage recovery“; **as before voltage failure**
On bus voltage failure the current switching states and dimming values of all channels are saved in non-volatile memory. This allows restoring the states at bus voltage failure on bus voltage recovery. This parameter determines the behavior of the actuator channel (dimmer output) on bus voltage recovery: “switch off”: On bus voltage recovery the channel is switched off permanently (off state, 0%). “switch on”: On bus voltage recovery the channel is switched on permanently (to the switching on value). switch on to “dimming value on bus voltage recovery”: a new parameter “dimming value on bus voltage recovery” appears. The output is switched on to the value set by that parameter. “no change” = On bus voltage failure the dimming value of the channel does not change. “as before voltage failure”: The state at bus voltage failure is restored.	
Value on power voltage recovery [0...100%]	**100** (0...100)
This parameter is visible, if the parameter „behavior on KNX power voltage recovery“ is set to „ switch on to “dimming value on bus voltage recovery“ “. This parameter determines the dimming value to be set on bus voltage recovery. This value is limited by the minimum and maximum dimming values.	

The other parameters are covered in the sections

- 3.6 Night mode
- 3.7 Locking
- 3.8 Status messaging
- 3.9 Switching cycles counter
- 3.10 Power-on / Operating hours counter
- 3.11 Scene control

07 B0 A2 Dimmer 983901

3.3.2 Parameter „Channel A, Dimming"

This parameter window is used to set the behavior of the corresponding actuator output channel in "1-level time switch mode".

Parameter	Settings
Load adaptation: Dimmer operating according to	**Automatic detection of load type;** Leading edge principle; Trailing edge principle
This parameter sets the type of load matching. With automatic load adaptation, the device checks the type of load when mains voltage is switched on and decides whether to select leading or trailing edge control. If the load type cannot be unambiguously determined, the automatic load adaptation can be deactivated and the operating mode manually fixed by setting the mode to "leading edge principle" or "trailing edge principle". Primarily, this is required for the operation of dimmable LED or energy-saving lamps (CFL). Note: • With LED and energy-saving lamps (CFL), we recommend that you do not set this mode to "Automatic load adaptation", but to "leading edge control" or "trailing edge control" as recommended by the manufacturer of the lamp. • "Leading edge" is more suitable for the dimming behaviour of LED or CFL. • "Trailing edge" occurs with less power-loss, so more lamps can be controlled at the load output. • The application checks the load two times. If there is no clear test result the device uses "leading edge". •	
compensation ripple control	No; **Yes**
This parameter determines if ripple control signals detected by the device shall automatically be compensated. Not or falsely compensated ripple control signals on the mains power may cause flickering of the lamp. In cases of islanding grids use "no".	
Minimum dimming value [1...50%]	**1** (1...50)
This parameter sets the minimum dimming value , which cannot be under-run when "dimming darker" (i.e. it can only be dimmed down to the minimum dimming value). This is useful to limit the dimming range that the dimming behaviour especially for LED and CFL can be optimized to a proper minimum brightness. If the parameter "Switching off via dimming darker" is set to "Yes", then a "Dimming darker" value below the minimum dimming value means that the channel will be switched off. If the parameter "Switching via dimming value" is set to "Off if dimming value < min. dimming value", then a dimming value below the minimum dimming value means that the channel will be switched off. If the parameter "Switching via dimming value" is set to "Switching On and switching Off possible", then a dimming value below the minimum dimming value means that the channel will be switched off.	
Maximum dimming value [10...100%]	**100** (10...100)
This parameter sets the maximum dimming value, which cannot be exceeded (i.e. in any case dimming is only possible to the maximum dimming value). This is useful to limit the dimming range that the dimming behaviour especially for LED and CFL can be optimized to a proper maximun brightness. When dimming brighter this is only possible up to the maximum dimming value. If a dimming value above the maximum dimming value is received then the output channel is only dimmed to the maximum dimming value.	

07 B0 A2 Dimmer 983901

Parameter	Settings
Dimming time for switching On/Off [0...255 seconds]	**0** (0...255)
This parameter determines if the configured ON value respectively the OFF value 0% are “jumped” to (dimming time = 0) or in what time it will be dimmed to the relevant value. If the channel is not switched off from 100% to 0% respectively switched on from 0% to 100% then the dimming time is proportionally adjusted to the difference of the old and new dimming values.	
Dimming time for dimming darker / brighter from 0% to 100% [1...255 seconds]	**5** (1...255)
This parameter determines the time in which dimming is performed from 0% to 100% (or from 100% to 0%) with relative dimming. If the channel is not dimmed from 0% to 100% respectively from 100% to 0% then the dimming time is proportionally adjusted to the difference of the old and new dimming values. Depending on the difference the time for reaching the target value varies.	
Dimming time for setting dimming value from 0 to 100% [0...255 seconds]	**0** (0...255)
This parameter determines whether a new dimming value is to be jumped to (dimming time = 0) or in what time it will be dimmed from 0% to 100% (or from 100% to 0%). If the channel is not dimmed from 0% to 100% respectively from 100% to 0% then the dimming time is proportionally adjusted to the difference of the old and new dimming values. Depending on the difference the time for reaching the target value varies.	
Starting value	Dimming value at switching Off; **switch On value according to parameter;** Last received dimming value
This parameter defines to which value this channel is to be “jumped” or dimmed on receiving a telegram with an "ON" switching command. If the setting "dimming value at switching OFF" is selected, then it switches to the last dimming value before switching off. If the channel is switched off by a dimming value below the minimum dimming value or by a dimming darker below the minimum dimming value or by a limited on-time (timer mode or lighting for cleaning in night mode), then the lighting switches on again at that last dimming value in each case. The setting "dimming value at switching OFF" is beneficial in a child's room or bedroom, where pressing the switch briefly for the first time then switches to the dimming value at switching off and pressing the switch briefly a second time dims or jumps to the max. dimming value. The setting "last received dimming value 1 or 2" is, for example needed for constant brightness control, if the lighting is not to be switched off by dimming values sent by a constant brightness controller which are below the minimum and not to be switched on by a dimming value above it. The parameter "Switching via dimming value n" must also be set to "not possible" for this.	
Switch On value [1...100%]	**100** (1...100)
This parameter is only visible if the parameter “Starting value” is set to “switch On value according to parameter”. This parameter determines the dimming value to be dimmed to when an “on” switching command is received. Some LED and CFL need a minimum starting value to start the glowing which is higher than the minimum dimming value.	

07 B0 A2 Dimmer 983901

Parameter	Settings
Switching off via dimming darker	No **Yes**
If the channel is to be switched off in the switched on status by dimming to a value below the minimum dimming value, then this parameter must be set to "Yes".	
Switching on via dimming brighter	No **Yes**
If switching on is to be possible in the off state by receiving a relative dimming value "brighter", this parameter must be set to "Yes". In this case, the channel is always switched on first, jumped to the minimum dimming value 1 and then dimmed brighter to the received relative dimming value using the configured dimming time for dimming brighter / darker.	
Switching via dimming value	not possible; **On if dimming value >= min. dimming value;** Off if dimming value < min. dimming value; Switching On and switching Off possible; On if dimming value > 0% / Off if dimming value = 0%
If switching on in the off state shall be possible by receiving a dimming value, which is the same as or greater than the minimum dimming value, then this parameter must be set to "ON if dimming value ≥ min. dimming value". The channel is then switched on and either jumped or dimmed to the dimming value with the configured dimming time for dimming value setting. If the received dimming value is below the minimum dimming value, then the channel remains off. Switching off via dimming value setting is impossible with this setting. If the channel is switched on and this parameter is set to "OFF if dimming value < min. dimming value", then receiving a telegram with a dimming value < the minimum dimming value leads to dimming (with the configured dimming time for dimming value setting) down to the minimum dimming value 1 and then to switching off of the channel. Switching on with dimming value setting is impossible with this setting. If this parameter is set to "switching ON and switching OFF possible", then the channel is switched on if the received dimming value is ≥ the minimum dimming value 1 and it is switched off if the received dimming value is < min. dimming value 1. If the parameter is set to "ON if dimming value > 0% / OFF if dimming value = 0%", then any dimming value > 0% switches the channel on. If the dimming value is below the min. dimming value, the channel is set to the min. dimming value. The channel is switched off only after receipt of a dimming value 0%.	
ON period 1 [1...255 minutes]	**15** (1...255)
This parameter is visible if the operating mode "1-level switch time mode" or "2-level switch time mode" is selected. This parameter determines the ON period respectively the ON period 1 in 2-level switch time mode. If during the "on" period a command is received via the objects scene, switching, dimming brighter/darker or dimming value, then that command is executed and the timer for the "on" period is retriggered.	
ON delay [0...600 seconds]	**0** (0...600)
This parameter sets the wanted ON delay time. A set ON delay acts only on the object "Switching". The default setting "0" means that ON commands are executed immediately.	
OFF delay [0...600 seconds]	**0** (0...600)
This parameter sets the wanted OFF delay time. A set OFF delay acts only on the object "Switching". The default setting "0" means that OFF commands are executed immediately.	

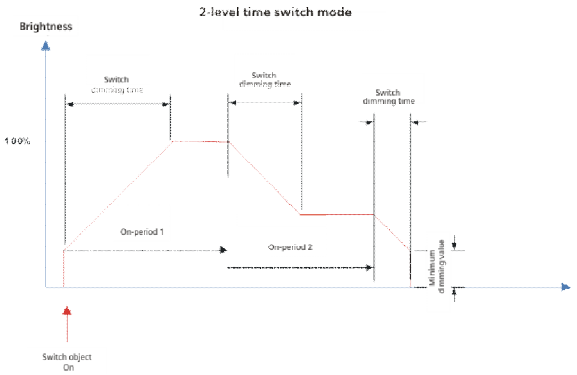
07 B0 A2 Dimmer 983901

3.3.3 Objects

Obj	Object name	Function	Type	Flag
4	A, Switching	On / Off	1 bit 1.001	CW
Via this object the telegrams are received to switch the load connected to the respective channel on or off.				
5	A, Dimming	brighter / darker	4 bit 3.007	CW
Via this object the dimming telegrams for the relevant channel are received.				
6	A, dimming value	8-bit value	1 Byte 5.001	CW
Via this object telegrams with a dimming value for the channel are received. If the received dimming value is below the minimum dimming value the behavior of the channel is determined by the parameter “switching via dimming value”. The dimming time for dimming to the dimming value depends on the parameter “dimming time for setting dimming value from 0% to 100%”.				

3.4 Operating mode: 2-level time switch mode

The “on” period 1 can be triggered and retriggered via the objects scene, switching, dimming brighter/darker or dimming value. When the “on” period 1 has expired then the channel is dimmed to the dimming value for “on” period 2 in the time “dimming time switching”. There is no warning before switching off In 2-level time switch mode. When the timer is retriggered during “on” period 2 then the timer is reset into the “on” period 1.



3.4.1 Parameter „Channel A,Functions, Objects“

This parameter window offers selection of the base function (Normal Mode, 1-level time switch mode, 2-level time switch mode, Flashing) and of further functions of this actuator output channel.

The parameter “Operating mode” is set to “2-level time switch mode”.

Parameter	Settings
Operating mode	**Normal Mode** 1-level time switch mode 2-level time switch mode Flashing
This parameter sets whether the channel is to work as a "Normal" dimming channel or in 1-level time switch mode, which can be switched on only via a switching, dimming, dimming value or scene recall command and is switched off automatically after the end of the configured on-time or whether it is to work in 2-level time switch mode or whether it is to "Flash". A 2-level time switch mode is to be set for corridor and stairwell lighting if complete switching off of the lighting after the on-time 1 has elapsed is to be avoided. A 2-level time switch mode is also set for control of colored lighting effects.	

07 B0 A2 Dimmer 983901

Parameter	Settings
If "1-level time switch mode" is selected, then the parameter "ON period 1 (in minutes)" is also displayed. If a switching, dimming, dimming value or scene recall command is received again while 1-level time switch mode and on period 1 are running, then the timer is reset to its initial value and the on-time extended accordingly. After the configured „on" period has expired, the output channel, if the warning function is enabled (via the parameter „Warning before switching Off"), is dimmed to 50% of the current value. This is to warn the room user and allow him to operate the light switch and thus extend the "on" period by the configured value before the lighting is turned off. If 50% of the current dimming value is below the minimum dimming value then the minimum dimming value is assumed. If "2-level time switch mode" is selected, then the three parameters "ON period 1 (in minutes)", "ON period 2 (in minutes)" and "Dimming value during ON period 2 (in percent)" are also shown. Whereas dimming reverts to 0% at the end of a 1-level time switch mode, in 2-level time switch mode it will be dimmed at the end of the first ON period to the "dimming value during ON period 2" which can be above or below the previous dimming value. Dimming reverts to 0% at the end of the 2-level time switch mode. There is no warning before switching off In 2-level time switch mode. If "Flashing" is selected, then the two parameters "ON period Flashing (1...255 seconds)" and "OFF period Flashing (1...255 seconds)" are shown additionally, which define the blinking behavior. The switching object of the channel is used to start and end blinking. The dimming value during the "on" period is determined by the parameter "maximum dimming value". The objects scene, dimming, and dimming value and the associated parameters are not visible in the operating mode "Flashing"	
Behavior on KNX power voltage failure	switch off; switch on to maximum dimming value; **no change**
This parameter determines the behavior of the actuator channel (dimmer output) on bus voltage failure: "no change" = On bus voltage failure the dimming value of the channel does not change. "switch on to maximum dimming value" = On bus voltage failure the channel is switched on to the maximum dimming value. "switch off" = On bus voltage failure the channel is switched off.	
Behavior on KNX power voltage recovery	switch off; switch on; switch on to "dimming value on bus voltage recovery"; **as before voltage failure**
On bus voltage failure the current switching states and dimming values of all channels are saved in non-volatile memory. This allows restoring the states at bus voltage failure on bus voltage recovery. This parameter determines the behavior of the actuator channel (dimmer output) on bus voltage recovery: "switch off": On bus voltage recovery the channel is switched off permanently (off state, 0%). "switch on": On bus voltage recovery the channel is switched on permanently (to the switching on value). switch on to "dimming value on bus voltage recovery": a new parameter "dimming value on bus voltage recovery" appears. The output is switched on to the value set by that parameter. "no change" = On bus voltage failure the dimming value of the channel does not change. "as before voltage failure": The state at bus voltage failure is restored.	
Value on bus voltage recovery [0...100%]	**100** (0...100)
This parameter is visible, if the parameter „behavior on KNX power voltage recovery" is set to „ switch on to "dimming value on bus voltage recovery" ". This parameter determines the dimming value to be set on bus voltage recovery. This value is limited by the minimum and maximum dimming values.	

07 B0 A2 Dimmer 983901

The other parameters are covered in the sections

- 3.6 Night mode
- 3.7 Locking
- 3.8 Status messaging
- 3.9 Switching cycles counter
- 3.10 Power-on / Operating hours counter
- 3.11 Scene control

3.4.2 Parameter „Channel A,Dimming"

This parameter window is used to set the behavior of the corresponding actuator output channel in "2-level time switch mode".

Parameter	Settings
Load adaptation: Dimmer operating according to	**Automatic detection of load type;** Leading edge principle; Trailing edge principle
This parameter sets the type of load matching. With automatic load adaptation, the device checks the type of load when mains voltage is switched on and decides whether to select leading or trailing edge control. If the load type cannot be unambiguously determined, the automatic load adaptation can be deactivated and the operating mode manually fixed by setting the mode to "leading edge principle" or "trailing edge principle". Primarily, this is required for the operation of dimmable LED or energy-saving lamps (CFL). Note: • With LED and energy-saving lamps (CFL), we recommend that you do not set this mode to "Automatic load adaptation", but to "leading edge control" or "trailing edge control" as recommended by the manufacturer of the lamp. • "Leading edge" is more suitable for the dimming behaviour of LED or CFL. • "Trailing edge" occurs with less power-loss, so more lamps can be controlled at the load output. • The application checks the load two times. If there is no clear test result the device uses "leading edge".	
compensation ripple control	No; **Yes**
This parameter determines if ripple control signals detected by the device shall automatically be compensated. Not or falsely compensated ripple control signals on the mains power may cause flickering of the lamp. In cases of islanding grids use "no".	
Minimum dimming value [1...50%]	**1** (1...50)
This parameter sets the minimum dimming value , which cannot be under-run when "dimming darker" (i.e. it can only be dimmed down to the minimum dimming value). This is useful to limit the dimming range that the dimming behaviour especially for LED and CFL can be optimized to a proper minimum brightness. If the parameter "Switching off via dimming darker" is set to "Yes", then a "Dimming darker" value below the minimum dimming value means that the channel will be switched off. If the parameter "Switching via dimming value" is set to "Off if dimming value < min. dimming value", then a dimming value below the minimum dimming value means that the channel will be switched off. If the parameter "Switching via dimming value" is set to "Switching On and switching Off possible", then a dimming value below the minimum dimming value means that the channel will be switched off.	

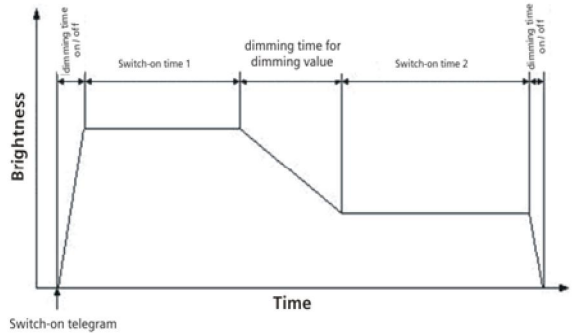
07 B0 A2 Dimmer 983901

Parameter	Settings
Maximum dimming value [10...100%]	**100** (10...100)
This parameter sets the maximum dimming value, which cannot be exceeded (i.e. in any case dimming is only possible to the maximum dimming value). This is useful to limit the dimming range that the dimming behaviour especially for LED and CFL can be optimized to a proper maximun brightness. When dimming brighter this is only possible up to the maximum dimming value. If a dimming value above the maximum dimming value is received then the output channel is only dimmed to the maximum dimming value.	
Dimming time for switching On/Off [0...255 seconds]	**0** (0...255)
This parameter determines if the configured ON value respectively the OFF value 0% are "jumped" to (dimming time = 0) or in what time it will be dimmed to the relevant value. If the channel is not switched off from 100% to 0% respectively switched on from 0% to 100% then the dimming time is proportionally adjusted to the difference of the old and new dimming values.	
Dimming time for dimming darker / brighter from 0% to 100% [1...255 seconds]	**5** (1...255)
This parameter determines the time in which dimming is performed from 0% to 100% (or from 100% to 0%) with relative dimming. If the channel is not dimmed from 0% to 100% respectively from 100% to 0% then the dimming time is proportionally adjusted to the difference of the old and new dimming values. Depending on the difference the time for reaching the target value varies.	
Dimming time for setting dimming value from 0 to 100% [0...255 seconds]	**0** (0...255)
This parameter determines whether a new dimming value is to be jumped to (dimming time = 0) or in what time it will be dimmed from 0% to 100% (or from 100% to 0%). If the channel is not dimmed from 0% to 100% respectively from 100% to 0% then the dimming time is proportionally adjusted to the difference of the old and new dimming values. Depending on the difference the time for reaching the target value varies.	
Starting value	Dimming value at switching Off; **switch On value according to parameter;** Last received dimming value
This parameter defines to which value this channel is to be "jumped" or dimmed on receiving a telegram with an "ON" switching command. If the setting "Dimming value at switching OFF" is selected, then it switches to the last dimming value before switching off. If the channel is switched off by a dimming value below the minimum dimming value or by a dimming darker below the minimum dimming value or by a limited on-time (timer mode or lighting for cleaning in night mode), then the lighting switches on again at that last dimming value in each case. The setting "dimming value at switching OFF" is beneficial in a child's room or bedroom, where pressing the switch briefly for the first time then switches to the dimming value at switching off and pressing the switch briefly a second time dims or jumps to the max. dimming value. The setting "last received dimming value 1 or 2" is, for example needed for constant brightness control, if the lighting is not to be switched off by dimming values sent by a constant brightness controller which are below the minimum and not to be switched on by a dimming value above it. The parameter "Switching via dimming value n" must also be set to "not possible" for this.	

07 B0 A2 Dimmer 983901

Parameter	Settings
Switch On value [1...100%]	**100** (1...100)
This parameter is only visible if the parameter "Starting value" is set to "switch on value according to parameter". This parameter determines the dimming value to be dimmed to when an "on" switching command is received. Some LED and CFL need a minimum starting value to start the glowing which is higher than the minimum dimming value.	
Switching off via dimming darker	No **Yes**
If the channel is to be switched off in the switched on status by dimming to a value below the minimum dimming value, then this parameter must be set to "Yes".	
Switching on via dimming brighter	No **Yes**
If switching on is to be possible in the off state by receiving a relative dimming value "brighter", this parameter must be set to "Yes". In this case, the channel is always switched on first, jumped to the minimum dimming value 1 and then dimmed brighter to the received relative dimming value using the configured dimming time for dimming brighter / darker.	
Switching via dimming value	not possible; **On if dimming value >= min. dimming value;** Off if dimming value < min. dimming value; Switching On and switching Off possible; On if dimming value > 0% / Off if dimming value = 0%
If switching on in the off state shall be possible by receiving a dimming value, which is the same as or greater than the minimum dimming value, then this parameter must be set to "ON if dimming value ≥ min. dimming value". The channel is then switched on and either jumped or dimmed to the dimming value with the configured dimming time for dimming value setting. If the received dimming value is below the minimum dimming value, then the channel remains off. Switching off via dimming value setting is impossible with this setting. If the channel is switched on and this parameter is set to "OFF if dimming value < min. dimming value", then receiving a telegram with a dimming value < the minimum dimming value leads to dimming (with the configured dimming time for dimming value setting) down to the minimum dimming value 1 and then to switching off of the channel. Switching on with dimming value setting is impossible with this setting. If this parameter is set to "switching ON and switching OFF possible", then the channel is switched on if the received dimming value is ≥ the minimum dimming value 1 and it is switched off if the received dimming value is < min. dimming value 1. If the parameter is set to "ON if dimming value > 0% / OFF if dimming value = 0%", then any dimming value > 0% switches the channel on. If the dimming value is below the min. dimming value, the channel is set to the min. dimming value. The channel is switched off only after receipt of a dimming value 0%.	
ON period 1 **[1...255 minutes]**	**15** (1...255)
This parameter is visible if the operating mode "1-level switch time mode" or "2-level switch time mode" is selected. This parameter determines the ON period respectively the ON period 1 in 2-level switch time mode. If during the "on" period a command is received via the objects scene, switching, dimming brighter/darker or dimming value, then that command is executed and the timer for the "on" period is retriggered.	

07 B0 A2 Dimmer 983901

Parameter	Settings
ON period 2 **[1...255 minutes]**	**15** (1...255)
This parameter is visible if the operating mode "2-level switch time mode" is selected. This parameter determines the ON period 2 in 2-level switch time mode. If during the "on" period a command is received via the objects scene, switching, dimming brighter/darker or dimming value, then that command is executed, the timer for the "on" period 1 is retriggered and the 2-level switch time is started again.	
Dimming value during ON period 2 [0...100%]	**50** (0...100)
This parameter determines the dimming value to be used during ON period 2 in 2-level switch time mode. The diagram below shows an example of the dimming curve in 2-level switch time mode.  	
ON delay **[0...600 seconds]**	**0** (0...600)
This parameter sets the wanted ON delay time. A set ON delay acts only on the object "Switching". The default setting "0" means that ON commands are executed immediately.	
OFF delay **[0...600 seconds]**	**OFF delay** **[0...600 seconds]**
This parameter sets the wanted OFF delay time. A set OFF delay acts only on the object "Switching". The default setting "0" means that OFF commands are executed immediately.	

3.4.3 Objects

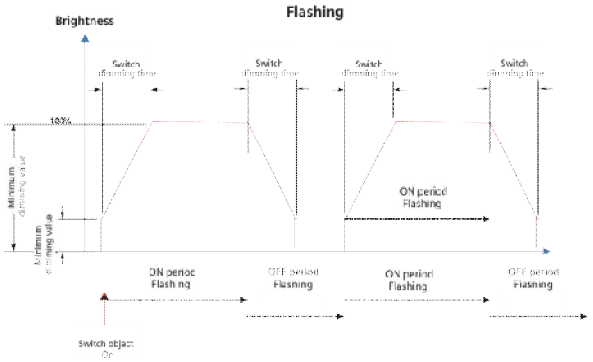
Obj	Object name	Function	Type	Flag
4	A, Switching	On / Off	1 bit 1.001	CW
Via this object the telegrams are received to switch the load connected to the respective channel on or off.				
5	A, Dimming	brighter / darker	4 bit 3.007	CW
Via this object the dimming telegrams for the relevant channel are received.				

07 B0 A2 Dimmer 983901

Obj	Object name	Function	Type	Flag
6	A, Dimming value	8-bit value	1 Byte 5.001	CW
Via this object telegrams with a dimming value for the channel are received. If the received dimming value is below the minimum dimming value the behavior of the channel is determined by the parameter “switching via dimming value”. The dimming time for dimming to the dimming value depends on the parameter “dimming time for setting dimming value from 0% to 100%”.				

3.5 Operating mode: Flashing

In operating mode “Flashing” only the switching object is enabled, via which the flashing mode can be switched on and off. Via parameter settings the objects for counting of switching cycles, counting of operating hours, switching status and locking can be enabled. The following additional parameters are available: Behavior on KNX power voltage failure and recovery, maximum and minimum dimming value, dimming time for switching and the on and off period when flashing.



3.5.1 Parameter „Channel A, Functions, Objects“

This parameter window offers selection of the base function (normal mode, 1-level time switch mode, 2-level time switch mode, flashing) and of further functions of this actuator output channel.

The parameter “Operating mode” is set to “Flashing”.

Parameter	Settings
Operating mode	**Normal mode** 1-level time switch mode 2-level time switch mode Flashing
This parameter sets whether the channel is to work as a "normal" dimming channel or in 1-level time switch mode, which can be switched on only via a switching, dimming, dimming value or scene recall command and is switched off automatically after the end of the configured on-time or whether it is to work in 2-level time switch mode or whether it is to "flash". A 2-level time switch mode is to be set for corridor and stairwell lighting if complete switching off of the lighting after the on-time 1 has elapsed is to be avoided. A 2-level time switch mode is also set for control of colored lighting effects. If "1-level time switch mode" is selected, then the parameter "ON period 1 (in minutes)" is also displayed. If a switching, dimming, dimming value or scene recall command is received again while 1-level time switch mode and on period 1 are running, then the timer is reset to its initial value and the on-time extended accordingly. After the configured „on“ period has expired, the output channel, if the warning function is enabled (via the parameter „warning before switching off“), is dimmed to 50% of the current value. This is to warn the room user and allow him to		

07 B0 A2 Dimmer 983901

Parameter	Settings
operate the light switch and thus extend the "on" period by the configured value before the lighting is turned off. If 50% of the current dimming value is below the minimum dimming value then the minimum dimming value is assumed. If "2-level time switch mode" is selected, then the three parameters "ON period 1 (in minutes)", "ON period 2 (in minutes)" and "Dimming value during ON period 2 (in percent)" are also shown. Whereas dimming reverts to 0% at the end of a 1-level time switch mode, in 2-level time switch mode it will be dimmed at the end of the first ON period to the "dimming value during ON period 2" which can be above or below the previous dimming value. Dimming reverts to 0% at the end of the 2-level time switch mode. There is no warning before switching off In 2-level time switch mode. If "Flashing" is selected, then the two parameters "ON period Flashing (1...255 seconds)" and "OFF period Flashing (1...255 seconds)" are shown additionally, which define the blinking behavior. The switching object of the channel is used to start and end blinking. The dimming value during the "on" period is determined by the parameter "maximum dimming value". The objects scene, dimming, and dimming value and the associated parameters are not visible in the operating mode "flashing".	
Behavior on KNX power voltage failure	switch off; switch on to maximum dimming value; **no change**
This parameter determines the behavior of the actuator channel (dimmer output) on bus voltage failure: "no change" = On bus voltage failure the dimming value of the channel does not change. "switch on to maximum dimming value" = On bus voltage failure the channel is switched on to the maximum dimming value. "switch off" = On bus voltage failure the channel is switched off.	
Behavior on KNX power voltage recovery	switch off; switch on; **as before voltage failure**
On bus voltage failure the current switching states and dimming values of all channels are saved in non-volatile memory. This allows restoring the states at bus voltage failure on bus voltage recovery. This parameter determines the behavior of the actuator channel (dimmer output) on bus voltage recovery: "switch off": On bus voltage recovery the channel is switched off permanently (off state, 0%). "switch on": On bus voltage recovery the channel is switched on permanently (to the switching on value). "as before voltage failure": The state at bus voltage failure is restored.	

The other parameters are covered in the sections

- 3.6 Night mode
- 3.7 Locking
- 3.8 Status messaging
- 3.9 Switching cycles counter
- 3.10 Power-on / Operating hours counter
- 3.11 Scene control

07 B0 A2 Dimmer 983901

3.5.2 Parameter „Channel A, Dimming"

This parameter window is used to set the behavior of the corresponding actuator output channel in "flashing mode".

Parameter	Settings
Load adaptation: Dimmer operation according to	**Automatic detection of load type;** Leading edge principle; Trailing edge principle
This parameter sets the type of load matching. With automatic load adaptation, the device checks the type of load when mains voltage is switched on and decides whether to select leading or trailing edge control. If the load type cannot be unambiguously determined, the automatic load adaptation can be deactivated and the operating mode manually fixed by setting the mode to "leading edge principle" or "trailing edge principle". Primarily, this is required for the operation of dimmable LED or energy-saving lamps (CFL). Note: • With LED and energy-saving lamps (CFL), we recommend that you do not set this mode to "Automatic load adaptation", but to "leading edge control" or "trailing edge control" as recommended by the manufacturer of the lamp. • "Leading edge" is more suitable for the dimming behaviour of LED or CFL. • "Trailing edge" occurs with less power-loss, so more lamps can be controlled at the load output. • The application checks the load two times. If there is no clear test result the device uses "leading edge".	
compensation ripple control	No; **Yes**
This parameter determines if ripple control signals detected by the device shall automatically be compensated. Not or falsely compensated ripple control signals on the mains power may cause flickering of the lamp. In cases of islanding grids use "no".	
Minimum dimming value [1...50%]	**1** (1...50)
This parameter sets the minimum dimming value , which cannot be under-run when "dimming darker" (i.e. it can only be dimmed down to the minimum dimming value). This is useful to limit the dimming range that the dimming behaviour especially for LED and CFL can be optimized to a proper minimum brightness. If the parameter "Switching off via dimming darker" is set to "Yes", then a "Dimming darker" value below the minimum dimming value means that the channel will be switched off. If the parameter "Switching via dimming value" is set to "Off if dimming value < min. dimming value", then a dimming value below the minimum dimming value means that the channel will be switched off. If the parameter "Switching via dimming value" is set to "Switching On and switching Off possible", then a dimming value below the minimum dimming value means that the channel will be switched off.	
Maximum dimming value [10...100%]	**100** (10...100)
This parameter sets the maximum dimming value, which cannot be exceeded (i.e. in any case dimming is only possible to the maximum dimming value). This is useful to limit the dimming range that the dimming behaviour especially for LED and CFL can be optimized to a proper maximun brightness. When dimming brighter this is only possible up to the maximum dimming value. If a dimming value above the maximum dimming value is received then the output channel is only dimmed to the maximum dimming value.	

07 B0 A2 Dimmer 983901

Parameter	Settings
Dimming time for switching On/Off [0...255 seconds]	**0** (0...255)
This parameter determines if the configured ON value respectively the OFF value 0% are "jumped" to (dimming time = 0) or in what time it will be dimmed to the relevant value. If the channel is not switched off from 100% to 0% respectively switched on from 0% to 100% then the dimming time is proportionally adjusted to the difference of the old and new dimming values.	
ON period Flashing [1...255 seconds]	**1** (1...255)
This parameter determines the desired "on" flashing period. Flashing is started and stopped via the object "Switching on/off". The parameter "dimming time for switching on/off" determines if the configured ON value is "jumped" to (dimming time = 0) or in what time it will be dimmed to the relevant value. Dimming to the ON value may extend the lifetime of the lamp in flashing mode.	
OFF period Flashing [1...255 seconds]	**1** (1...255)
This parameter determines the desired "off" flashing period. The flashing frequency can be derived from the ON and OFF periods.	

3.5.3 Objects

Obj	Object name	Function	Type	Flag
4	A, Switching	On / Off	1 bit 1.001	CW
Via this object the switching telegrams are received.				

3.6 Night mode

3.6.1 Parameter „Channel A, Functions, Objects"

Parameter	Settings
Night mode	**No;** Yes
This parameter determines if the lighting can only be switched on for a limited period at night (e.g. as lighting for cleaning) or if it can still be switched on permanently (night mode = No). If "Night mode = Yes" is selected then an object "night mode On/Off" is added to enable or disable night mode via the bus and the following parameter appears.	
ON period during night mode [1...255 minutes]	**30** (1...255)
This parameter is visible if the parameter "Night mode" is set to "Yes". This parameter determines how long the channel shall be switched on during night mode. If during the "on" period a command is received via the objects scene, switching, dimming brighter/darker or dimming value, then that command is executed and the timer for the "on" period is retriggered. After the configured „on" period has expired, the output channel, if the warning function is enabled (via the parameter „warning before switching off"), is dimmed to 50% of the current value for 30 seconds. This is to warn the room user about an imminent switching off. By operating the light switch the channel is immediately dimmed to the switching on value and the timer is retriggered.	

07 B0 A2 Dimmer 983901

Parameter	Settings
Warning before switching Off [0...255 Seconds]	**30** (0...255)
This parameter is only visible if the parameter "Night mode" is set to "Yes" or the parameter "Operating mode" is set to "1-level switch time mode". This parameter determines for a channel in night mode or in 1-level time switch mode, how long after the timer has expired an imminent switching off shall be signaled by reducing the brightness (50% of the current dimming value). When the room user operates the light switch then the lighting is turned on for the period configured for night mode or 1-level switch time mode.	

3.6.2 Objects

This additional object is visible.

Obj	Object name	Function	Type	Flag
3	A, Night mode	On / Off	1 bit 1.003	CW
This object is visible if the parameter "Night mode" is set to "Yes". This object serves to enable or disable "Night mode" for the corresponding channel via the bus. This object can also be sent by a pushbutton, a timer or a building management system, for example. If a logical 1 is received, then the corresponding output is switched to night mode. In "Night mode" the channel can no longer be switched on permanently, but only for a limited time (for example, lighting for cleaning for 30 minutes). If the parameter "Warning before switching OFF" (see "Functions, Objects" parameter window) is set to "Yes", then after the configured time, the dimming value of the channel is set first to 50% of the prior value for safety reasons and then within about 30 seconds it is dimmed darker and the channel switched off. This lets a user of the room know the end of the ON time, and by pressing the light switch again, the lighting will be left ON for a further 30 minutes, for example. If the "Night Mode" object is not used with a channel, then this channel can be switched on permanently.			

3.7 Locking

If the locking object of a channel is set then the values of the objects switching, dimming, dimming value, scene and night mode are not evaluated or transmitted. The object values are updated though.
This means:

- Scenes are not saved or recalled when locking is enabled.
- Switching or dimming commands are not executed.
- A received dimming value is saved and may be used the next time the channel is switched on (parameter setting: switching on "to the last dimming value received")
- When the locking object is reset (value 0) the previously received switching/dimming commands are not executed.
- Already started timers (night mode) continue running while the locking object is enabled and result in switching / dimming actions when the timer period expires. Timers are not retriggered when locking is enabled.

3.7.1 Parameter „Channel A, Functions, Objects"

Parameter	Settings
Blocking object	**No**; Yes
If this parameter is set to "Yes" then a locking object is added, which allows locking or releasing switching and dimming of the channel.	

07 B0 A2 Dimmer 983901

3.7.2 Objects

This additional object is visible.

Obj	Object name	Function	Type	Flag
2	A, Locking	On / Off	1 bit 1.003	CW
This object is only visible if the parameter "Blocking object" is set to "Yes". This object is used to lock (disable) or release (enable) the corresponding channel. If the locking object of a channel is set then the values of the objects switching, dimming, dimming value, scene and night mode are not evaluated or transmitted. The object values are updated though. Already started timers continue running while the locking object is enabled and result in switching / dimming actions when the timer period expires. Timers are not retriggered when locking is enabled.				

3.8 Status messaging

The status objects for switching and dimming value contain the current output status of the actuator channel.
If the current dimming value is zero (0) then the switching status is also set to zero (OFF).
In the operating mode flashing the value of the switching status object is set to 1 (ON) as long as flashing is on. If flashing is switched off the value is set to OFF.

The bus load generated by automatically sending status object values on change of state or on bus voltage recovery can be limited with the two parameters "Transmission blocking period for status objects after supply/ bus voltage recovery" and "Delay status objects". Both parameters affect all status objects of the channel. With e.g. a delayed sending of 0.2 seconds, if the switching status was transmitted, the status of the dimming value is sent the earliest after 0.2 seconds.
Only for the status object "dimming value" an additional parameter "Idle period" is visible to limit an unnecessarily high bus load due to dimming value status telegrams directly following each other during a dimming action.

3.8.1 Parameter „Channel A, Functions, Objects"

Parameter	Settings
Status object switching	send on read request only; send on change and on read request; **No**
This parameter determines if a communication object "Status switching" shall be added and when the status object value is to be sent. If "send on change and on read request" is selected, each change of state is transmitted. If "send on read request only" is selected, the status is not sent automatically.	
Status object dimming	send on read request only; send on change and on read request; **No**
This parameter determines if a communication object "Status dimming value" shall be added and when the status object value is to be sent. If "send on change and on read request" is selected, each change of state is transmitted. If "send on read request only" is selected, the status is not sent automatically.	
Idle Period [in seconds]	**3** (1…60)
This parameter is only visible if the parameter "Status object dimming" is set to "send on change and read request". This parameter determines the idle period between dimming value status telegrams to limit an unnecessarily high bus load due to dimming value status telegrams directly following each other during a dimming action.	

07 B0 A2 Dimmer 983901

3.8.2 Objects

These additional objects are visible.

Obj	Object name	Function	Type	Flag
8	A, Status switching	On / Off	1 bit 1.001	CRT
This object is visible if the parameter "Status object switching" is set to "Yes". Depending on the selected parameter setting, this object is used to query the switching status of the channel and if configured to send it automatically after a change. The number of dimming value status telegrams can be limited with the parameter "Delay status objects".				
9	A, Status dimming value	8-bit value	1 Byte 5.001	CRT
This object is visible if the parameter "Status object dimming" is set to "Yes". Depending on the selected parameter setting, this object is used to query the current dimming state (dimming value) of the channel and if configured to send it automatically after a change of value. The number of dimming value status telegrams can be limited with the parameter "Transmission blocking period for status objects after supply/bus voltage recovery". The number of dimming value status telegrams can be limited with the parameter "Delay status objects".				

3.9 Switching cycles counter

Switching cycle counting enables monitoring of the connected load.
The counter is incremented with each change from "Off" to "On". In case of warning before switching off, each switching (flashing) is counted. If switching is configured in case of bus power failure and if with this switching the switching cycle threshold is exceeded, then this is transmitted after bus power recovery.
The object "Exceeding switching cycles threshold" is only transmitted (once) on change of value. If a new threshold is received or the switching cycle counter is reset then the value of the object "Exceeding switching cycles threshold" is only transmitted on change of value of this object.
When the counter object has reached its maximum possible value (4 294 967 295) then its value is retained until it is reset.
The value is reset by writing a value to the object for the (current) switching cycle value.
On bus voltage failure the values of all three objects for switching cycle counting are saved in order to restore them on bus voltage recovery.
The object "A, switching cycle counter" is not to be reset by a download, only the objects "A, switching cycle threshold" and "A, switching cycle threshold overrun" are reset by a download.

07 B0 A2 Dimmer 983901

3.9.1 Parameter „Channel A, Functions, Objects"

Parameter	Settings
Counting of switching cycles	**No;** No limit monitoring; with limit monitoring, with limit monitoring and automatic notification
This parameter enables counting of switching cycles (i.e. how often an output has been switched on and off again) for the corresponding output. If the parameter is set to "without threshold monitoring", then only the communication object "Switching cycle, counter value" is added to this output. If the parameter is set to "with threshold monitoring", then the communication object "Switching cycle, threshold", which prescribes a threshold and the communication object "A Exceeding switching cycles threshold", which reports the attaining or exceeding of the prescribed threshold, are also added. If the parameter is set to "with threshold monitoring and automatic notification", then the value of the object "Switching cycle, threshold overrun" is transmitted automatically.	

3.9.2 Objects

These additional objects are visible.

Obj	Object name	Function	Type	Flag
10	A, Switching cycle, counter value	4-byte value	4 Byte 12.001	CR
This object is visible if the parameter "Counting of switching cycles" is not set to "No" Via this object the number of switching cycles for the output channel (1 switching cycle = switch output on and off again) can be read at any time via the bus.				
11	A, Switching cycle, threshold	4-byte value	4 Byte 12.001	CRW
This object is visible if the parameter "Counting of switching cycles" is set to "with limit monitoring" or "with limit monitoring and automatic notification". Via this object the threshold for the switching cycle count for the output can be sent as an integer value between 1 and 4,294,967,295 to the switching actuator via the bus.				
12	A, Switching cycle, threshold overrun	1 = yes / 0 = no	1 bit 1.002	CRT
This object is only available if the parameter "Counting of switching cycles" in the "A Functions, Objects" parameter window is set to "with threshold monitoring" or "with threshold monitoring and automatic notification". Via this object the attaining or exceeding of the relevant switching cycle count threshold is reported via the bus respectively it can be queried whether the threshold is being exceeded.				

07 B0 A2 Dimmer 983901

3.10 Power-on / Operating hours counter

Counting Power-on / operating hours enables monitoring of the connected load.
The power-on hours are counted while the switching status of the channel is "On". Counting is active when the relay configured as normally open is closed respectively when the relay configured as normally closed is open. Only full seconds are counted. The value of the object "Power-on hours, couvalue" is incremented by one when 3,600 seconds have been counted.
The object "Power-on hours, threshold overrun" is only transmitted (once) on change of value. If a new threshold is received or the power-on hours counter is reset then the value of the object "Power-on hours, threshold overrun" is only transmitted on change of value of this object. When the counter object has reached its maximum possible value (4 294 967 295) then its value is retained until it is reset.
The value is reset by writing a value to the object for the (current) switching cycle value.
Power-on hours cannot be counted on bus voltage failure.
On bus voltage failure the values of all three objects for switching cycle counting are saved in order to restore them on bus voltage recovery.
The object "Power-on hours, counter value" is not to be reset by a download, only the objects "Power-on hours, threshold" and "Power-on hours, threshold overrun" are reset by a download.

3.10.1 Parameter „Channel A, Functions, Objects"

Parameter	Settings
Counting of power-on hours	**No;** No limit monitoring; with limit monitoring, with limit monitoring and automatic notification
This parameter enables counting of power-on hours (i.e. for how many hours the output was switched on) for the output channel. If the parameter is set to "without threshold monitoring", then only the communication object " Power-on hours, counter value " is added to this output. If the parameter is set to "with threshold monitoring", then the communication object "Power-on hours, counter value", which prescribes a threshold and the communication object "Power-on hours, threshold overrun", which reports the attaining or exceeding of the prescribed threshold, are also added. If the parameter is set to "with threshold monitoring and automatic notification", then the value of the object "Power-on hours, threshold overrun" is transmitted automatically.	

3.10.2 Objects

These additional objects are visible.

Obj	Object name	Function	Type	Flag
13	A, Power-on hours, counter value	4-byte value	4 Byte 12.001	CR
This object is visible if the parameter "Counting of Power-on hours" is not set to "No" Via this object the current number of Power-on hours for the relevant output (i.e. how many hours the output was ON) can be queried via the bus at any time.				
14	A, Power-on hours, threshold	4-byte value	4 Byte 12.001	CRW
This object is visible if the parameter "Counting of power-on hours" is set to "with threshold monitoring" or "with threshold monitoring and automatic notification". Via these objects the threshold for the power-on hours count for the relevant output is sent as an integer value between 1 and 4,294,967,295 to the switching actuator via the bus.				
15	A, Power-on hours, threshold overrun	1 = yes / 0 = no	1 bit 1.002	CRT
This object is only available if the parameter "Counting of power-on hours" in the "A Functions, Objects" parameter window is set to "with threshold monitoring" or "with threshold monitoring and automatic notification". This object reports attaining or exceeding the relevant power-on hours count threshold or interrogate via the bus whether a threshold is being exceeded.				

07 B0 A2 Dimmer 983901

3.11 Scene control

The "8-bit scene recall / save" function enables the user to change the characteristics of a preset scene stored in scene controllers for 8 bit scene control or in actuators with integrated 8 bit scene control, i.e. the user can change brightness levels and switching states of the groups within a scene, without changing the configuration using the ETS.
There is one communication object for transmitting the commands for saving the 8-bit scene and recalling the saved scene using the target scene number.
Before saving a scene the actuators belonging to that scene must be set to the desired light levels and switching states. When receiving a save telegram scene controllers or actuators with 8-bit scene function are commanded to interrogate the current light levels and switching states of the actuators and save these as scene settings.
The scenes refer to the object value of the switching object. When a scene is recalled then the associated value (On / Off) is internally written to the switching object as if an external telegram had been received. The actuator acts as if a switching message had been received via the bus. When a scene is saved the current value of the switching object is saved.

Note: If a scene is recalled before the corresponding values have been saved then there is no reaction to that scene recall.

3.11.1 Parameter „Channel A, Functions, Objects"

Parameter	Settings
8-bit scene control	**No;** Yes
Use this parameter to set whether the 8-bit scene control incorporated in the switching actuator is to be enabled. If so, the corresponding communication object and the parameter window "A Scenes" are added for assignment of up to 8 scene numbers per output.	

3.11.2 Parameter „Channel A, Scenes"

Parameter	Settings
8-bit scenes configurable by user	No; **Yes**
This parameter determines if scenes can be configured by the user (via a scene telegram) at run time.	
Assignment 1 to scene [1...64] (0=not used)	**0** (0…64)
This parameter assigns the output of the actuator to an 8-bit scene with a number in the range of 1 to 64. „0" means that the specific assignment is not used. Note: If a scene is recalled before the corresponding values have been saved then there is no reaction to that scene recall.	
Dimming time [0...255 seconds]	**2** (0…255)
This parameter determines the time after which, when the scene is recalled, dimming from the current dimming value to the new value shall be completed.	
Delete saved scene value	**No;** Yes
If this parameter is set to "No" then a scene already saved in the device is retained even after a configuration with ETS. If this parameter is set to "Yes" then a scene already saved in the device is deleted. If the parameter "8-bit scenes configurable by user" is set to "No" then this parameter is not visible and the scene already saved in the device is always deleted.	

07 B0 A2 Dimmer 983901

Parameter	Settings
Predefine	**No**; Yes
If this parameter is set to "No" then the scene settings must first be saved in the installation before the scene can be used. If this parameter is set to "Yes" then the scene can be preset using the following parameter "dimming value". If the parameter "8-bit scenes configurable by user" is set to "No" then this parameter is not visible and the scene values must always be preset.	
Dimming value [0...100%]	**100** (0...100)
This parameter determines the dimming value of a preset scene.	

and so on until scene assignment 8.

3.11.3 Objects

This additional object is visible.

Obj	Object name	Function	Type	Flag
1	A, 8-bit scene	recall / save	1 Byte 17.001	CW
This object recalls (i.e. restores) or programs (stores) the 8-bit scene with the number x. Bits 0...5 contain (in binary code) the number x of the wanted scene as a decimal number between 1 and 64 (in which the decimal number 1 corresponds to the binary number 0, the decimal number 2 corresponds to the binary number 1, etc.). If bit 7 is set to logical 1, then scene x is programmed and if bit 7 is set to logical 0, then scene x is recalled. Bit 6 must be set to logical 0.				

07 B0 A2 Dimmer 983901

4 Addition

4.1 Behavior on bus voltage recovery depending on the operation mode

On bus voltage recovery the parameters for switching on delay / switching off delay are not obeyed.
Locking object and night object are set to OFF.

Parameter: Behavior on bus voltage recovery	Operating mode	Switching behavior
switching off	Normal mode	switch permanently OFF
	1-level time switch mode	
	2-level time switch mode	
	Flashing	
switching on	Normal mode	switch permanently ON
	1-level time switch mode	Start switching on and timer
	2-level time switch mode	Start switching on and timer
	Flashing	Switch flashing ON
as before voltage failure	Normal mode	set permanently to last dimming value before bus voltage failure
	1-level time switch mode	Start timer with last dimming value before bus voltage failure
	2-level time switch mode	Start timer with last dimming value before bus voltage failure
	Flashing	Switch flashing ON, if ON before bus voltage failure respectively Switch flashing OFF, if OFF before bus voltage failure
Parameter dimming value at power voltage recovery	Normal mode	set permanently to parameter dimming value on bus voltage recovery
	1-level time switch mode	Start timer with parameter dimming value on bus voltage recovery
	2-level time switch mode	Start timer with parameter dimming value on bus voltage recovery
	Flashing	Switch flashing ON, if ON before bus voltage failure respectively Switch flashing OFF, if OFF before bus voltage failure

Switching speed is determined by parameter “dimming time for switching”.
When switching ON the minimum dimming value is “jumped” to first and then the output is dimmed to the target value with the “dimming time for switching”.
When switching OFF the output value is first dimmed to the minimum dimming value with the “dimming time for switching” and then “jumps” to the target value 0.
On bus voltage recovery and with configuration of the status objects “Sending on change of status and cyclically” the status object values are transmitted automatically.

07 B0 A2 Dimmer 983901

4.2 Behavior on dimming via object "Switching"

Used parameters:

- Starting value
- Dimming time for switching On/Off
- Minimum dimming value
- Maximum dimming value
- ON delay
- OFF delay

The locking object must be set to OFF. After a value was received via the switching object, the switching on delay and switching off delay have to expire first before one of the following evaluations is valid.

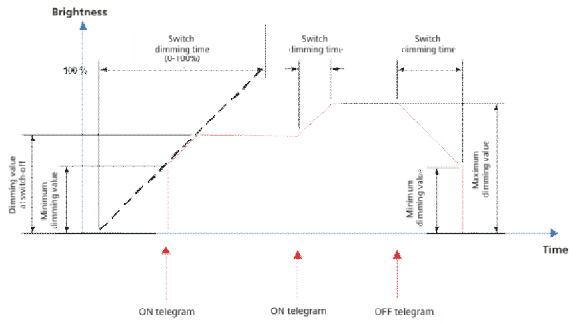
Event: Update switch object	Parameter: „Starting value"	Current dimming value	Reaction / switching behavior
ON	Dimming value at switch-off	0	1. jump to minimum dimming value 2. dim to dimming value before switch-off (when dimming value before switch-off < minimum dimming value => minimum dimming value sustains)
		> 0	1. dim to maximum dimming value
ON	Dimming value at switch-on	0	1. jump to minimum dimming value 2. dim to switch-on value
		> 0	1. dim to switch-on value
	Latest received dimming value	0	1. jump to minimum dimming value 2. dim to last received dimming value (limit accordingly, if it is higher than maximum dimming value or lower than minimum dimming value)
		>0	1. dim to last received dimming value (limit accordingly, if it is higher than maximum dimming value or lower than minimum dimming value)
OFF	n.a (*)	0	stays off
	n.a. (*)	> 0	1. dim to minimum dimming value 2. switch off

(*) n.a. = not applicable

07 B0 A2 Dimmer 983901

4.3 Graphic representation of starting position at different parameterisation

4.3.1 Behaviour at „Switch-on to dimming value at switch-off"



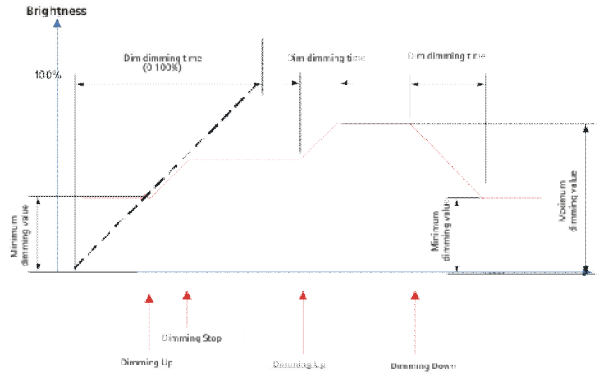
Dimming by switch object
(Starting value = dimming value at switch-off)

The above figure shows the dimming curves for switching on and switching off via the switching object with the configuration "switching on to dimming value at switching off".

4.3.2 Behaviour at dimming via object „relative dimming"

Used parameters

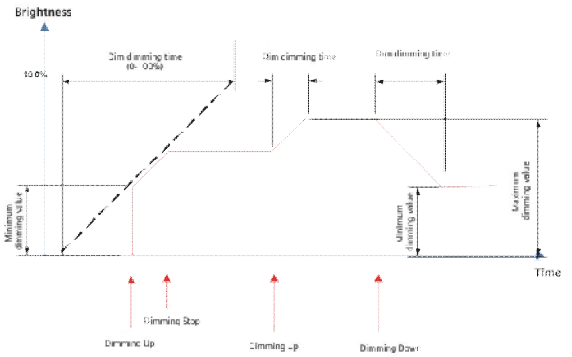
- Switch-on via dimming brighter
- Switch-off via dimming darker
- Dimming time for dimming brighter / darker
- Minimum dimming value
- Maximum dimming value



Dimming by dimming object (no switching possible)

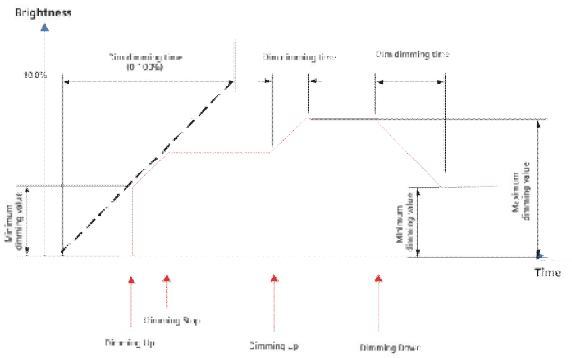
The above figure shows the dimming curves for switching with the configuration:
Switching on via dimming = No
Switching off via dimming = No

07 B0 A2 Dimmer 983901



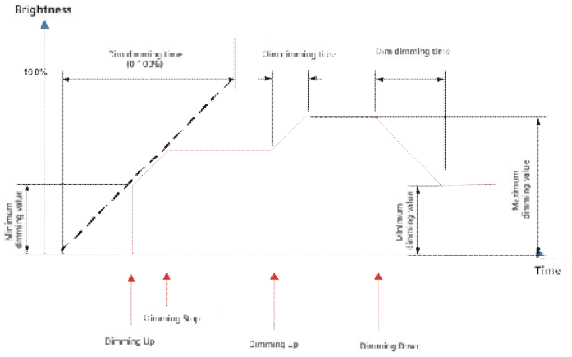
Dimming by dimming object (switch-on possible)

The above figure shows the dimming curves for switching with the configuration:
Switching on via dimming = Yes
Switching off via dimming = No



Dimming by dimming object (switch-off possible)

The above figure shows the dimming curves for switching with the configuration:
Switching on via dimming = No
Switching off via dimming = Yes



Dimming by dimming object (switch-on and -off possible)

The above figure shows the dimming curves for switching with the configuration:
Switching on via dimming = Yes
Switching off via dimming = Yes

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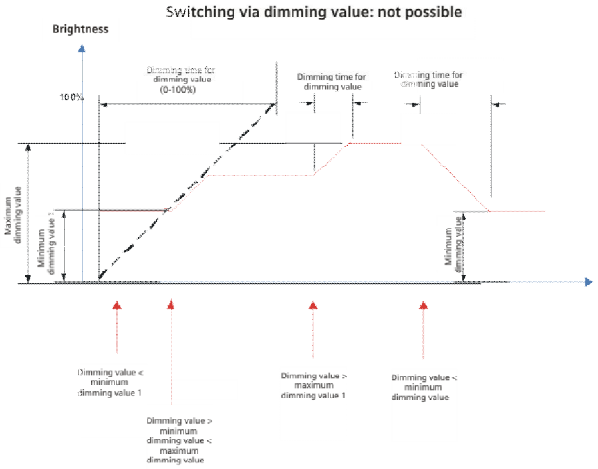
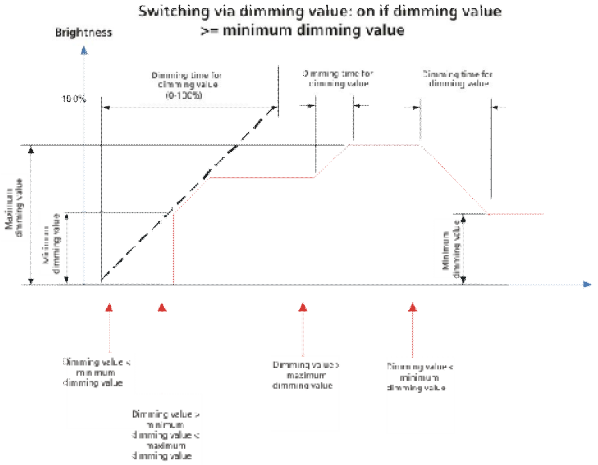
4.3.3 Behaviour at dimming via object „dimming value“

Used parameters:

- Switching via dimming value
- Dimming time for dimming value
- Minimum dimming value
- Maximum dimming value



The above figure shows the dimming curves for dimming with dimming value:
parameter “Switching via dimming value” = “not possible”



The above figure shows the dimming curves for dimming with dimming value:
parameter “Switching via dimming value” = “On if dimming value >= min. dimming value”

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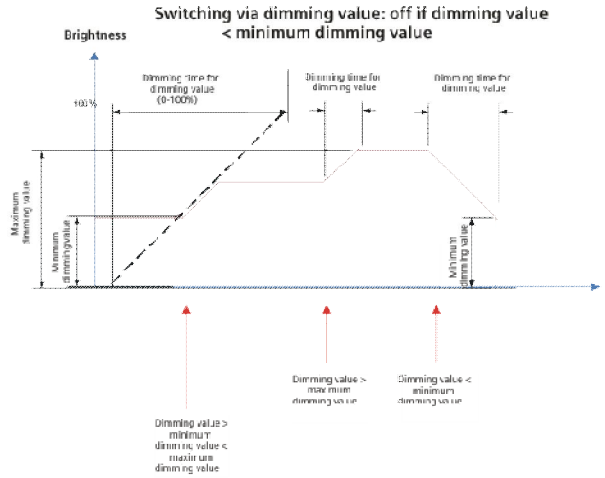
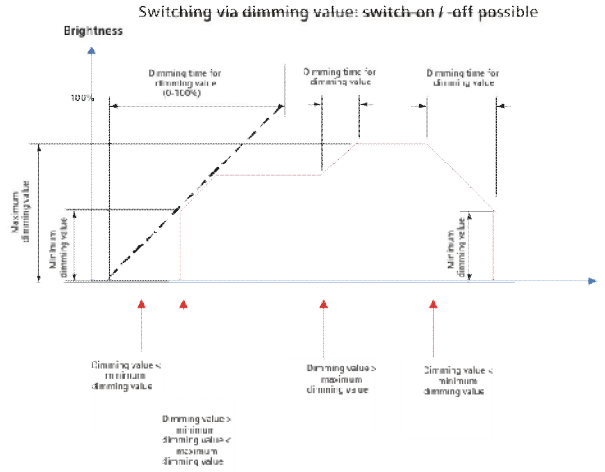


The above figure shows the dimming curves for dimming with dimming value:
parameter "Switching via dimming value" = "Off if dimming value < min. dimming value"



The above figure shows the dimming curves for dimming with dimming value:
parameter "Switching via dimming value" = "Switching On and switching Off possible"

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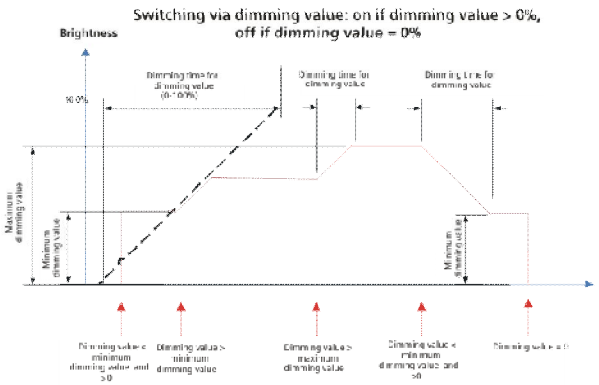

The above figure shows the dimming curves for dimming with dimming value:
parameter “Switching via dimming value” = “On if dimming value > 0% / Off if dimming value = 0%”

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Space for notes