EN

Operation and installation manual

KNX IO 532 (1D1O)

(Art. # 5313)

Combined dimming/switching actuator with 1 LED dimming PWM output and 1 switching output

KNX IO 532 (1D1O)

Application area

The KNX IO 532 (1D1O) is a compact combined dimming/switching actuator with 1 PWM dimming output for LEDs and 1 bi-stable relay output.

The dimming actuator can be used e.g. for LED panels or stripes. Besides controlling the dimmer by switching, rel. dimming and dimming value, several optional functions are integrated, including scenes, automatic, slumber function or staircase light.

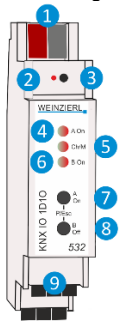
The switching actuator provides the function for universal outputs including scene control, timer, staircase lighting and heating valves (PWM for thermoelectric valve drives).

Two push buttons and three LEDs allow a local operation and a visualization of the device state.

In addition to the output channels the device includes 16 independent functions for logic or timer control.

1. Installation and connection

The KNX IO 532 is designed for installation on a DIN rail (35 mm) with a width of 1 units (18 mm). An installation-friendly design with pluggable screw terminals helps to reduce the cost of commissioning. It features the following controls and displays:



1. *KNX bus connector*
2. *Programming LED*
3. *Button f. programming mode*
4. *LED A/On (multicolor)*
5. *LED Ch/M (multicolor)*
6. *LED B/On (multicolor)*
7. *Button A/On*
8. *Button B/Off*
9. *Pluggable screw terminals*

This device is powered by the KNX bus. An external power supply is not necessary.

The device is not working without bus power.

A. KNX Programming mode

The KNX programming mode is activated/deactivated either by pressing the flushed KNX programming button 3 or by simultaneously pressing the buttons 7 and 8. Accessing the programming mode via the device front buttons can be enabled / disabled via the ETS® by changing the value of Prog. mode on device front.

When the programming mode is active, the programming LED 2 and LED Ch/M 5 light red.

B. Manual operation and status display

The LED Ch/M 5 lights up or flashes if the device is successfully powered by the KNX bus.

Pressing button A 7 long switches to manual operation of the dimming actuator channel (channel A). This is indicated by cyclic, one-time flashing of the LED Ch/M 5 in orange.

Pressing button B 8 long switches to manual operation of the switching actuator channel (channel B). This is indicated by cyclic, two-time flashing of the LED Ch/M 5 in orange.

In manual operation, the respective channel can be switched on by pressing the button On 7 and switched off by pressing button Off 8 short. In addition, the dimming actuator can be dimmed brighter with long button press on 7 and darker with long button press on 8.

The manual operation mode can be exit by pressing the buttons (Esc) 7 and 8 simultaneously.

LED A 4 indicates the status of the dimming actuator. It lights up when the channel is switched on and is off when the channel is switched off. Similarly, LED B 6 indicates the status of the switching actuator (channel B).

Summary of the states of LED Ch/M 5:

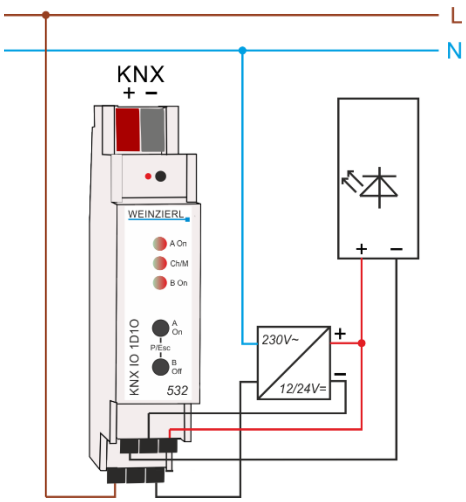
LED Status	Meaning
LED lights green	Device is working in standard operation mode.
LED lights red	Programming mode is active.
LED flashes 1x orange	Programming mode is not active. Manual operation is active, switching/dimming of dimming actuator (channel A) possible.
LED flashes 2x orange	Programming mode is not active. Manual operation is active, switching of switching actuator (channel B) possible.
LED flashes red	Programming mode is not active. Manual operation is not active. The device is not properly loaded, e.g. after an interrupted ETS download.
LED flashes green	The device is currently loaded by the ETS.

2. Reset to factory device settings

It is possible to reset the device to its factory settings:

- Disconnect the KNX Bus connector 1 from device
- Press the KNX programming button 3 and keep it pressed down
- Reconnect the KNX Bus connector 1 of device
- Keep the KNX programming button 3 pressed for at least another 6 seconds
- A short flashing of all LEDs (2 4 5 6) visualizes the successful reset of the device to factory default settings.

3. Wiring scheme



Pluggable screw terminals

Channel A is on the upper terminal and channel B on the lower terminal:

Ch A Out-	Ch A 12..24V -	+
Ch B Out	Ch B !Out	Ch B Cm

Upper terminal

The upper pluggable screw terminals 9 are used to control e.g. LED panels or stripes.
The +12/24V connection of the used power supply unit is connected to the right terminal at the upper screw terminals (12..24V +), at the same time with the anode of the consumer. The ground connection of the power supply unit is connected to the middle terminal (12..24V -). The cathode of the consumer is connected to the left terminal (Ch A Out -).

Lower terminal

The lower pluggable screw terminals 9 are used for the switching actuator, the left terminal pin Ch B Out is used as closer. The central terminal pin Ch B !Out serves as opener. On the right terminal pins Ch B Cm the common pin is contacted e.g. the voltage to be switched.

4. Operating parameters of dimmer channel

Power dissipation

The dimming of luminaires is not possible without a certain power loss in the dimmer. This power dissipation leads to a heating of the device and depends on several factors. In addition to the output of the connected lamps, the current dimming value is also taken into account. Thus, the loss with the luminaire switched off is almost zero except for the leakage current. Even at 100%, the power loss is relatively low and can be traced back to the contact resistance of the output.

Between 0 and 100% the switching losses caused by the PWM are added. Overall, there is a maximum power loss in the upper dimming range.

The rated power of 144W refers to the maximum permitted ambient temperature for free installation. If there are other devices next to the dimming actuator that emit heat, the power that can be connected is reduced. Alternatively, the devices can also be mounted at a small distance (approx. ½ TE = 9 mm). Suitable spacers for the top-hat rail are available on the market for this purpose.

Safety shutdown

The dimming actuator has an electronic fuse for overcurrent and overtemperature. In both error cases, the output is switched off and can be switched on again via a command if the error is no longer present.

In addition, the device is also equipped with fuses against overcurrent and overtemperature. This fuse stage protects connected devices and surrounding materials against severe damage, but leads to failure of the dimming actuator and can no longer be reset.

5. ETS database

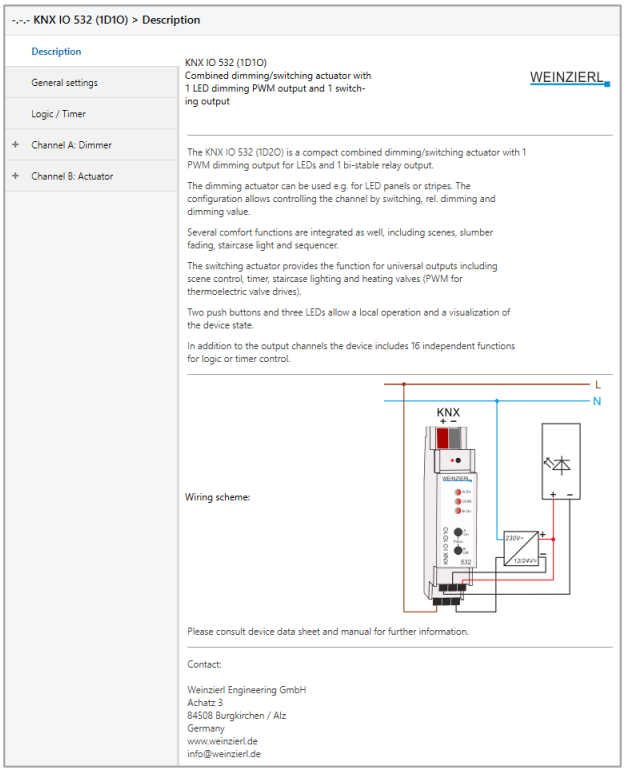
The ETS database (for ETS 4.2 ETS and 5) can be downloaded from the product website of the KNX IO 532 (1D1O) (www.weinzierl.de) or via the KNX online catalogue.

ETS parameter dialog

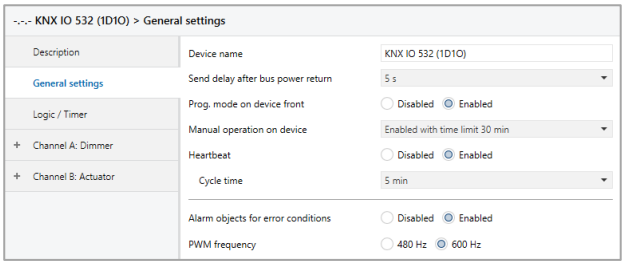
The following pages and parameters are visible in the ETS.

A. Description

This page shows the device description and the associated wiring scheme.



B. General settings



Device name (30 Characters)

An arbitrary name can be assigned for the KNX IO 532 (1D1O). The device name should be meaningful, e.g. „Living Room“. This helps the clarity of the ETS project.

Send delay after bus power return

A send delay of telegrams after the return of the bus voltage can be set via this parameter. In this case, telegrams from the device are sent to the KNX bus in a delayed manner by the set time. This results in a reduction of the bus load at a bus power return. Other functions such as receiving telegrams of switching operations of the actuator are not affected by this parameter.

Prog. mode on device front

In addition to the normal programming button 3 the device allows activating the programming mode on the device front without opening the switchboard cover. The programming mode can be activated and deactivated via pressing simultaneously both buttons 7 and 8.

This feature can be enabled and disabled via the parameter “Prog. mode on device front”. The recessed programming button 3 (next to the Programming LED 2) is always enabled and not influenced by this parameter.

Manual operation on device

This parameter is used to configure the manual operation on the device. The manual operation mode can be disabled or activated (with or without time limitation). The time limit defines the duration until the automatic return from the manual operation mode back into the normal operating mode.

The device is in normal operating mode when the manual control is not active. In the manual operating mode, received switching telegrams are ignored. When the manual operation mode is terminated (after expiry of the time limit or manually), the last state of the outputs remains, until a new switching telegram is received again.

The following options are selectable:

- Disabled
- Enabled with time limit 1 min
- Enabled with time limit 10 min
- Enabled with time limit 30 min
- Enabled without time limit

Heartbeat

Cyclic sending of values to the KNX-Bus, to indicate that the device is operational. For the Cycle time values between 1 min and 24h are selectable.

Group object	Type KNX	Size	Direction
GO 1 Heartbeat - Trigger	1.001	1 Bit	To KNX

Alarm objects for error conditions

With this parameter, the following objects for the visualization of error states become visible:

Group object	Type KNX	Size	Direction
GO 2 Alarm - Overload	1.001	1 Bit	To KNX
GO 3 Alarm - Overtemperature	1.001	1 Bit	To KNX
GO 4 Alarm - No supply voltage	1.001	1 Bit	To KNX

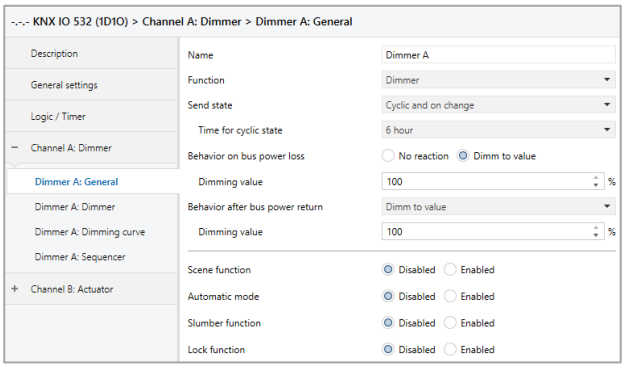
If an error condition is detected, the dimmer output switches off and an ON telegram is sent via the respective object. The output is disabled for the duration of the error state, if it is resolved, the respective object sends an OFF telegram, and the dimmer can be used normally again.

Overload is triggered from a load of 8A, overtemperature from a measured temperature of 85°C in the load section. If no value is received by the load section for longer than 3 seconds, the error state "No supply voltage" is triggered.

PWM frequency

Here can be switched between 480Hz and 600Hz PWM frequency.

C. Dimmer A: General



Name (30 Characters)

An arbitrary name can be assigned for the channel. However, this should be clear and meaningful, this makes it easier to work with the associated group objects, because the given name is displayed there as a label. If no name is assigned, the group objects are named „Dimmer A“.

Function

This parameter defines the functionality of the actuator, the following options are selectable:

- Disabled
- Dimmer
  When this functionality is selected, scene function, automatic mode, slumber and lock function are available. In the "Dimmer" function, objects for switching on/off, relative dimming, dimmer control via dimming and RGB value can be configured. The parameter page "Dimmer A: Dimmer" is displayed.
- Staircase function
  The parameter page "Dimmer A: Staircase function" is displayed. Only the lock function is available here.

When a function is selected, the following parameters appear:

Send state

This parameter defines the behavior of the state objects:

- Disabled
  State objects are deactivated and not displayed.
- Only on read
  State objects send only on request.
- On change
  The switch object sends an OFF telegram when the output value changes to 0%, an ON telegram when the output value changes from 0% to a value greater than 0%. The value object transmits with a time interval of at least 1 second if the value at the output has changed by at least 1% or if a dimming process has been completed.
- Cyclic and on change
  State objects send cyclically and on value change.

Group object	Type KNX	Size	Direction
GO 16 Dimmer A: Dimming output - State On/Off	1.001	1 Bit	To KNX
GO 17 Dimmer A: Dimming output - State value	5.001	1 Byte	To KNX

Time for cyclic state

With this parameter, the cycle time can be set, when “Cyclic and on change“ is selected for sending state.

Behavior on bus power failure

The behavior of the output in the event of bus power failure can be configured here.

The following options are selectable:

- No reaction
- Dim to value
  A parameter for adjusting the value appears.

Behavior after bus power return

Here the behavior of the output after bus power return can be configured. This behavior will be set after every device restart (e.g. also on restart after ETS download).

The following options are selectable:

- No reaction
- Dim to value
  A parameter for adjusting the value appears.
- State like before bus power failure

Scene function

The scene function can be activated or deactivated here; it is only available in the "Dimmer" operating mode. If this function is activated, the parameter page "Dimmer A: Scene function" appears for further configuration of scenes 1-16. The further functionality is explained in section G.

Automatic mode

Automatic mode is only available in the "Dimmer" function. If this mode is selected, the following objects become visible:

Group object	Type KNX	Size	Direction
GO 19 Dimmer A: Automatic Mode - Activate	1.001	1 Bit	From/To KNX
GO 20 Dimmer A: Autom. dimming abs. - Set value	5.001	1 Byte	From KNX

When using automatic mode, the dimmer can be controlled via object 20, e.g. for light control or daylight-dependent basic lighting.

In automatic mode, the dimmer can be manually overridden by dimming on/off, dimming rel., dimming value, scene, slumber function or sequencer. During manual override, values of object 20 are ignored, each manual override restarts the fallback time.

After the fallback time set in the parameter has elapsed, the values received on object 20 are processed again.

Via object 19, the automatic can be switched on or off at any time, it also serves as a state object for automatic mode.

Slumber function

The slumber function is only available in the "Dimmer" operating mode. The slumber function offers 2 different fade times each for switching on and off via object. If this function is activated, a new parameter page appears, which is explained in section H.

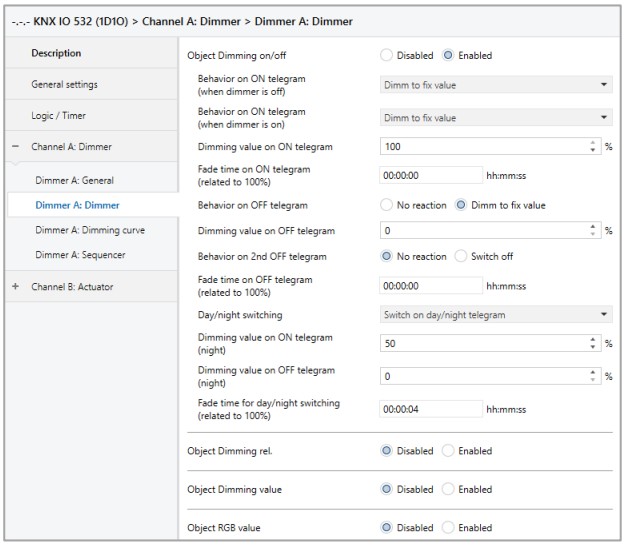
Lock function

The lock function can be activated or deactivated here.

This function is available in both "Dimmer" and "Staircase function" operating modes. If this function is activated, a new parameter page appears for further configuration, which is explained in Section I in more detail.

D. Dimmer A: Dimmer

Object Dimming on/off



For switching the dimmers, the following object is available, if it has been activated via parameters:

Group object	Type KNX	Size	Direction
GO 11 Dimmer A: Dimming on/off - Switch	1.001	1 Bit	From KNX

Behavior on ON telegram (when dimmer is off)

If the dimmer is switched off, this parameter can be used to configure the behavior when switching on via object 11.

It is available:

- No reaction
- Dim to fix value
- Dim to last value before switching off

Behavior on ON telegram (when dimmer is on)

If the dimmer is already switched on, this parameter can be used to configure the behavior for a new ON telegram via object 11.

It is available:

- No reaction
- Dim to fix value
- Dim to fix value if higher than actual

Dimming value on ON telegram

This value is activated by ON telegram via object 11 with suitable parameterization.

Fade time on ON telegram

This fade time is active when an ON telegram is received. The period refers to a complete dimming process of 0-100%.

Behavior on OFF telegram

This parameter describes the behavior of the dimmer when an OFF telegram is sent via object 11.

It is available:

- No reaction
- Dim to fix value

Dimming value on OFF telegram

This value is activated by OFF telegram via object 11 with suitable parameterization.

Behavior on 2. OFF telegram

This parameter describes the behavior of the dimmer when a 2. OFF telegram is received via object 11.

It is available:

- No reaction
- Switch off

The 2. OFF telegram must follow the 1. OFF telegram within 1 second in order to be evaluated. If the current brightness is equal to or lower than the parameterized brightness for OFF telegram, the device is already switched off by the 1. OFF telegram.

Fade time on OFF telegram

This fade time is active when an OFF telegram is received. The period refers to a complete dimming process of 0-100%.

Day/night switching

When using this function, the following objects are visible for switching between day/night mode:

Group object	Type KNX	Size	Direction
GO 15 Dimmer A: Day/Night - Switch	1.001	1 Bit	From KNX

Day mode is triggered with an ON telegram on object 15, night mode with an OFF telegram. After a restart, the device is in day mode.

In addition, it can be determined when the values become active after receiving a telegram on these objects, it is available:

- Disabled
- Switch on day/night telegram
  Immediately after reception of day/night switching, it is dimmed to the active value according to the last switch-on/switch-off received via object 11.
- Switch on next on/off telegram
  The currently active value is not used until the next switch on/off telegram via object 11.

There is a separate switch-on and switch-off value for night mode in the parameters, in day mode the always visible values are used.

Dimming value on ON telegram (night)

If the dimmer is in night mode, this value is activated by ON telegram via object 11 and suitable parameterization.

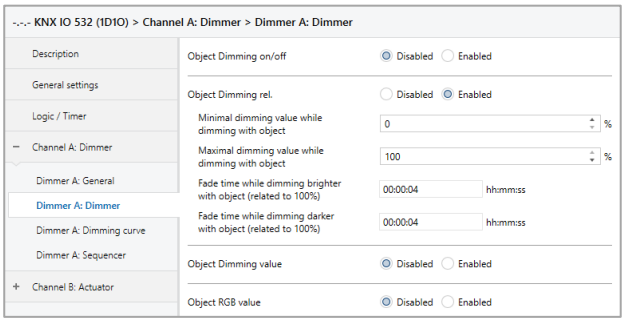
Dimming value on OFF telegram (night)

If the dimmer is in night mode, this value is activated by OFF telegram via object 11 and suitable parameterization.

Fade time for day/night switching

This fade time is only active if switching on day/night telegram is used. If switching on next on/off telegram is used, the regular fade time of the respective on or off telegram is active. The period refers to a complete dimming process of 0-100%.

Object Dimming rel.



The following object is available for dimming using relative dimming commands, if activated via parameters:

Group object	Type KNX	Size	Direction
GO 12 Dimmer A: Dimming rel. - Brighter/Darker	3.007	4 Bit	From KNX

Minimal dimming value while dimming with object

This parameter can be used to set which minimum dimming value can be achieved via relative dimming. If the current dimming value is below the minimum value, the brightness cannot be reduced via object 12.

Maximal dimming value while dimming with object

This parameter can be used to set which maximum dimming value can be achieved via relative dimming. If the current dimming value is above the maximum value, the brightness cannot be increased via object 12.

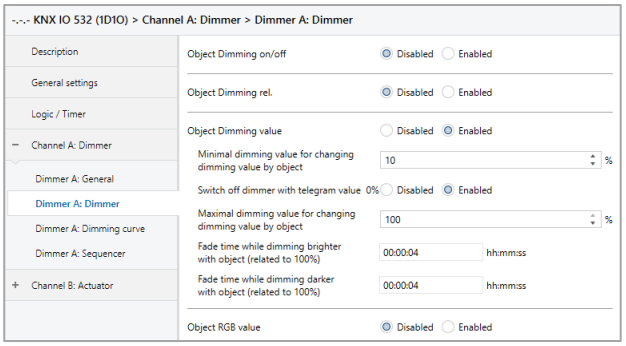
Fade time while dimming brighter with object

This fade time is active when the brightness is increased by relative dimming with object 12. The period refers to a complete dimming process of 0-100%.

Fade time while dimming darker with object

This fade time is active when the brightness is decreased by relative dimming with object 12. The period refers to a complete dimming process of 0-100%.

Object Dimming value



The following object is used to control the dimmer via dimming value if it has been activated via parameters:

Group object	Type KNX	Size	Direction
GO 13 Dimmer A: Dimming abs. - Set value	5.001	1 Byte	From KNX

Minimal dimming value for changing dimming value with object

This parameter can be used to configure which minimum dimming value can be reached via object 13. If a value below the minimum value is received, the dimmer is controlled with the minimum value. If a value >0% is set here, the following parameter is also visible:

Switch off dimmer with telegram value 0%

Here it is to select whether the dimmer is switched off when a value of 0% is received.

Minimal dimming value for changing dimming value with object

This parameter can be used to configure which maximum dimming value can be reached via object 13. If a value above the maximum value is received, the dimmer is controlled with the maximum value.

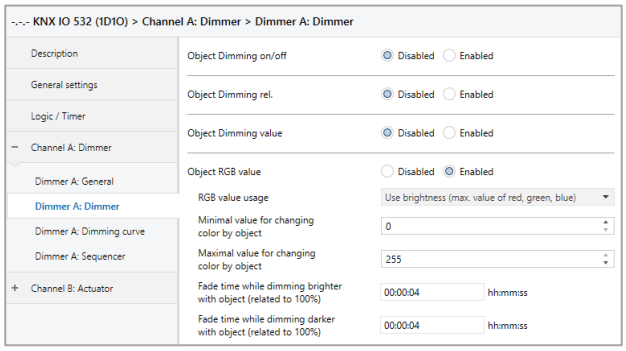
Fade time while dimming brighter with object

This fade time is active when the brightness is increased by relative dimming with object 13. The period refers to a complete dimming process of 0-100%.

Fade time while dimming darker with object

This fade time is active when the brightness is decreased by relative dimming with object 13. The period refers to a complete dimming process of 0-100%.

Object RGB value



To control the dimmer via RGB color value, the following object is available, if activated via parameter:

Group object	Type KNX	Size	Direction
GO 14 Dimmer A: RGB color value - Set value	232.600	3 Byte	From KNX

RGB value usage

Here it is set how a received RGB color value is to be processed:

- Use red part
  The 1. byte of the RGB value (red) is used to control the brightness of the dimmer.
- Use green part
  The 2. byte of the RGB value (green) is used to control the brightness of the dimmer.
- Use blue part
  The 3. byte of the RGB value (blue) is used to control the brightness of the dimmer.
- Use white (min. value of red, green, blue)
  The smallest value of the 3 bytes is used to control the brightness of the dimmer.
- Use brightness (max. value of red, green, blue)
  The largest value of the 3 bytes is used to control the brightness of the dimmer.

Minimal value for changing color by object

This parameter can be used to configure which minimum dimming value can be set via object 14. If a value below the minimum value is received, the dimmer is controlled with the minimal value.

Maximal value for changing color by object

This parameter can be used to configure which maximum dimming value can be set via object 14. If a value above the maximum value is received, the dimmer is controlled with the maximum mal value.

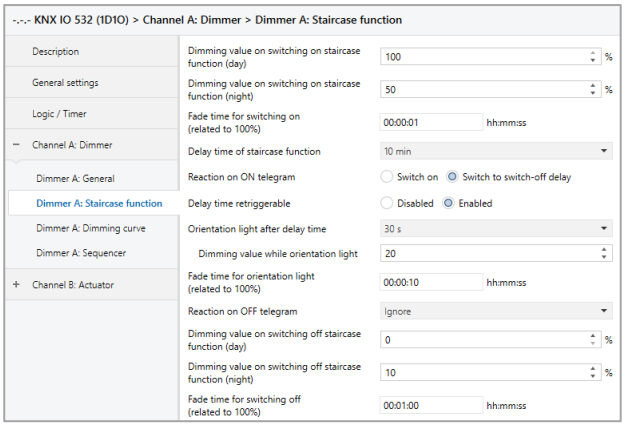
Fade time while dimming brighter with object

This dimming time is active when the brightness is increased by values received via object 14. The time period refers to a complete dimming process of 0-100%.

Fade time while dimming darker with object

This dimming time is active when the brightness is decreased by values received via object 14. The time period refers to a complete dimming process of 0-100%.

E. Dimmer A: Staircase function



This parameter page can be used to implement a staircase function with optional orientation light. The staircase function can be overridden by the lock function. It has the following objects:

Group object	Type KNX	Size	Direction
GO 11 Dimmer A: Staircase function - Trigger	1.010	1 Bit	From KNX
GO 15 Dimmer A: Day/Night - Switch	1.001	1 Bit	From KNX

Day mode is triggered with an ON telegram on object 15, night mode with an OFF telegram. After a restart, the device is in day mode.

Dimming value on switching on the staircase function (day)

This value is used in day mode when the staircase function is switched on via ON telegram to object 11.

Dimming value on switching on the staircase function (night)

This value is used in night operation when the staircase function is switched on via ON telegram to object 11.

Fade time for switching on

This dimming time is active when the staircase function is switched on via ON telegram to object 11. The period refers to a complete dimming process of 0-100%.

Delay time for staircase function

After the delay time has elapsed, the dimmer is dimmed to the switch-off or orientation light value depending on the parameter setting.

Reaction on ON telegram

This parameter determines the behavior after switching on the staircase function via ON telegram on object 11: When "Switch on" is set, the channel remains switched on after ON telegram until the follow-up time is started via OFF telegram. In the setting "Switch to delay time", the channel enters the delay time immediately after the ON telegram.

Delay time retriggerable

If it is set that the delay time is started with ON telegram, this parameter determines whether only the 1. ON telegram on object 11 starts the delay time, or also any further.

If it is set that the delay time is started with OFF telegram, this parameter determines whether only the 1. OFF telegram on object 11 starts the delay time, or also any other if the staircase function is already in the delay time.

Orientation light after delay time

This parameter can be used to set whether the dimmer dims to switch-off value or to orientation light at the end of the delay time, as well as the duration of the orientation light.

It is available:

- Disabled
- 1 s
- 2 s
- 5 s
- 10 s
- 30 s
- 1 min
- 2 min
- 5 min
- 10 min
- 20 min
- 30 min
- 1 h
- 2 h
- Without time limit

Dimming value while orientation light

This value is dimmed to at the end of the delay time when orientation light is used.

Fade time for orientation light

This fade time is active when the staircase function dims to orientation light. The period refers to a complete dimming process of 0-100%.

Reaction on OFF telegram

Here it can be set how the staircase function behaves in the event of an OFF telegram. The following options are available:

- Ignore
  No reaction of the channel on OFF telegram
- Switch off
  Switch to switch-off value from the parameters
- Switch to switch-off delay
  The delay time is started with OFF telegram.
- Switch to orientation light
  The orientation light phase is started with OFF telegram.
- Switch to orientation light/switch off
  With 1. OFF telegram the orientation light phase is started, with 2. OFF telegram it is dimmed to switch-off value.

Dimming value on switching off the staircase function (day)

This value is dimmed to in day mode if the staircase function is switched off after the delay time or via OFF telegram on object 11.

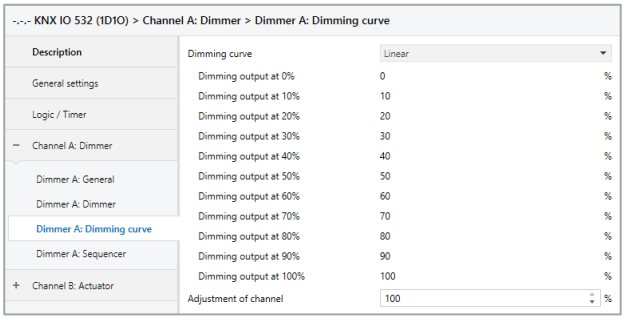
Dimming value on switching off the staircase function (night)

This value is dimmed to in night mode if the staircase function is switched off after the delay time or via OFF telegram on object 11.

Fade time for switching off

This fade time is active when the staircase function dims to the switch-off value. The period refers to a complete dimming process of 0-100%.

F. Dimmer A: Dimming curve



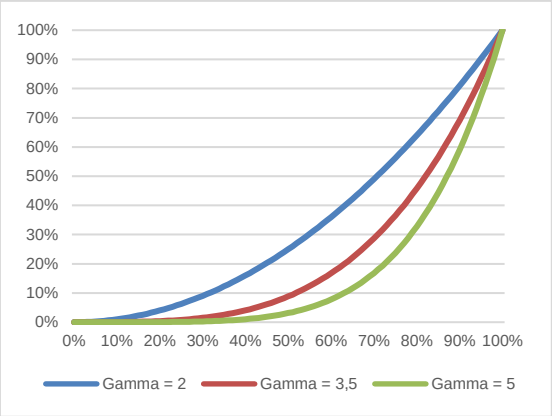
This parameter page is used for fine adjustment of the dimmer to different light sources.

All parameters on this page only affect the PWM value of the output, not the dimming or output status value.

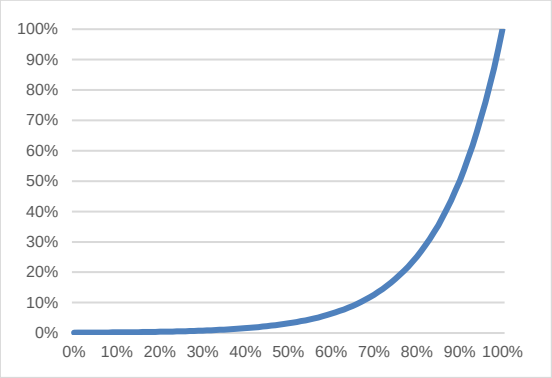
Dimming curve

Here it can be specified which PWM values are output by the dimming outputs when the dimming channel has reached a certain dimming value. The following options are available:

- Linear
- Logarithmic
- User defined
- Gamma
  Gamma correction according to the formula:
  $$\text{PWM value} = \text{Dimming value}^{\text{Gamma}}$$
  Gamma is adjustable via parameter from 1.00 to 5.00.

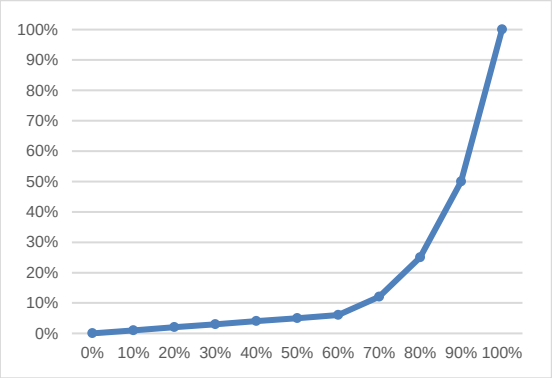


- DALI
  Function based on DALI with the formula:
  $$\text{PWM value} = 10^{3\cdot(\text{Dimming value}-1)}$$



Dimming output at x%

For the "Linear", "Logarithmic" and "User defined" dimming curves, these values determine the PWM values of a dimming output at the specified dimming value. Values between the specified points are calculated and output linearly. As an example, a dimming output with dimming curve "Logarithmic" behaves according to the following graph:



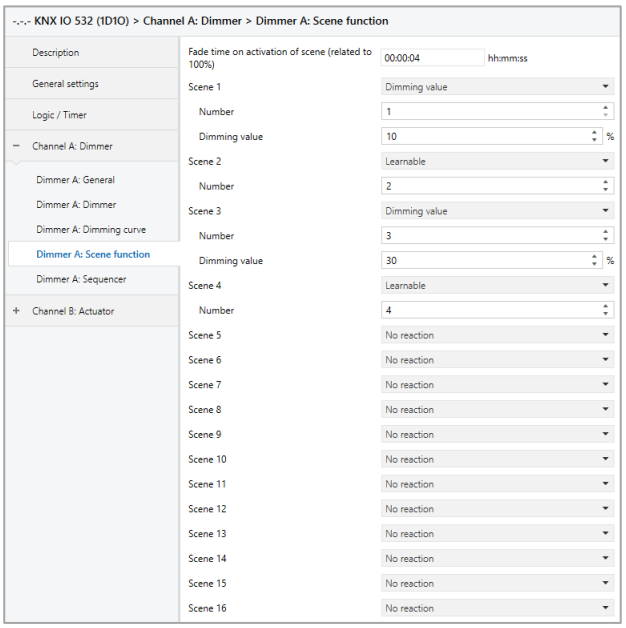
The output values are fixed for the "Linear" and "Logarithmic" dimming curves, and can be freely configured for the "User-defined" curves.

If a dimming value of 0% is reached, the channel always switches off.

Adjustment of channel

The PWM value of the calculated value by the dimming curve is additionally scaled with this value.

G. Dimmer A: Scene function



If the scene function is activated, the following group objects appear:

Group object	Type KNX	Size	Direction
GO 18 Dimmer A: Scene - Activ./Lrn.	18.001	1 Byte	From KNX

Fade time on activation of scene

Here the period can be set in which the received scene is dimmed to. The period refers to a complete dimming process of 0-100%.

Scene 1-16

These parameters can be used to configure the reaction of the channel when the respective scene is received.

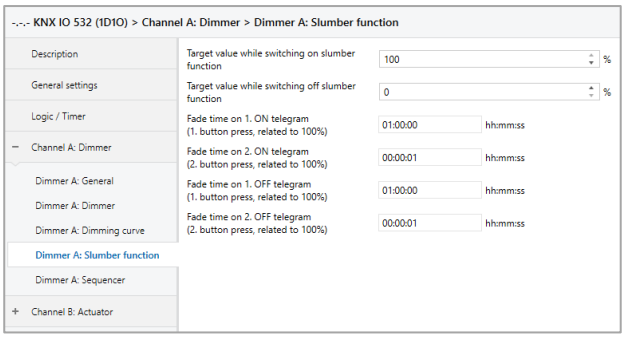
It is available:

- No reaction
- Dimming value
  The output is switched to the set dimming value if the scene of the corresponding number was received.
- Learnable
  With the help of a scene control telegram, the current state at the output for the respective scene can be saved here. Thus the scene can be adapted by the user without ETS download.

Number

With this parameter any scene number between 1 and 64 can be assigned to the scene. No scene numbers may be assigned twice.

H. Dimmer A: Slumber function



If the slumber function is active, the following objects are visible:

Group object	Type KNX	Size	Direction
GO 21 Dimmer A: Slumber function - Trigger	1.001	1 Bit	From KNX

Target value while switching on the slumber function

This value is reached by the channel after completion of the dimming process after receiving an ON telegram via object 21.

Target value while switching off the slumber function

This value is reached by the channel after completion of the dimming process after receiving an OFF telegram via object 21.

Fade time on 1. ON telegram (1. button press)

This fade time is used to dim to the target value for switching on after the 1. button press. The period refers to a complete dimming process of 0-100%.

Fade time on 2. ON telegram (2. button press)

This fade time is used to dim to the target value for switching on after the 2. button press. The period refers to a complete dimming process of 0-100%.

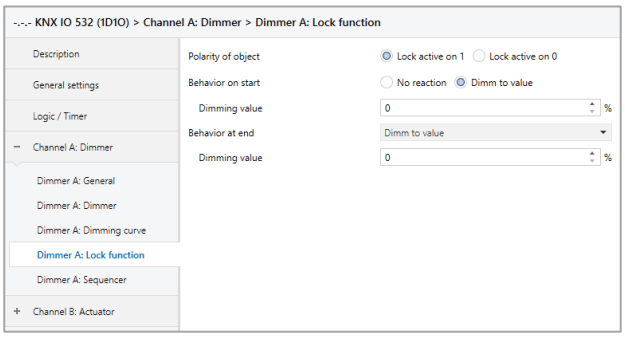
Fade time on 1. OFF telegram (1. button press)

This fade time is used to dim to the target value for switching off after the 1. button press. The period refers to a complete dimming process of 0-100%.

Fade time on 2. OFF telegram (2. button press)

This fade time is used to dim to the target value for switching off after the 2. button press. The period refers to a complete dimming process of 0-100%.

I. Dimmer A: Lock function



If the lock function is activated, the following objects are active:

Group object	Type KNX	Size	Direction
GO 22 Dimmer A: Lock - Activate	1.001	1 Bit	From KNX
GO 23 Dimmer A: Prior. dimming on/off - Switch	1.001	1 Bit	From KNX
GO 24 Dimmer A: Prior. dimming rel. - Brighter/Darker	3.007	4 Bit	From KNX
GO 25 Dimmer A: Prior. dimming abs. - Set value	5.001	1 Byte	From KNX

If the lock was activated by object 22, other received telegrams for dimmer, automatic mode, slumber, scene function and sequencer are not executed.

In addition to the lock object, 3 priority objects become visible when the lock function is activated, with which the dimmer can be controlled independently of the lock. This makes it possible to set an initial state without affecting other functions.

Example of the priority objects:
In the case of events in public buildings or in restaurants, the normal operation can be set into an inoperative state by the lock group object. Thus it is possible to lock during the lecture or concert, switches that are accessible to unauthorized persons, in order to prevent unmeant switching. Nevertheless, the individual lamps can controlled by use of the priority object without canceling the lock.

Polarity of object

This parameter defines, if the lock should be activated by receiving a 1 or by receiving a 0.

The following options are selectable:

- Lock active on 1
- Lock active on 0

Behavior on start

This parameter configures, which state the output should set, if the lock activates.

The following options are selectable:

- No reaction
- Dim to value
  A parameter for adjusting the value appears.

This output state can still be changed by the priority object.

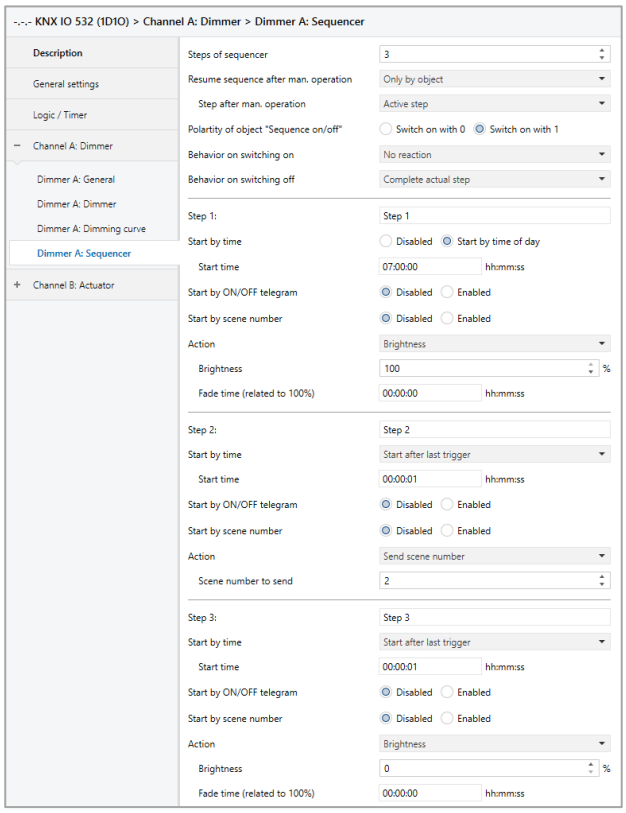
Behavior at end

This parameter defines, which state the output should set, if the lock deactivates.

The following options are selectable:

- No reaction
- Dim to value
  A parameter for adjusting the value appears.
- State before lock
  This restores the original state before the lock was activated. Telegrams received during the lock are ignored.
- State without lock
  Here the state of the last received telegram is restored. This takes into account the received telegrams during the lock. Thus, when the lock is deactivated, the last received telegram is set.

J. Dimmer A: Sequencer



The sequencer can be used to create complex sequence programs consisting of up to 32 individual steps for the dimmer channel. The individual steps can be activated under the following starting conditions:

- At a fixed time of day
- After a waiting time from a previous step has elapsed
- By on/off telegram
- When receiving a parameterized scene number

When a step is activated, a value can be dimmed to or a scene number can be sent, and a step or a whole sequence of steps can be repeated cyclically.

The following objects are available for the general control of the sequencer:

Group object	Type KNX	Size	Direction
GO 33 Dimmer A: Sequence suspend - Suspend/Resume	1.001	1 Bit	From KNX
GO 34 Dimmer A: Sequence on/off - Switch	1.001	1 Bit	From KNX

The following parameters determine the general behavior of the sequencer:

Steps of sequencer

Number of steps (0...32) to be used

Resume sequence after man. operation

An activated sequence can always be interrupted or continued via object 33 an ON telegram interrupts the sequence, and with an OFF telegram it is continued.

A sequence is also interrupted after manual operation, i.e. after commands for dimmer, automatic mode, slumber or scene function.

In addition, this parameter determines how an interrupted sequence can still be continued:

- Only by object
  The sequence can only be continued by object 33.
- After off-time
  The sequence is continued after the set off-time.
- On next activated step
  The sequence is continued with the next activated step, the next step can be activated by object or time-controlled.

Off-time

Only visible if the sequence is to be continued after off-time, with this parameter the off-time can be configured.

Step after man. operation

This step is executed when resuming after manual operation, the function of the set step is always executed, regardless of its otherwise set starting conditions.

Polarity of object “Sequence on/off“

This parameter can be used to set the telegram value with which the sequence can be switched on and off via object 34. If the sequence is switched off, any further activation of a step is disabled.

Behavior on switching on

Here it is determined how the sequencer behaves when switched on by object 34:

- No reaction
  No function is executed, the sequencer waits for steps to be activated.
- Step x
  The function of the step is executed (independent of the other set start conditions of the step), the sequence is then continued according to its configuration from this step onwards.

Switching on also reactivates a sequence interrupted by manual operation.

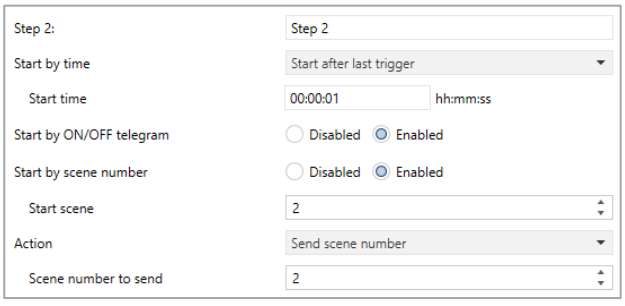
Behavior on switching off

Here it is determined how the sequencer behaves when switched off by object 34:

- Complete actual step
  If the sequencer is in a dimming process, it is completed.
- Step x
  The function of the step is executed (independent of the other set start conditions of the step).
- Stop immediately
  If the sequencer is in a dimming process, it is stopped.

Apart from the set behavior when switching off, any further activation of a step after switching off is disabled until the sequencer is switched on again by object 34.

Step 1-32:



When a step is activated, its parameters for configuration appear.

In the text box at the top right with the content "Step x", you can enter your own name for the step. This designation serves for better orientation of the user and has no influence on the function of the step.

Start by time

This parameter is used to configure a temporal start condition of the step.

- Disabled
  Start condition not used
- Start at a fixed time of day
  Here the time of day at which the step should start can be entered. When using this start condition, the current time must have been received via the following object:

Group object	Type KNX	Size	Direction
GO 5 Time of Day - Set	10.001	3 Byte	From KNX

If no valid time was received by object 5, all start conditions at fixed times of day are not active.

The time is continuously updated by the device through its internal timers, but component tolerances always result in a deviation from the actual time. Therefore, the current time should be sent to the device by a precise timer at least twice a day in order to keep the deviation as small as possible.

- Start after last trigger
  Here you can specify the time interval to wait after the previous activation before executing the step. This start condition is not available for step 1.

Start time

Here either the time day or the waiting time can be specified for the execution of the current step, if a timed start condition is used.

Start by ON/OFF telegram

When using this start condition, a separate object is available for each step:

Group object	Type KNX	Size	Direction
GO 35-66 Dimmer A: Sequence Step x on/off - Switch	1.001	1 Bit	From KNX

An ON telegram to one of these objects activates the respective step, the sequence is then continued according to its configuration from this step onwards.

An OFF telegram also activates this step, but resets the sequence at the same time.

Start by scene number

When using this start condition, the following object becomes visible:

Group object	Type KNX	Size	Direction
GO 31 Dimmer A: Sequence scene - Activate step	18.001	1 Byte	From KNX

A telegram with the set scene on this object activates the respective step, the sequence is then continued according to its configuration from this step onwards.

All steps with this start condition are controlled by this object.

Action

When the step is activated, the configured function is executed, the following functions are available for selection:

- None
  No function is executed, for example this can be used to implement a switch-on delay for a sequence.
- Start loop
  The sequence continues from the selected step. Parameters for the initial step of the loop and the number of loops become visible.
- Send scene number
  When using this function, the following object becomes visible:

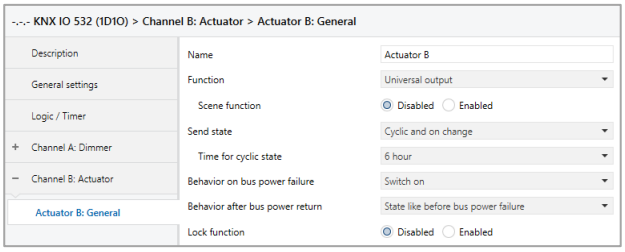
Group object	Type KNX	Size	Direction
GO 32 Dimmer A: Sequence Scene - Send scene	18.001	1 Byte	To KNX

A parameter for the scene number to be sent becomes visible. When the step is activated, this scene number is sent via the object.

All steps send the scene number via this object, if this function is used for the respective step.

- Brightness
  Parameters for brightness and fade time become visible. When this step is activated, the dimmer dims from the current brightness value to the specified brightness with the parameterized fade time. This time is related to a complete dimming process of 0-100%.

K. Actuator B: General



Name (30 Characters)

An arbitrary name can be assigned for the channel. However, this should be clear and meaningful, this makes it easier to work with the associated group objects, because the given name is displayed there as a label. If no name is assigned, the group objects are named “Actuator B: …”.

Function

This parameter defines the functionality of the actuator.

The following options are selectable:

- Disabled
- Switch dimmer
- Universal output
- On/Off delay
- Staircase function
- Valve actuator (PWM for thermal servo)

If the actuator is not “Disabled”, the following parameters are displayed:

Behavior after bus power return

The behavior which is held at the output during the bus power failure can be configured here.

- The following options are selectable:
- No reaction
- Switch on
- Switch off

Behavior after bus power return

Here the behavior of the output after bus power return can be configured. This behavior will be set after every device restart (e.g. also on restart after ETS download).

- The following options are selectable:
- No reaction
- Switch on
- Switch off
- State like before bus power failure

Send state

This parameter defines the behavior of the state objects:

- Disabled
  State objects are deactivated and not displayed
- Only on read
  State objects send only on request
- On change
  State objects send on value change
- Cyclic and on change
  State objects send cyclically and on value change

Group object	Type KNX	Size	Direction
GO 78 Actuator B: Output - State	1.001	1 Bit	To KNX
GO 79 Actuator B: Valve actuator (PWM) - State*	5.001	1 Byte	To KNX

* if valve actuator was selected

Time for cyclic state

Is selected state object “Cyclic and on change“, in this parameter the cycle time can be set.

Lock function

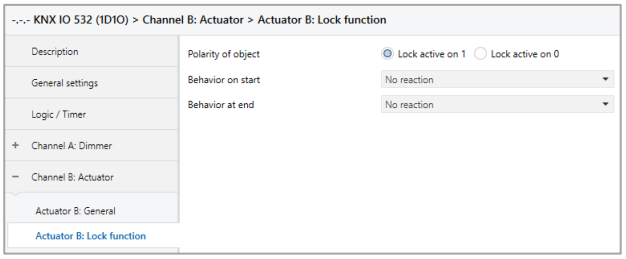
With this parameter the lock function can be enabled. If this functionality is activated, the associated group objects as well as the parameter page “Actuator B: Lock function” are displayed for further configuration. If the lock has been activated via the group object "Lock", the received switching telegrams are not executed.

In addition to the lock object, there is also a priority object, which can be switched independently of the lock. Thus, it is possible to set an output state without affecting other functions.

Group object	Type KNX	Size	Direction
GO 75 Actuator B: Lock - Activate	1.001	1 Bit	From KNX
GO 76 Actuator B: Prior. output - Switch	1.001	1 Bit	From KNX

Example of the priority object:
In the case of events in public buildings or in restaurants, the normal operation can be set into an inoperative state by the lock group object. Thus it is possible to lock during the lecture or concert, switches that are accessible to unauthorized persons, in order to prevent unmeant switching. Nevertheless, the individual lamps can controlled by use of the priority object without canceling the lock.

L. Actuator B: Lock function



Polarity of object

The following options are selectable:

- Lock active on 1
- Lock active on 0

Behavior on start

This parameter configures, which state the output should set, if the lock activates.

The following options are selectable:

- No reaction
- Switch on
- Switch off

This output state can still be changed by the priority object.

Behavior at end

This parameter defines, which state the output should set, if the lock deactivates.

The following options are selectable:

- No reaction
- Switch on
- Switch off
- State before lock
  This restores the original state before the lock was activated. Switching telegrams received during the lock are ignored.
- State without lock
  Here the state of the last received switching telegram is restored. This takes into account the received switching telegrams during the lock. Thus, when the lock is deactivated, the last received switching telegram is set.

Function (Switch dimmer)

In this operating mode, for example a dimmer power supply is switched automatically. With a dimming value of 0% the relay switches off, with a dimming value >0% it switches on. The following parameter is also available:

Delay before switching off the relay

To avoid frequent switching off, a delay time before switching off can be defined here.

Function (Universal output)

If the universal output is selected on the parameter page "Actuator B: General", the actuator can be used as a switching output. A parameter for the scene function is also dis-played.

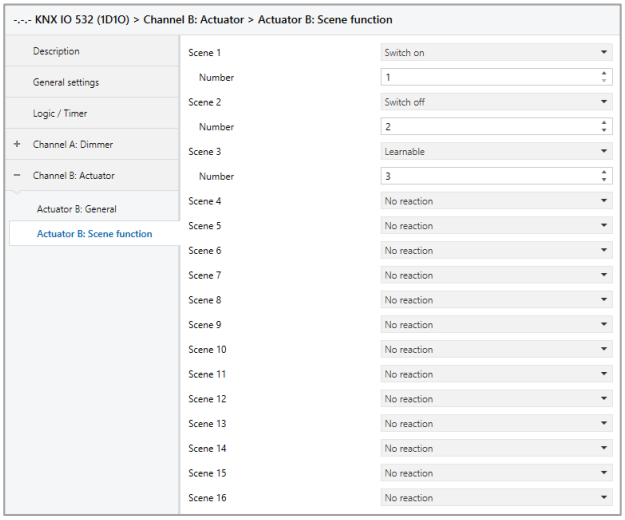
Group object	Type KNX	Size	Direction
GO 71 Actuator A: Output - Switch	1.001	1 Bit	From KNX

Scene function

With this parameter the scene function can be enabled or disabled. If this functionality is enabled, the respective group object as well as the parameter page "Actuator B: Scene function" are displayed for further configuration of scenes 1-16.

Group object	Type KNX	Size	Direction
GO 72 Actuator A: Scene - Activ./Lrn.	18.001	1 Bit	From KNX

M. Actuator B: Scene function



Scene 1-16

These parameters can be used to configure the state, which is set at the output when the respective scene is executed.

The following options are selectable:

- No reaction
- Switch on
- Switch off
- Learnable
  By using a scene control telegram, the current state at the output can be saved for the respective scene. This allows the user to customize the scene without ETS download.

Number

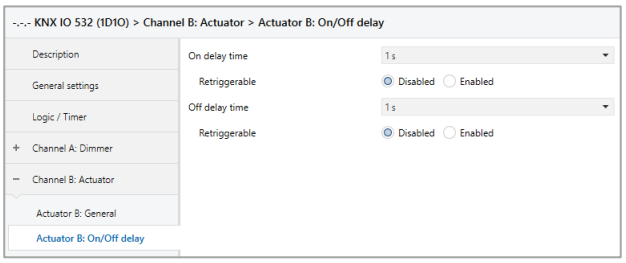
This parameter sets any scene number between 1 and 64 to the scene. There must not configured any scene numbers twice.

Function (On/Off delay)

If the ON/OFF delay is selected on the parameter page "Actuator B: General", delayed switching times can be con-figured. The "Actuator B: On/Off Delay" parameter page is displayed for this purpose.

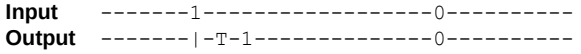
Group object	Type KNX	Size	Direction
GO 71 Actuator B: Output - Switch	1.001	1 Bit	From KNX

N. Actuator B: On/Off delay



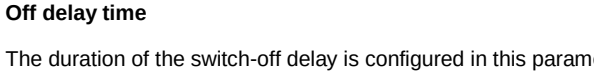
On delay time

The duration of the switch-on delay is configured in this parameter.



Off delay time

The duration of the switch-off delay is configured in this parameter.



Retriggerable

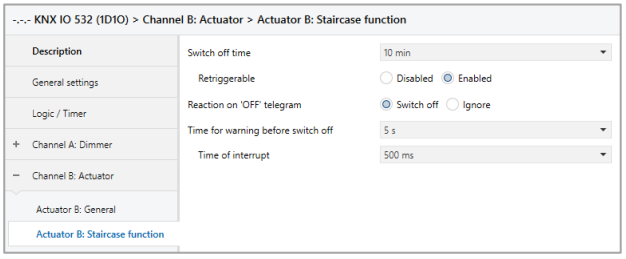
If these parameters are activated, the respective delay time is restarted upon receipt of the corresponding switching signal.

Function (Staircase function)

If the staircase function is selected on the parameter page "Actuator B: General", a group object for the staircase function appears in addition to the normal switching object. Via the additional parameter page "Actuator B: Staircase function" this function can be configured.

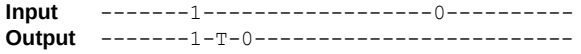
Group object	Type KNX	Size	Direction
GO 71 Actuator B: Output - Switch	1.001	1 Bit	From KNX
GO 73 Actuator B: Staircase function - Trigger	1.010	1 Bit	From KNX

O. Actuator B: Staircase function



Switch off time

The time for which the output is activated after an ON tele-gram (object of the staircase function) has been received, can set in this parameter.



Retriggerable

This parameter can be used to set whether the follow-up time is to be restarted when an ON telegram is received on the object of the staircase function.

Reaction on 'OFF' telegram

This parameter can be used to set whether an OFF telegram on the object of the staircase function should be processed or ignored.

Time for warning before switch off

The time between pre-warning and deactivation is configured, or the pre-warning is deactivated with this parameter. If the pre-warning time is longer than the actual follow-up time, no pre-warning is carried out.

Time of interrupt

The pre-warning is indicated by a brief interruption (switch off -> switch on). The duration of this interrupt is configured in this parameter.

> *LED lamps often have a long follow-up time, in which the lamp still lights even though it is already switched off. With such lamps longer interrupt times must be set to generate a "visible" interruption.*

Function (Valve actuator)

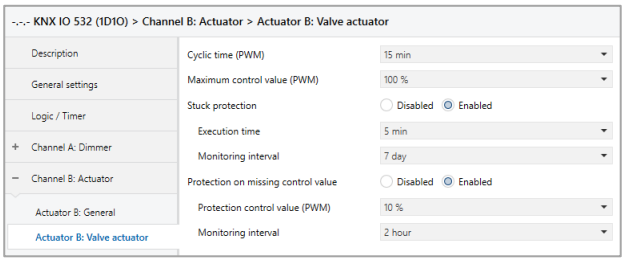
The function valve actuator is foreseen to control thermoelectric valve drives which are used for floor heating but also for radiators. It maps the continuous position (0% - 100%) to an ongoing On/Off sequence called PWM (pulse width modulation) signal.

If the valve actuator is selected on the parameter page "Actuator B: General", a group object for the valve actuator appears instead of the normal switching object. This allows the current PWM at the output to be set via KNX (0% - 100%). An additional parameter page "Actuator B: Valve actuator" appears for the configuration of the valve actuator.

The received control value is saved automatically by the device, to continue faultless after a possible bus power loss.

Group object	Type KNX	Size	Direction
GO 74 Actuator B: Valve actuator (PWM) - Control value	5.001	1 Byte	From KNX

P. Actuator B: Valve actuator



Cyclic time (PWM)

The cyclic time of the PWM, which is used to control a servo drive, is configured with this parameter. One cycle involves a time range in which the output is switched on and one in which the output is switched off. The cyclic time corresponds to the period between two rising edges (state change at the output from OFF to ON). The longer the flow of the heating circuit (tube / pipe length), the higher the cyclic time should be set.

> *Typical thermal servos require several minutes for a 100% valve change.*

Maximum control value (PWM)

This parameter can be used to limit the maximum control value. The control value is expressed in percent and de-fines the period during which the output is switched on in one cycle.

Example:
Cyclic time = 10 Min.
Maximum control value (PWM) = 80 %
Maximal output state = ON - 8 min / OFF - 2 min

Stuck protection

With the stuck protection, it is intended to prevent the valve from being damaged by corrosion or calcification, that it can no longer be moved. In case stuck protection is enabled, this is only triggered if the value is permanently 0 % or 100 %. On every other control value the servo already moves, so there is no need for a stuck protection.

Control value 0% → Open servo for the set time
Control value 100% → Close servo for the set time

In case the valve is not allowed to open, the stuck protection must be disabled.

Execution time

If the stuck protection is activated, this parameter is used to set the duration of the state change.

Monitoring interval

If the stuck protection is activated, this parameter sets the monitoring interval. If the state of the output remains un-changed for this time, the lock protection is triggered.

Protection on missing control value

This parameter enables the protection function on missing control value telegrams. This is necessary in order to prevent unwanted and uncontrolled overheating or cooling down of the room, when the control value is missing.

Protection takes effect, as soon as no telegrams are received from the controller over a longer period of time. As soon as this extended telegram pause has occurred, it can be assumed that the corresponding controller has failed or the connection between the controller and the valve actuator has been interrupted.

Protection control value (PWM)

If the protection on missing control value is enabled, this parameter sets a protection control value. This configured PWM value will set the output, if the protection is active.

As soon as telegrams from the controller are received again, the protection control value (PWM) is overwritten by the received value. The protection does not react again, until the waiting time in the set monitoring interval is exceeded between individual telegrams.

Monitoring interval

If the protection on missing control value is enabled, this parameter sets the monitoring interval. If no further telegram is received by the device during this time, the protection function takes effect.

Lock function (with valve actuator)

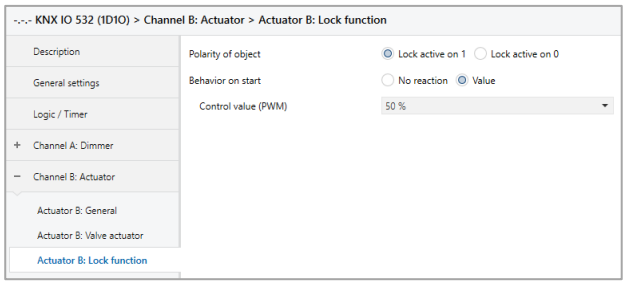
With this parameter the lock function can be disabled or enabled. If this functionality is activated, the associated group objects as well as the parameter page "Actuator 1: Lock function" are displayed for further configuration. If the lock has been activated via the group object "Lock", the received switching telegrams are not executed.

In addition to the lock object, there is also a priority object, which can be used to set a control value independently of the lock. Thus, it is possible to set an output PWM without affecting other functions.

When the lock is ended, the last received value (not priority object) is represented as PWM at the output.

Group object	Type KNX	Size	Direction
GO 75 Actuator B: Lock - Activate	1.001	1 Bit	From KNX
GO 77 Actuator B: Prior. valve actuator (PWM) - Control value	5.001	1 Byte	From KNX

Q. Actuator B: Lock function



Polarity of object

This parameter defines, if the lock should be activated by receiving a 1 or by receiving a 0.

The following options are selectable:

- Lock active on 1
- Lock active on 0

Behavior on start

This parameter defines, which behavior the output should represent, if the lock activates.

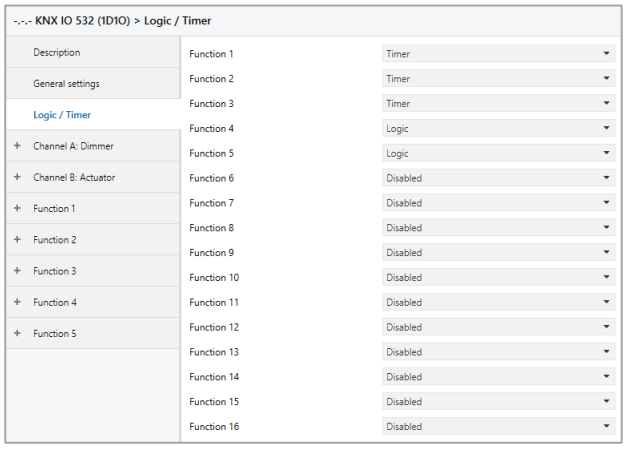
The following options are selectable:

- No reaction
  The PWM value remains as to begin of the lock function.
- Value
  When the lock is activated, a defined PWM value is represented on the output.

Control value (PWM)

If a defined PWM value should be set to the output when the lock is activated, this value can be set with this parameter.

R. Logic / Timer



Function 1 - 16

These channels contain additional functions such as timing and logic. All these 16 additional functions are identical.

The following options are selectable:

- Disabled
- Timer
- Logic

Function type (Disabled)

If the function type is set to "Disabled", no timer or logic specific parameters and group objects are available.

Function type (Timer)

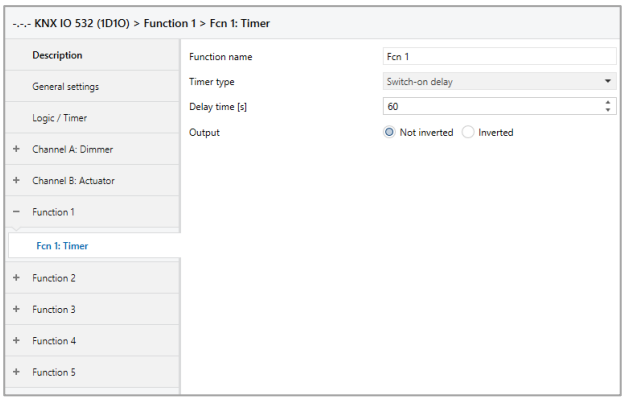
The timer-specific parameters and group objects are available.

Function type (Logic)

The logic-specific parameters and group objects are available.

These additional logic and timer functions can be linked to one another by means of the associated group objects. This also allows to create complex structures. For this purpose, the output of a function is set to the same group address as the input of the next function.

S. Function 1 - 16 (Timer)



Function name (10 Characters)

The function name can be chosen freely.
The name is visible in the group object entry in the ETS software. This makes it easier to work with the associated group objects, because the given name is displayed there as a label.

Timer type (Switch-on delay)

A timer that switches ON after duration defined in ‘Delay time [s]’ parameter.
The output value can be inverted by parameter ‘Output’ (Not inverted / inverted).

Input -------1----------0----------
Output -------|-T-1----------0----------

Group object	Type KNX	Size	Direction
Timer - Switch-on delayed - Input	1.002	1 Bit	From KNX
Timer - Switch-on delayed - Output	1.002	1 Bit	To KNX

Timer type (Switch-off delay)

A timer that switches OFF after duration defined in ‘Delay time [s]’ parameter.
The output value can be inverted by parameter ‘Output’. (Not inverted / inverted)

Input -------1----------0----------
Output -------1----------|-T-0------

Group object	Type KNX	Size	Direction
Timer - Switch-off delayed - Input	1.002	1 Bit	From KNX
Timer - Switch-off delayed - Output	1.002	1 Bit	To KNX

Timer type (Switch-on and -off delay)

A timer that switches ON and OFF after duration defined in ‘Delay time [s]’ parameter.

The output value can be inverted by parameter 'Output'. (Not inverted / inverted)

Input -------1----------0----------
Output -------|-T-1----------|-T-0------

Group object	Type KNX	Size	Direction
Timer - Switch-on/off delayed - Input	1.002	1 Bit	From KNX
Timer - Switch-on/off delayed - Output	1.002	1 Bit	To KNX

Timer type (Impulse (Staircase))

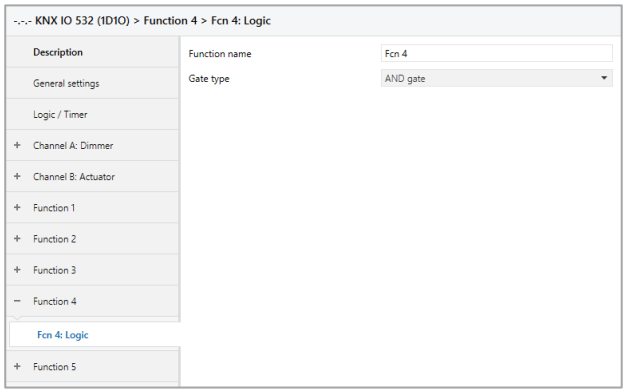
Timer with impulse that - after being switched **ON** - **automatically switches OFF** after a defined duration defined in 'Delay time [s]' parameter.
The output value can be inverted by parameter 'Output'. (Not inverted / inverted)

Input -------1----------0----------
Output -------1-T-0------------------------

Group object	Type KNX	Size	Direction
Timer - Switch-impulse (staircase) - Input	1.002	1 Bit	From KNX
Timer - Switch-impulse (staircase) - Output	1.002	1 Bit	To KNX

Each timer can be stopped by sending the opposite value to its input group object.
For example:
An already started switch on timer can be stopped by sending OFF (0) to its input group object.

T. Function 1 - 16 (Logic)



Function name (10 Characters)

The function name can be chosen freely.
The name is visible in the group object entry in the ETS software. This makes it easier to work with the associated group

Group object	Type KNX	Size	Direction
Logic - Gate input A - Input	1.002	1 Bit	From KNX
Logic - Gate input B - Input	1.002	1 Bit	From KNX
Logic - Gate output - Output	1.002	1 Bit	To KNX

objects, because the given name is displayed there as a label.

Gate type (AND gate)

The output is triggered on (1), if both inputs are switched on (1).

Gate type (OR gate)

The output is triggered on (1), if one or both inputs are switched on (1).

Gate type (XOR gate)

The output is triggered on (1), if the two inputs are not equal.

Gate type (NAND gate)

The output is triggered on (1), if one or both inputs are switched off (0).

Gate type (NOR gate)

The output is triggered on (1), if both inputs are switched off (0).

Gate type (XNOR gate)

The output is triggered on (1), if both inputs are equal.

Gate type (INVERTER)

Input on (1) is converted into output off (0). Input off (0) is converted into output on (1).

Group Object	Type KNX	Size	Direction
Logic - Gate input - Input	1.002	1 Bit	From KNX
Logic - Gate output - Output	1.002	1 Bit	To KNX

WARNING

- The device must be mounted and commissioned by an authorized electrician.
- The prevailing safety rules must be heeded.
- The device must not be opened.
- For planning and construction of electric installations, the relevant guidelines, regulations and standards of the respective country are to be considered.
- The device is a permanently connected equipment: A readily accessible disconnect device shall be incorporated external to the equipment.
- The installation requires a 16 A fuse for external overcurrent protection.
- The power rating is indicated on the side of the product.

ETS4/5 Database
www.weinzierl.de/en/products/532/ets4

Datasheet
www.weinzierl.de/en/products/532/datasheet

CE Declaration
www.weinzierl.de/en/products/532/ce-declaration

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2019/03/05