

Switch Actuator AMS with current measurement

AMS-0416.03

AMS-0816.03

AMS-1216.03

Further Documents:

Datasheet:

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

Assembly and Operation Instructions:

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

Solution Proposals for MDT products:

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

Comparison list MDT Switch Actuators:

https://www.mdt.de/fileadmin/user_upload/user_upload/download/MDT_Overview_Switch_Actuators.pdf

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2 Overview

2.1 Overview devices

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

- **AMS-0416.03** Switch Actuator 4 channel, 4SU MDRC, 16 A, 230 V AC, C-load, standard, 140 μ F, current measurement
- **AMS-0816.03** Switch Actuator 8 channel, 4SU MDRC, 16 A, 230 V AC, C-load, standard, 140 μ F, current measurement
- **AMS-1216.03** Switch Actuator 12 channel, 4SU MDRC, 16 A, 230 V AC, C-load, standard, 140 μ F, current measurement

2.2 Functions

Current measurement

The current value can be output per channel and as total current in milliamperes or amperes. Conversion into watts or kilowatts is possible via the fixed entry of a factor from voltage and $\cos \varphi$.

Current monitoring

Current exceeding and undercutting can be monitored per channel and actions can be triggered as a result. The output object of the monitoring can be “Switching” or “Scene”. By means of an adjustable delay time, the actions can be delayed in the event of an exceedance, undercut and reset. Cyclical sending of the monitoring can be activated. Current exceedance can also be activated in the total current measurement.

Meter function

The AMS switch actuator calculates the energy consumption by means of current measurement and an individual factor from voltage and $\cos \varphi$, which can be entered in the ETS. The output is in Wh or kWh.

Error messages

If a load failure occurs when the contact is closed, or if a fault current occurs when the contact is open, this can be signalled by means of a 1 Bit object.

Switch function

Separate settings for each channel allow, for example, operation as a normally closed or normally open contact, with a switch-on and/or switch-off delay. The status of each channel can be sent cyclically if required. An additional - inverted - status object can be activated.

Threshold function

With the threshold function, for example, the channel can be switched when a temperature or brightness is reached. Various actions can be set for exceeding/undercutting of the threshold value.

Impulse function

Short switching pulses are used, for example, to open or close garage doors. The pulse duration is adjustable and pulses can be repeated once for certain applications.

Extended staircase light function

By pressing the push-button several times, the time in the switch actuator can be added up and the staircase lighting can remain switched on longer as required. Staircase lighting times can be set differently per floor using a 1 Byte object. The pre-warning can flash the push-button LEDs via an object, for example. An actuator channel with staircase lighting function can be used in parallel as a switch channel by means of an additionally activatable switch object.

Extended logic and scene function

The extended logic function links the channel with up to two further logic inputs. AND, OR, XOR and gate functions are available for selection. The logic inputs can be inverted as desired and set to a defined value after bus voltage recovery. This prevents undesired behaviour after a restart. The extended scene function can lock or unlock in addition to switching on or off. Furthermore, saved scenes are retained when the application is reprogrammed.

Operating hours meter

The actuator has an operating hours meter for each channel, which can be reset via a 1 Bit object. Alternatively, a service count down timer can be activated for each channel, which triggers a 1 Bit alarm after previously defined operating hours and sends the remaining time as a 4 Byte object.

Central switch function

The central switch function can be activated per channel. This function enables simple programming of central switch functions. If the communication object of the central function is triggered, all channels with activated central function are switched.

Lock function/ Priority / Forced guidance

In addition to the usual lock function, the switch actuator also offers priority/forced guidance per channel. Priority/forced guidance can be used to switch a channel permanently ON or OFF. The behaviour in the event of bus voltage failure, bus voltage recovery, locking and unlocking or priority can be set differently. A fallback time can be set for the priority function, after which the channel returns to the normal state.

Status objects

The actuators have a status object for each channel with adjustable sending conditions and cyclical sending. In addition, an inverted status object can be activated. This can be used for visualisations or logics.

2.3 Connection diagram

The following figure shows the connection diagram using the 8-channel Switch Actuator as an example:

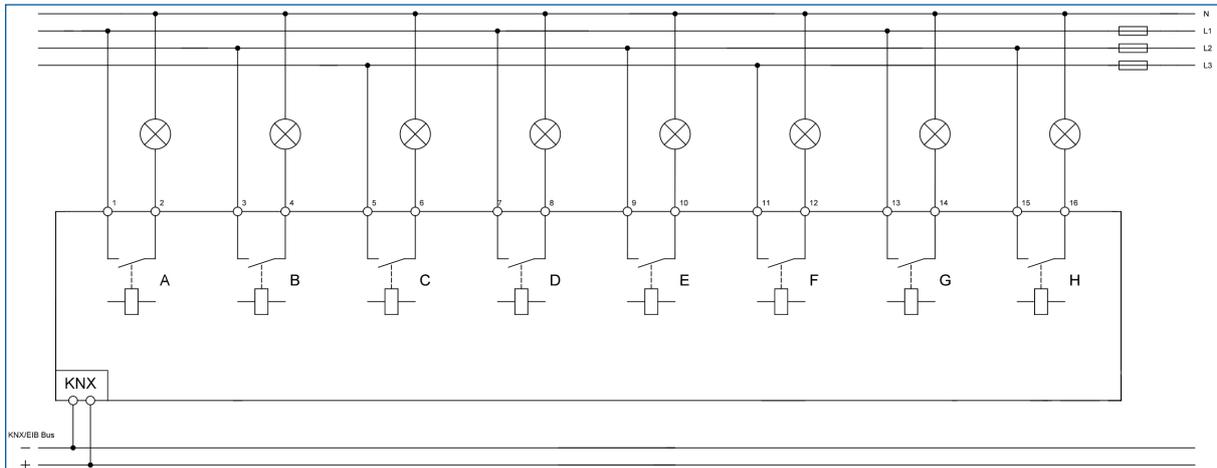


Figure 1: Connection diagram – AMS-0816.03

2.4 Structure & Handling

The following pictures show the structure of the Switch Actuators:

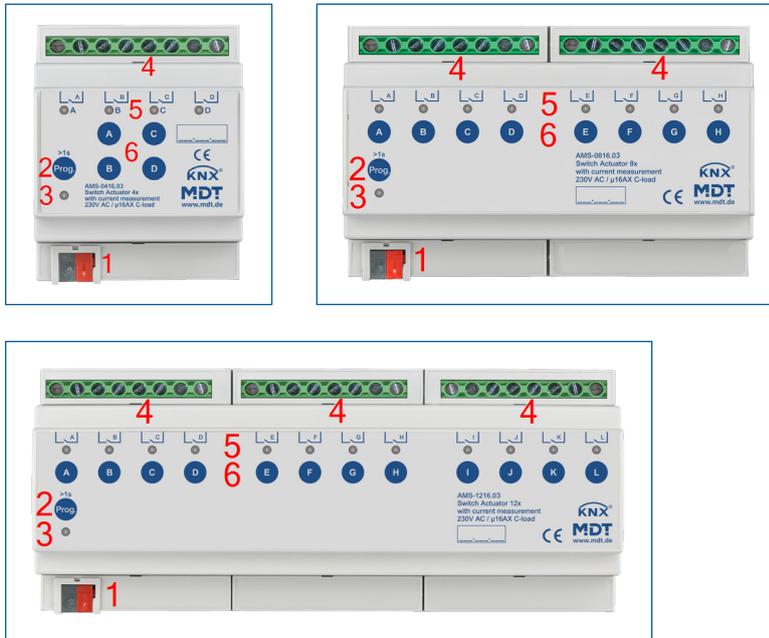


Figure 2: Structure & Handling

- | | |
|---------------------------------|----------------------------------|
| 1 = Bus connecting terminal | 2 = Programming button |
| 3 = Red programming LED | 4 = Connection terminals |
| 5 = Green channel indicator LED | 6 = Buttons for manual operation |

Important note:

The green channel indicator LED on the actuator reflects the status of the status object (“1” = LED On, “0” = LED Off). It does not reflect the state of the relay contact, whether open or closed (important when configured as a “normally closed”).

2.5 Commissioning

1. Wire the device according to the connection diagram.
2. Connect interface to the bus, e.g. MDT USB Interface.
3. Switch on bus voltage.
4. Press the programming button on the device for > 1 s (red programming LED lights up continuously).
5. Set and programme the individual address in the ETS.
(Programming LED turns off)
6. Configure and programme the settings in the application programme.

3 Communication objects

3.1 Standard settings of the communication objects

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

Standard Settings – Channels									
No.	Name	Object Function	Length	C	R	W	T	U	
0	Channel A:	Switch	1 Bit	■		■			
1	Channel A:	Staircase light	1 Bit	■		■			
1	Channel A:	Service required	1 Bit	■	■		■		
1	Channel A:	Switch pulse	1 Bit	■		■			
2	Channel A:	Time until next service	2 Byte	■	■		■		
2	Channel A:	Time until next service	4 Byte	■	■		■		
2	Channel A:	Meter reading: Operating hours	2 Byte	■	■		■		
2	Channel A:	Meter reading: Operating hours	4 Byte	■	■		■		
2	Channel A:	Staircase light with time	1 Byte	■		■			
3	Channel A:	Prewarning	1 Bit	■			■		
3	Channel A:	Reset: Operating hours	1 Bit	■		■			
3	Channel A:	Reset: Service messages	1 Bit	■		■			
4	Channel A:	Lock	1 Bit	■		■			
5	Channel A:	Priority	1 Bit	■		■			
5	Channel A:	Forced guidance	2 Bit	■		■			
6	Channel A:	Scene	1 Byte	■		■			
7	Channel A:	Status	1 Bit	■	■		■		
8	Channel A:	Inverted status	1 Bit	■	■		■		
9	Channel A:	Logic 1	1 Bit	■		■			
10	Channel A:	Logic 2	1 Bit	■		■			
11	Channel A:	Threshold switch	1 Byte	■		■			
11	Channel A:	Threshold switch	2 Byte	■		■			
12	Channel A:	Current value	2 Byte	■	■		■		
12	Channel A:	Current value	4 Byte	■	■		■		
12	Channel A:	Power value	2 Byte	■	■		■		

Standard Settings – Channels								
No.	Name	Object Function	Length	C	R	W	T	U
12	Channel A:	Power value	4 Byte	■	■		■	
13	Channel A:	Current exceedance 1	1 Bit	■	■		■	
13	Channel A:	Current exceedance 1	1 Byte	■	■		■	
14	Channel A:	Current exceedance 2	1 Bit	■	■		■	
14	Channel A:	Current exceedance 2	1 Byte	■	■		■	
15	Channel A:	Current undercut	1 Bit	■	■		■	
15	Channel A:	Current undercut	1 Byte	■	■		■	
16	Channel A:	Residual current	1 Bit	■	■		■	
16	Channel A:	Load failure	1 Bit	■	■		■	
16	Channel A:	Residual current / Load failure	1 Bit	■	■		■	
17	Channel A:	Reset: Meter	1 Bit	■		■		
18	Channel A:	Meter: Power (Wh)	4 Byte	■	■	■	■	
18	Channel A:	Meter: Power (kWh)	4 Byte	■	■	■	■	
+20	next channel							

Table 1: Communication objects – Standard settings: Channels

Standard Settings – Channels								
No.	Name	Object Function	Length	C	R	W	T	U
*	Central function	Switch	1 Bit	■		■		
*	Central function	Lock manual operation	1 Bit	■		■		
*	Central function	In operation	1 Bit	■	■		■	
*	Total current	Current value	2 Byte	■	■		■	
*	Total current	Current value	4 Byte	■	■		■	
*	Total current	Value of total power	2 Byte	■	■		■	
*	Total current	Value of total power	4 Byte	■	■		■	
*	Total current	Exceedance: Switch	1 Bit	■	■		■	
*	Total current	Exceedance: Send scene	1 Byte	■	■		■	
*	Total current	Meter: Total power (Wh)	4 Byte	■	■	■	■	
*	Total current	Meter: Total power (kWh)	4 Byte	■	■	■	■	

Table 2: Communication objects – Standard settings: General objects

* Objects for central functions are always at the end of the object list. Object numbers are thus dependent on the number of channels of each device. For example, the central function “Switch” has the object no. 80 for an AMS-0416.03, but the no. 240 for an AMS-1216.03.

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

By means of “**Consumption meter in the channel writable via object**”, existing meter readings can be transferred - for example when replacing a unit.

By activating the parameter “**Total current / Total current meter**”, all individual channels are recorded by default. Individual channels are deactivated in the settings of the corresponding channel.

Note: All functions of the current and consumption measurements are available approx. 30 seconds after a functional restart of the actuator (after programming or switching on the bus voltage). This also applies to “Consumption meter in the channel writable via object” and “Reset” of the meter readings.

The following table shows the communication objects:

Number	Name / Object function	Length	Usage
*	Central function – Lock manual operation	1 Bit	Locking/unlocking the manual operation
*	Central function – In operation	1 Bit	Send cyclic “In operation” telegram

Table 4: Communication objects – General settings

* Objects for central functions are always at the end of the object list. Object numbers are thus dependent on the number of channels of each unit.

4.1.1 Total current

The submenu “**Total current**” is displayed with activation of the parameter “**Total current / Total current meter**” in the menu “**General settings**”.

The following table shows the selection options:

ETS Text	Dynamic range [Default value]	Comment
Object selection	<ul style="list-style-type: none"> ■ 2 Byte floating value in mA (DPT 9.021) ■ 4 Byte floating value in A (DPT 14.019) ■ 2 Byte floating value in kW (DPT 9.024) ■ 4 Byte floating value in W (DPT 14.056) 	Selection of the datapoint type for the output object of the total current.
Factor for conversion to theoretical power (x): Current value x Factor	100 ... 250 [230]	Input option of a factor from voltage and $\cos \varphi$.
Send value on change of ...	not active 5 % – 75 %	Setting from which percentage change the value is to be sent.
Send cyclically every ...	not active 1 min – 24 h	Setting at which intervals the value is to be sent.
Monitoring of current exceedance	<ul style="list-style-type: none"> ■ not active ■ active, Output: Switch ■ active, Output: Scene 	Activation of the current exceedance and selection of the output object. A detailed description follows in the next chapter!
Total current meter function (Wh/kWh) (theoretical value, sum of the activated current meters per channel)	<ul style="list-style-type: none"> ■ not active ■ active 	Activation / deactivation of the total current meter. (Sum of all activated channel current meters)
Object selection	<ul style="list-style-type: none"> ■ 4 Byte value in Wh (DPT 13.010) ■ 4 Byte value in kWh (DPT 13.013) 	Selection of the datapoint type for the output object of the total current meter.
Send cyclically every ...	not active 1 min – 24 h	Setting at which intervals the value is to be sent.

Table 5: Settings – Total current

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
*	Total current – Current value, Value of total power	2 Byte 4 Byte	Output object for the measured value. DPT depending on the parameter setting.
*	Total current – Meter: Total power (Wh) / (kWh)	4 Byte	Output object of the meter. DPT depending on the parameter setting.

Table 6: Communication objects – Total current

* Objects of the total current functions are always at the end of the object list. Object numbers are therefore dependent on the number of channels of each device.

4.1.1.1 Monitoring of current exceedance

If the parameter “Monitoring of current exceedance” is activated, it is also determined whether a switch command or a scene is to be sent at the output in case of exceedance/withdrawal.

The following table shows the selection options:

ETS Text	Dynamic range [Default value]	Comment
Value range	<ul style="list-style-type: none"> ■ 100 mA – 1000 mA ■ 1 A – 60/90/120 A 	Preselection and limitation of the value range of the exceedance. Values in “A” depending on the number of channels.
Value for exceedance	100 ... 1000 mA [1000] 1 ... 60/90/120 A [20]	Setting of the threshold for exceeding. Unit depends on the set value range.
Send value if exceeded	<ul style="list-style-type: none"> ■ not active ■ value „1“ ■ value „0“ 	Setting the value to be sent when the switching threshold is exceeded. Only with „Output: Switch“.
Send scene if exceeded	not active 1 – 64 [1]	Setting of the scene to be sent when the switching threshold is exceeded. Only with „Output: Scene“.
Value range for withdrawal	<ul style="list-style-type: none"> ■ 100 mA – 1000 mA ■ 1 A – 60/90/120 A 	Preselection and limitation of the value range for withdrawal of exceedance. Values in “A” depending on the number of channels.
Value for withdrawal	100 ... 1000 mA [100] 1 ... 60/90/120 A [10]	Setting the threshold for the withdrawal of the overrun. Unit depends on the set value range.

ETS Text	Dynamic range [Default value]	Comment
Send value on withdrawal	<ul style="list-style-type: none"> ■ not active ■ value „1“ ■ value „0“ 	Setting the value to be sent when falling below the withdrawal threshold. Only with „Output: Switch“.
Send scene on withdrawal	not active 1 – 64 [2]	Setting the scene to be sent when falling below the withdrawal threshold. Only with „Output: Scene“.
Send output cyclically every	not active 1 min – 24 h	Setting at which intervals the value or scene is to be sent.

Table 7: Settings – Current exceedance: Total current

Note: To use this function, the parameter “Add channel to total current” must be active in at least one channel under “Current measurement”.

The “Value range” parameter is used to adjust the setting range of the switching threshold to the expected total current value.

When the individual “Value for exceedance” is overshoot, the “Total current” output object sends - depending on the setting - either the corresponding 1 Bit value or the desired scene number.

When the value falls below the individual “Value for withdrawal”, the output object “Total current” sends - depending on the setting - either the corresponding 1 Bit value or the desired scene number.

Important: To trigger the withdrawal, the current value must have exceeded the switch-on threshold at least once before and the value for exceeding must be greater than the value for withdrawal!

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
*	Total current – Exceedance: Switch, Exceedance: Send scene	1 Bit 1 Byte	Output object for monitoring the total current exceedance. DPT depending on the parameter setting

Table 8: Communication objects – Total current

* Objects of the total current functions are always at the end of the object list. Object numbers are therefore dependent on the number of channels of each device.

4.2 Channel selection

The table shows the possible settings for each channel:

ETS Text	Dynamic Range [Default value]	Comment
Channel A – „X“	<ul style="list-style-type: none">■ not active■ switch■ staircase light■ switch pulse■ switch synchronously with channel	Operating mode of the respective channel.

Table 9: Settings – Channel selection

With the activation of a channel, a submenu appears in which the channel can be configured according to the selection.

The selection options (**switch, staircase light, switch pulse**) are described in the following chapters.

With the selection “switch synchronously with channel A”, the respective channel switches simultaneously with channel A. No parameters for the switch function are shown here, as these are set in channel A. This setting is available from channel B.

Important: The setting is always possible for a maximum of 3 channels. It is thus possible to switch channels B and C synchronously with channel A.

Correspondingly, channels E and F can be switched synchronously with channel D, etc.

With this function, for example, a three-phase motor or a cooker/oven can be directly connected and controlled without an external contactor.

4.3 Identical settings: Description of channel/objects + Additional text

For each channel, two text fields are available for free labelling:

Description of channel/objects	Bathroom
Additional text	Light mirror

Figure 3: Settings – Text fields per channel

Texts with up to 30 characters can be stored for the “Description of channel/objects” field, texts with up to 80 characters can be stored for the “Additional text” field.

The text entered for “**Description of channels/objects**” appears both in the menu for the channel and in the communication objects of the channels.

Channel selection	Number ▲	Name	Object Function
+ Channel A: Bathroom	0	Channel A: Bathroom	Switch
	4	Channel A: Bathroom	Lock

Figure 4: Labelling: Channel and objects

The “**Additional text**” is merely additional information for the programmer. This text is not visible anywhere else.

4.4 Switch

The following settings are available for the channel selection “Switch”:

Description of channel/objects	<input type="text"/>
Additional text	<input type="text"/>
Mode	<input checked="" type="radio"/> normally open <input type="radio"/> normally closed
Switch-on delay	<input type="text" value="0"/> s
Switch-off delay	<input type="text" value="0"/> s
Central function	<input type="radio"/> not active <input checked="" type="radio"/> active
Send status	<input type="text" value="on change"/>
Send status cyclically (0 = not active)	<input type="text" value="0"/> s
Additional inverted status	<input checked="" type="radio"/> not active <input type="radio"/> active
<hr/>	
Behaviour on locking	<input type="text" value="no change"/>
Behaviour on unlocking	<input type="text" value="no change"/>
Priority / Forced guidance	<input type="text" value="1 Bit priority ON"/>
Fallback time for priority (0 = not active)	<input type="text" value="0"/> min
Behavior after deactivation of priority	<input type="text" value="no change"/>
Behaviour on bus power return	<input type="text" value="no change"/>
Behaviour on bus power failure	<input type="text" value="no change"/>
<hr/>	
Logic	<input checked="" type="radio"/> not active <input type="radio"/> active
Scenes	<input checked="" type="radio"/> not active <input type="radio"/> active
Threshold switch	<input checked="" type="radio"/> not active <input type="radio"/> active
Operating hours meter	<input checked="" type="radio"/> not active <input type="radio"/> active
Current measurement	<input checked="" type="radio"/> not active <input type="radio"/> active

Figure 5: Settings – Channel selection: Switch

The individual settings are described in the following chapters.

Information on “**Description of channel/objects**” and “**Additional text**”,
see [4.3 Identical settings: Description of channel/objects + Additional text](#)

Activation of “**Logic, Scenes, Threshold switch, Operating hours meter and Current measurement**”
creates a new sub-menu in each case. These are also described separately below.

4.4.1 Relay operating mode

The table shows the possible settings:

ETS Text	Dynamic Range [Default value]	Comment
Mode	<ul style="list-style-type: none"> ■ normally open ■ normally closed 	Relay operating mode of the respective channel.

Table 10: Settings – Relay operating mode

The operating **mode** determines whether a relay is operated as a “normally open” or “normally closed” contact. This means whether the relay is activated with a “1” or with a “0”.

Important note: The green channel indicator LED on the actuator reflects the status of the status object (“1” = LED On, “0” = LED Off). It does not reflect the state of the relay contact, whether open or closed (important when configured as a “normally closed”).

The following diagram shows the behaviour of a relay - in the operating mode as a normally open contact or as a normally closed contact - in response to a KNX telegram:

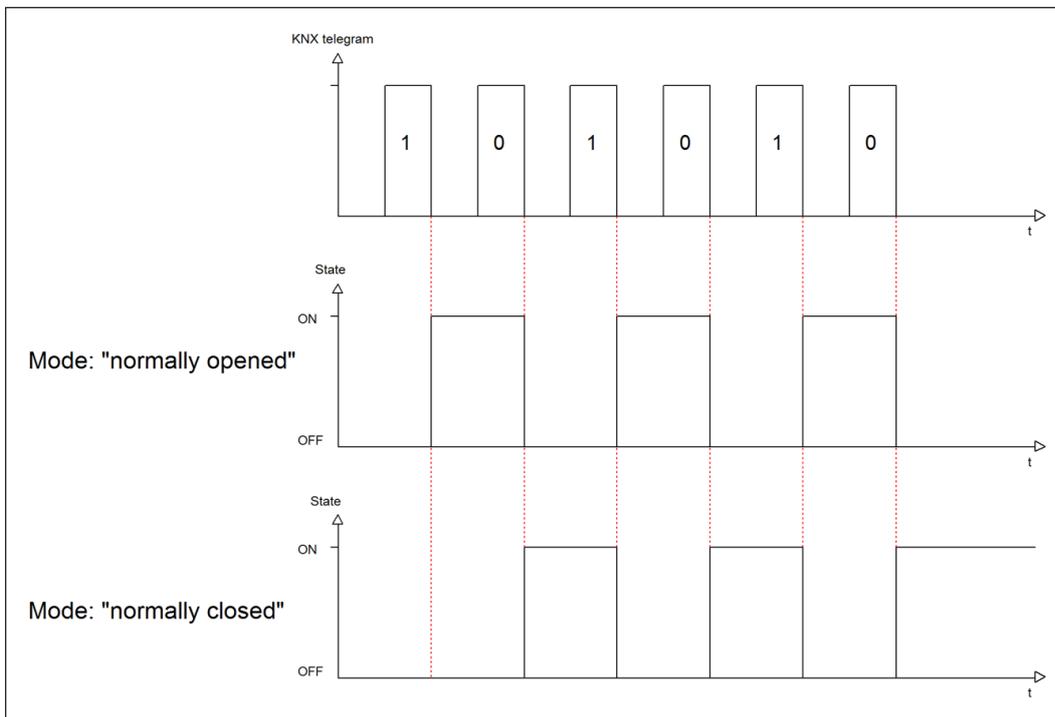


Figure 6: Diagram – Relay operation mode

4.4.2 Switch-on / -off delay

The table shows the possible settings:

ETS Text	Dynamic Range [Default value]	Comment
Switch-on/-off delay	0 ... 30000 s [0 s]	Setting the time by which the switch-on/ switch-off is to be delayed.

Table 11: Setting – Switch-on/-off delay

The **switch-on delay** causes a delayed switch-on of the switch output. This means that the output only switches at a certain time after the switch-on command has been given.

The **switch-off delay** works according to the same principle as the switch-on delay. It causes a time-delayed switch-off. On-delay and off-delay can be combined.

The following diagram shows the combination of a switch-on and switch-off delay:

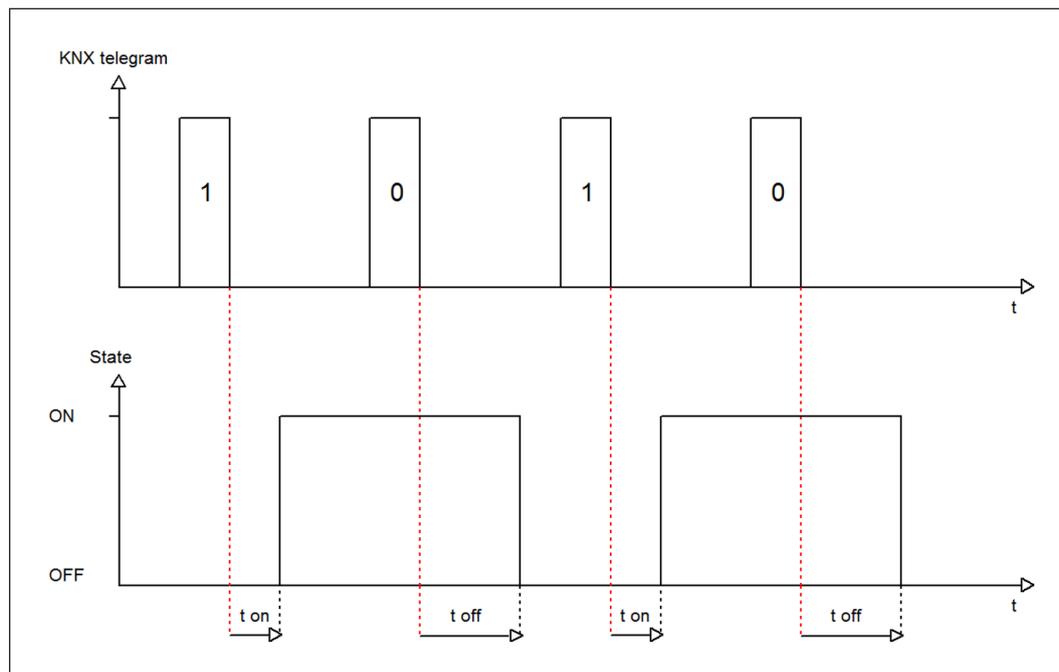


Figure 7: Diagram – Switch-on/-off delay

Important:

- The delays are only effective with a switching command via the communication object (via the object “Switch” of the channel as well as via the central function “Switch”).
- Manual operation via buttons on the device always reacts immediately (without delay).
- If a new command is sent during the expiry time for a delay, the last switching command applies.

Example:

Switch-on delay = 5 s

ON command is sent

An OFF command is sent after e.g. 3 seconds => OFF command is valid, ON command is no longer valid. Switch channel remains OFF.

4.4.3 Central function

The table shows the possible settings:

ETS Text	Dynamic Range [Default value]	Comment
Central function	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the channel should react to the central switch function or not.

Table 12: Setting – Central function

The central switch function can be selected for each individual channel. To do this, the “Central function” parameter must be set to “active”. This function enables easier programming of central switch functions. If the communication object of the central function is now addressed, all channels with activated “Central function” are switched.

The following table shows the communication object:

Number	Name / Object function	Length	Usage
*	Central function – Switch	1 Bit	Central switching of the channels

Table 13: Communication object – Central function

* Objects for central functions are always at the end of the object list. Object numbers are thus dependent on the number of channels of each device.

4.4.4 Status functions

The table shows the possible settings:

ETS Text	Dynamic Range [Default value]	Comment
Send status	<ul style="list-style-type: none"> ■ not active, passive status object ■ on change ■ on change and lock ■ on input of telegram 	Sending condition of the status object.
Send status cyclically (0 = not active)	0 ... 30000 s [0 s]	Setting of a time in which the status object is to be sent cyclically.
Additional inverted status	<ul style="list-style-type: none"> ■ not active ■ active 	Activation of an object for inverted status.

Table 14: Settings – Status functions

With the parameter “Send status” the sending condition can be defined:

- **not active, passive status object**
The status object is not actively sent but can be requested
- **on change**
The status object is sent each time the output is changed.
- **on change and lock**
The status object is sent whenever the output is changed - also during locking. Sending the status during locking ensures that a switch button sends the correct value after locking.
- **on input of telegram**
The status object is sent out with every telegram input - regardless of the output change.

The setting “Send status cyclically” can be used to set whether and at what interval the current status is to be sent to the bus. With the setting “0 s”, the function is inactive.

With the parameter “Additional inverted status”, a new object can also be activated with which the current status is sent inverted. This is used, for example, for integration in logic functions or other subsequent functions.

The following table shows the communication objects:

Number	Name / Object function	Length	Usage
7	Channel A – Status	1 Bit	Sends the status of the channel
8	Channel A – Inverted status	1 Bit	Sends the inverted status of the channel

Table 15: Communication objects – Status functions

4.4.5 Behaviour on locking / unlocking

The table shows the possible settings:

ETS Text	Dynamic Range [Default value]	Comment
Behaviour on locking	<ul style="list-style-type: none"> ■ OFF ■ ON ■ no change 	Setting for how the channel should behave when a lock is set.
Behaviour on unlocking	<ul style="list-style-type: none"> ■ OFF ■ ON ■ no change ■ previous state, catch up on switching ■ previous state 	Setting for how the channel should behave when it is unlocked.

Table 16: Setting – Behaviour on locking / unlocking

If a channel is locked by sending a “1” to the lock object, the channel is locked for further operation until it is unlocked again by sending a “0” to the lock object.

The following actions can be executed when **locking** and **unlocking**:

- **OFF**
The channel is switched off.
- **ON**
The channel is switched on.
- **no change**
The channel retains the current state.

In addition, the following actions can be executed when **unlocking**:

- **previous state, catch up on switching**
The channel restores the status it had before the lock and catches up on possible switching commands received during the lock. The last command is assumed.
- **previous state**
The channel is restored to the state it was in before it was locked.

The following table shows the communication object:

Number	Name / Object function	Length	Usage
4	Channel A – Lock	1 Bit	Activates / deactivates a lock

Table 17: Communication object – Lock object

4.4.6 Priority / Forced guidance

The table shows the possible settings:

ETS Text	Dynamic Range [Default value]	Comment
Priority / Forced guidance	<ul style="list-style-type: none"> ■ not active ■ 2 Bit forced guidance ■ 1 Bit priority ON ■ 1 Bit priority OFF 	Activate a priority or a forced guidance.
Fallback time for priority / forced guidance (0 = not active)	0 ... 600 min [0 min]	Definition of a fallback time from priority / forced guidance back to the normal state.
Behaviour after deactivation of priority / Behaviour after forced guidance	<ul style="list-style-type: none"> ■ OFF ■ ON ■ no change ■ previous state, catch up on switching ■ previous state 	Setting of the behaviour after deactivation of the priority / forced guidance.

Table 18: Settings – Priority / Forced guidance

Priority/forced guidance causes prioritised switching of the output. Priority is switched via a 1 Bit object, forced guidance via a 2 Bit object. With the activation of a priority/forced guidance, the actuator channel is “forced” into a fixed position (ON or OFF), which has the highest priority. This means that the channel cannot be operated manually or via an object. This is only possible when the priority/forced guidance is withdrawn or when a set fallback time has expired.

The channel is switched on with the setting “**1 Bit Priority ON**” when activated with a “1” and switched off accordingly with the setting “**1 Bit Priority OFF**”.

With a “0”, the priority is deactivated and the channel is in normal operation.

The object “**Forced guidance**” knows 3 possible states:

- **control = 1, value = 1** **Forced guidance ON** Channel is switched on
- **control = 1, value = 0** **Forced guidance OFF** Channel is switched off
- **control = 0, value = 0** **Forced guidance inactive** Channel is in normal operation

With the **fallback time**, the priority / forced guidance can be automatically deactivated after a certain time and the channel changes back to “normal” operation after the fallback time has elapsed.

The following actions can be performed after deactivating priority / forced guidance:

- **OFF**
The channel is switched off.
- **ON**
The channel is switched on.
- **no change**
The channel retains in current state.
- **previous state, catch up on switching**
The channel is restored to the state it was in before the “forced state”, retaining the last switching command that was sent during the “forced state”.
- **previous state**
The channel is restored to the state it was before it was “forced”.

The following table shows the communication objects:

Number	Name / Object function	Length	Usage
5	Channel A – Priority	1 Bit	Activate / deactivate the priority
5	Channel A – Forced guidance	2 Bit	Activate / deactivate the forced guidance

Table 19: Communication objects – Priority / Forced guidance

4.4.7 Behaviour on bus power return / bus power failure

The table shows the possible settings:

ETS Text	Dynamic Range [Default value]	Comment
Behaviour on bus power return	<ul style="list-style-type: none"> ■ OFF ■ ON ■ no change 	Behaviour on the return of the bus power.
Behaviour on bus power failure	<ul style="list-style-type: none"> ■ OFF ■ ON ■ no change 	Behaviour in response to a bus power failure.

Table 20: Settings – Behaviour on bus power return / bus power failure

The behaviour on bus power return / failure can be used to set which state the channel assumes on the respective event.

4.4.8 Logic

The submenu “Logic” is displayed with activation of the parameter in the corresponding channel. The table shows the possible settings:

ETS Text	Dynamic Range [Default value]	Comment
Logic function	<ul style="list-style-type: none"> ■ with Switch object and one Logic object ■ with Switch object and two Logic objects 	Setting how many logic objects are used as inputs in addition to the switch object.
Logic operation	<ul style="list-style-type: none"> ■ OR ■ AND ■ XOR ■ gate open with Logic object = 0 ■ gate open with Logic object = 1 	Setting according to which logical operation the logic should work.
Invert inputs	<ul style="list-style-type: none"> ■ not active ■ object “Switch” ■ object “Logic 1” ■ object “Logic 2” ■ object “Switch” and object “Logic 1” ■ object “Switch” and object “Logic 2” ■ object “Logic 1” and object “Logic 2” ■ object “Switch”, object “Logic 1” and object “Logic 2” 	Setting whether and which inputs work inverted. All settings with “Logic object 2” only available with “Logic function: with Switch object and two Logic objects”.
Invert output	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the output object should be inverted.
Set objects to value after bus power return	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether objects should be set to fixed values after bus power return.
Value for object “Switch”	<ul style="list-style-type: none"> ■ not active ■ value = 0 ■ value = 1 	Only shown if “Set objects to value after bus voltage return” is active. Setting with which value the objects are to be assigned after bus power return.
Value for object “Logic 1”	<ul style="list-style-type: none"> ■ not active ■ value = 0 ■ value = 1 	
Value for object “Logic 2”	<ul style="list-style-type: none"> ■ not active ■ value = 0 ■ value = 1 	

Table 21: Settings – Logic

The switch object is always an input of a logic function. It can also be determined whether one or two external logic objects are added for the function in order to carry out the logic operation. The result of the function is internally linked to the switch output (relay ON or OFF), therefore no output object is available. A logic with only external input objects is not possible here.

The logic functions switch the output ON when the following conditions are fulfilled:

- **AND**
When all inputs are active “1”.
- **OR**
If at least one input is active “1”.
- **XOR**
If only one input is active “1”.
- **gate open with Logic object = “0”**
The output can only be switched via the object “switch” if the logic objects have the value “0”.
- **gate open with Logic object = “1”**
The output can only be switched via the object “switch” if the logic objects have the value “1”.

The polarity of the inputs and the output can be individually reversed via the parameters “**Invert inputs / output**”.

The parameter “**Set objects to value after bus voltage return**” enables the logic to be set to a fixed value after bus power return.

The following table shows the communication objects:

Number	Name / Object function	Length	Usage
9	Channel A – Logic 1	1 Bit	Logic object 1, used for integration into a logic function
10	Channel A – Logic 2	1 Bit	Logic object 2, used for integration into a logic function

Table 22: Communication objects – Logic

4.4.9 Scenes

The submenu “Scenes” is displayed with activation of the parameter in the corresponding channel. With a scene, it is possible to carry out several actions in different trades (e.g. light, heating, roller shutter) simultaneously with a button press or an operating command. All this happens with one telegram. With the help of the scene function of the switch actuator, the channels can be integrated into a scene control. To do this, a scene number (1 ... 64) and a behaviour must be assigned to the corresponding memory location (scene A...H).

The table shows the possible settings:

ETS Text	Dynamic Range [Default value]	Comment
Learn scene	<ul style="list-style-type: none"> ■ not active ■ active ■ keep learned scene (do not maintain parameter settings) 	Learning scenes. Activate / deactivate memory function.
Scene A - H	<ul style="list-style-type: none"> ■ not active ■ active 	Activation of the corresponding scene.
Scene number	not active 1 – 64	Setting of the scene number to which the channel should react.
Scene behaviour	<ul style="list-style-type: none"> ■ OFF ■ ON ■ lock ■ unlock 	Reaction of the selected channel to the call of this scene.

Table 23: Settings – Scenes

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

The parameter “**keep learned scenes**” has the effect that learned scenes are retained even after reprogramming.

The following table shows the communication objects:

Number	Name / Object function	Length	Usage
6	Channel A – Scene	1 Byte	Call of the respective scene

Table 24: Communication object – Scene

Note: A KNX scene is transmitted by a 1-byte group address. When called up, scene 1 corresponds to the transmitted decimal value “0” or the hex value “00”. While the decimal value “128” or the hex value “80” is transmitted to save scene 1. The following table clarifies the relationship between scene number and transmitted value and helps with diagnosis via the group monitor of the ETS.

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

Table 25: Call up and save scenes

4.4.10 Threshold switch

The submenu “Threshold switch” is displayed with activation of the parameter in the corresponding channel. The following table shows the selection options:

ETS Text	Dynamic Range [Default value]	Comment
Datapoint type	<ul style="list-style-type: none"> ■ 1 Byte DPT 5.001 Percent (0...100 %) ■ 1 Byte DPT 5.005 Decimal factor (0...255) ■ 2 Byte DPT 7.001 Pulse (0...65535) ■ 2 Byte DPT 9.001 Temperature (°C) ■ 2 Byte DPT 9.004 Brightness (Lux) 	Setting of the datapoint type with which the threshold switch is to work.
Behaviour when undercut	<ul style="list-style-type: none"> ■ not active ■ OFF ■ ON 	Setting which state the channel is to assume when the value falls below the threshold.
Lower threshold	Free value input	Setting of the value below which the channel is to switch. Value and value range depending on the set datapoint type.
Behaviour when exceeded	<ul style="list-style-type: none"> ■ not active ■ OFF ■ ON 	Setting which state the channel is to assume when the value is exceeded.
Upper threshold	Free value input	Setting of the value above which the channel is to switch. Value and value range depending on the set datapoint type.

Table 26: Settings – Threshold switch

The threshold switch enables the switching of the channel depending on an analogue value. For example, a channel can be switched on when a certain temperature is fallen below (lower threshold) in order to activate a radiator. If the temperature exceeds a certain value (upper threshold), the channel can be switched off again.

Important: The channel switches when the upper threshold value is exceeded and when the lower threshold value is undercut. Values in between act like a hysteresis, i.e. no change at the output.

Example:

Parameter

Upper threshold = 20 °C
 Behaviour when exceeded = OFF
 Lower threshold = 15 °C
 Behaviour when undercut = ON

Current status: Channel is switched on

Reaction

Actual value 17°C = No reaction (remains ON)
 Actual value 20°C = Channel switches OFF
 Actual value 17°C = No reaction (remains OFF)
 Actual value 14°C = Channel switches ON

The following table shows the communication object:

Number	Name / Object function	Length	Usage
11	Channel A – Threshold switch	1 Byte 2 Byte	Receive the input value. DPT depending on the parameter setting

Table 27: Communication object – Threshold switch

4.4.11 Operating hours meter

The submenu “Operating hours meter” is displayed with activation of the parameter in the corresponding channel. The following table shows the selection options:

ETS Text	Dynamic Range [Default value]	Comment
Type of meter	<ul style="list-style-type: none"> ■ operating hours meter ■ service count down timer 	Setting how the meter is to be used
Datapoint type	<ul style="list-style-type: none"> ■ 4 Byte value in s (DPT 13.100) ■ 2 Byte value in h (DPT 7.007) 	Selection of the datapoint type for the output object.
Type “operating hours meter”		
Send operating hours every ... (0 = not active)	0 ... 10000 h [0 h]	Setting at which intervals the operating hours are to be sent.
Send operating hours cyclically every ...	not active 10 min – 4 h	Setting at which intervals the operating hours are to be sent cyclically.
Type “service count down timer”		
Send “Time until next service” every ... (0 = not active)	0 ... 10000 h [0 h]	Setting at which intervals the “Time until next service” should be sent.
Send service message at intervals of ...	0 ... 60000 h [0 h]	Setting of the value from which to count down.

Table 28: Settings – Operating hours meter

There are 2 operating modes for the meter to choose from:

Operating hours meter:

The operating hours meter counts the operating hours when the relay of the channel is closed.

Send operating hours every ...

Set a sending interval in full hours at which the operating hours are to be sent. The value is only sent when a certain meter reading has been reached.

Send operating hours cyclically every ...

Setting a cyclical transmission interval of the operating hours. The transmission cycle is fixed, regardless of whether the counter reading has changed in the meantime.

The following communication objects are available for this operating mode:

Number	Name / Object function	Length	Usage
2	Channel A – Meter reading - Operating hours	2 Byte 4 Byte	Sending the operating hours. DPT depending on parameter setting
3	Channel A – Reset operating hours	1 Bit	Resetting the operating hours meter

Table 29: Communication objects – Operating hours meter

Service count down timer

The “**Service count down timer**” counts down from the set start value when the relay of the channel is closed. When the set time expires, a service message is sent via the corresponding object.

Send “Time until next service” every ...

Set a sending interval in full hours at which the remaining hours until service are sent.

Send service message at intervals of ...

Set the value from which to count down. When the counter value “0 h” is reached, a service message is output via an object. This value is also valid if the service message was reset via object.

The following communication objects are available for this operating mode:

Number	Name / Object function	Length	Usage
1	Channel A – Service required	1 Bit	Reporting an upcoming service
2	Channel A – Time until next service	2 Byte 4 Byte	Sending the remaining service hours. DPT depending on parameter setting
3	Channel A – Reset: Service message	1 Bit	Resetting the service hours to the parameter value (Send service message at intervals of ...)

Table 30: Communication objects – Service count down timer

4.4.12 Current measurement

The submenu “Current measurement” is displayed with activation of the parameter of the same name in the corresponding channel.

Note: All functions of the current and consumption measurements are available approx. 30 seconds after a functional restart of the actuator (after programming or switching on the bus voltage). This also refers to “Consumption meter in channel writable via objects” and “Reset” of the meter readings.

The following table shows the selection options:

ETS Text	Dynamic Range [Default value]	Comment
Meter: Consumption (theoretical value)	<ul style="list-style-type: none"> ■ not active ■ active 	Activation of the current meter.
Object selection	<ul style="list-style-type: none"> ■ 4 Byte value in Wh (DPT 13.010) ■ 4 Byte value in kWh (DPT 13.013) 	Selection of the datapoint type for the output object of the meter.
Send meter reading cyclically every ...	<p style="text-align: center;">not active 1 min – 24 h</p>	Setting at which intervals the meter reading is to be sent.
Factor for conversion to theoretical power (W/kW): Current value x Factor	<p style="text-align: center;">100 ... 250 [230]</p>	Input option of a factor from voltage and cos φ. Unit “W” or “kW” depending on the set DPT.
Object selection	<ul style="list-style-type: none"> ■ 2 Byte value in mA (DPT 7.012) ■ 2 Byte floating value in mA (DPT 9.021) ■ 4 Byte floating value in A (DPT 14.019) ■ 2 Byte floating value in kW (DPT 9.024) ■ 4 Byte floating value in W (DPT 14.056) 	Selection of the datapoint type for the output object of the current measurement.
Add channel to total current	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the channel is taken into account in the total current measurement and in the total current meter.
Send value on change of ...	<p style="text-align: center;">not active 5 % – 75 %</p>	Setting from which change the value is to be sent.
Send cyclically every ...	<p style="text-align: center;">not active 1 min – 24 h</p>	Setting at which intervals the current value is to be sent.
Monitoring of current exceedance 1	<ul style="list-style-type: none"> ■ not active ■ active, Output: Switch ■ active, Output: Scene 	Selection of the output object for the current exceedance 1.

ETS Text	Dynamic Range [Default value]	Comment
Monitoring of current exceedance 2	<ul style="list-style-type: none"> ■ not active ■ active, Output: Switch ■ active, Output: Scene 	Selection of the output object for the current exceedance 2.
Monitoring of current undercut	<ul style="list-style-type: none"> ■ not active ■ active, Output: Switch ■ active, Output: Scene 	Selection of the output object for the current undercut.
Error message	<ul style="list-style-type: none"> ■ not active ■ Load failure with closed contact ■ Residual current with open contact ■ Residual current / Load failure 	Function selection of the 1 Bit error object.
Threshold	20 mA – 2 A [20 mA]	Setting of the threshold above which an error message is to be sent.

Table 31: Settings – Current measurement

With the activation of “**Meter: Consumption (theoretical value)**” further parameters appear. On the one hand, the datapoint type for the meter can be set (“Wh” or “kWh”). On the other hand, it can be set whether the meter reading is to be **sent cyclically**.

Important: The consumption is calculated from the measured current and the factor for conversion into theoretical power!

A new start value can be assigned to the meter reading via object. To do this, the parameter “**Consumption meter in channel writable via object**” must be active in the “**General settings**”.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
12	Channel A – Current value / Power value	2 Byte 4 Byte	Output of the actual measured value. DPT depending on the parameter setting.
17	Channel A – Reset: Meter	1 Bit	Object to set the counter to “0”.
18	Channel A – Meter: Power (Wh/kWh)	4 Byte	Object for output or for presetting the meter reading. DPT depending on the parameter setting.

Table 32: Communication object – Current measurement

4.4.12.1 Monitoring of current exceedance

Two independent switching thresholds for monitoring a current exceedance can be configured for each channel.

The table below shows the settings when the parameter “Monitoring of current exceedance 1 / 2” is activated:

ETS Text	Dynamic Range [Default value]	Comment
Value range	<ul style="list-style-type: none"> ■ 10 mA – 1000 mA ■ 1 A – 20 A 	Preselection and limitation of the value range of the exceedance.
Value for exceedance	10 ... 1000 mA [10] 1 ... 20 A [1]	Setting of the threshold for exceeding. Unit depends on the set value range.
Delay	hh:mm:ss [00:00:00]	Setting of a time by which the exceedance is to be sent with a delay.
Condition during delay	<ul style="list-style-type: none"> ■ Value must remain above “Value for exceedance” after exceeding ■ Value must remain above “Value for withdrawal” after exceeding 	Setting for how current fluctuations are handled during the delay time. Only shown if a delay time has been entered.
Send value if exceeded	<ul style="list-style-type: none"> ■ not active ■ value „1“ ■ value „0“ 	Setting the value to be sent when the switching threshold is exceeded. Only with „Output: Switch“.
Send scene if exceeded	not active 1 – 64 [1]	Setting of the scene to be sent when the switching threshold is exceeded. Only with „Output: Scene“.
Send output cyclically every ...	not active 1 min – 24 h	Setting at which intervals the value or scene is to be sent.
Switch off channel	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the channel should switch off when the threshold is exceeded.
Value range for withdrawal	<ul style="list-style-type: none"> ■ 10 mA – 1000 mA ■ 1 A – 20 A 	Preselection and limitation of the value range for withdrawal of exceedance
Value for withdrawal	10 ... 1000 mA [10] 1 ... 20 A [1]	Setting the threshold for the withdrawal of the overrun. Unit depends on the set value range.
Delay	hh:mm:ss [00:00:00]	Setting of a time by which the withdrawal of the exceedance is to be sent with a delay.

ETS Text	Dynamic Range [Default value]	Comment
Send value on withdrawal	<ul style="list-style-type: none"> ■ not active ■ value „1“ ■ value „0“ 	Setting the value to be sent when falling below the withdrawal threshold. Only with „Output: Switch“.
Send scene on withdrawal	not active 1 – 64 [2]	Setting the scene to be sent when falling below the withdrawal threshold. Only with „Output: Scene“.

Table 33: Settings – Monitoring of current exceedance

The “**Value range**” parameter is used to adjust the setting range of the switching threshold to the expected total current value.

When the individual “**Value for exceedance**” is overshoot, the “**Current exceedance 1/2**” output object sends - depending on the setting - either the corresponding 1-bit value or the desired scene number.

Short-term current peaks can be filtered by means of an adjustable “**Delay**”. The output object is sent with a delay of the set time and, if necessary, the channel is switched off with a delay (if “Switch off channel” is activated).

Condition during delay

- **Value must remain above “Value for exceedance” after exceeding**
The current value must remain above the “value for exceedance” after exceeding it for the first time, up to the end of the set delay, so that the output switches.
- **Value must remain above “Value for withdrawal” after exceeding**
After exceeding the “Value for exceedance” for the first time, the current value must remain above the “Value for withdrawal” until the end of the set delay, but may fall below the “Value for exceedance” so that the output switches.

When the value falls below the “**Value for withdrawal**”, the output object “**Current exceedance 1 / 2**” sends - depending on the setting - either the corresponding 1 Bit value or the desired scene number. By means of a “**Delay**”, the sending of the withdrawal can be delayed.

Important: To trigger withdrawal, the current value must have exceeded the “**Value for exceedance**” at least once before and the value for exceedance must be greater than the value for withdrawal!

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
13	Channel A – Current exceedance 1	1 Bit 1 Byte	Output object for monitoring of current exceedance1 . DPT depending on the parameter setting
14	Channel A – Current exceedance 2	1 Bit 1 Byte	Output object for monitoring of current exceedance 2 . DPT depending on the parameter setting

Table 34: Communication objects – Monitoring of current exceedance

4.4.12.2 Monitoring of current undercut

The table below shows the settings when the parameter “Monitoring of current undercut” is activated:

ETS Text	Dynamic Range [Default value]	Comment
Value range	<ul style="list-style-type: none"> ■ 10 mA – 1000 mA ■ 1 A – 20 A 	Preselection and limitation of the value range of the undercutting.
Value for undercut	10 ... 1000 mA [10] 1 ... 20 A [1]	Setting of the threshold for undercutting. Unit depends on the set value range.
Delay	hh:mm:ss [00:00:00]	Setting of a time by which the undercutting is to be sent delayed.
Condition during delay	<ul style="list-style-type: none"> ■ Value must remain below “Value for undercut” after undercutting ■ Value must remain below “Value for withdrawal” after undercutting 	Setting for how current fluctuations are handled during the delay time. Only shown if a delay time has been entered.
Send value if undercut	<ul style="list-style-type: none"> ■ not active ■ value „1“ ■ value „0“ 	Setting the value to be sent when the switching threshold is undercut. Only with „Output: Switch“.
Send scene if undercut	not active 1 – 64 [1]	Setting of the scene to be sent when the switching threshold is undercut. Only with „Output: Scene“.
Send output cyclically every ...	not active 1 min – 24 h	Setting at which intervals the value or scene is to be sent.
Switch off channel	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the channel should switch off when the threshold is undercut.
Value range for withdrawal	<ul style="list-style-type: none"> ■ 10 mA – 1000 mA ■ 1 A – 20 A 	Preselection and limitation of the range of values for the withdrawal of the undercut.
Value for withdrawal	10 ... 1000 mA [10] 1 ... 20 A [1]	Setting the threshold for the withdrawal of the undercut. Unit depends on the set value range.
Delay	hh:mm:ss [00:00:00]	Setting of a time by which the withdrawal of the undercutting is to be sent delayed.

ETS Text	Dynamic Range [Default value]	Comment
Send value on withdrawal	<ul style="list-style-type: none"> ■ not active ■ value „1“ ■ value „0“ 	Setting of the value to be sent when the withdrawal threshold is exceeded. Only with „Output: Switch“.
Send scene on withdrawal	not active 1 – 64 [2]	Setting of the scene to be sent when the withdrawal threshold is exceeded. Only with „Output: Scene“.

Table 35: Settings – Monitoring of current undercut

The “**Value range**” parameter is used to adjust the setting range of the switching threshold to the expected total current value.

When the value falls below the individual “**Value for undercut**”, the output object “**Current undercut**” sends - depending on the setting - either the corresponding 1 Bit value or the desired scene number.

Short-term current undercuts can be filtered by means of an adjustable “**Delay**”. The output object is sent with a delay of the set time and, if necessary, the channel is switched off with a delay (if “Switch off channel” is activated).

Condition during delay

- **Value must remain below “Value for undercut” after undercutting**
After falling below the “Value for undercut” for the first time, the current value must remain below this value up to the end of the set delay so that the output switches.
- **Value must remain below “Value for withdrawal” after undercutting**
After falling below the “Value for undercut” for the first time, the current value must remain below the “Value for withdrawal” up to the end of the set delay, but may rise above the “Value for undercut” so that the output switches.

When the individual “**Value for withdrawal**” is exceeded, the “**Current undercut**” output object sends - depending on the setting - either the corresponding 1 Bit value or the desired scene number. By means of a “**Delay**”, the sending of the withdrawal can be delayed.

Important: To trigger the withdrawal, the current value must have fallen below the “**Value for undercut**” at least once before and the value for undercut must be smaller than the value for withdrawal!

The following table shows the associated communication object:

Number	Name / Object function	Length	Usage
15	Channel A – Current undercut	1 Bit 1 Byte	Output object for monitoring of current undercut. DPT depending on the parameter setting

Table 36: Communication objects – Monitoring of current undercut

4.4.12.3 Error message

ETS Text	Dynamic Range [Default value]	Comment
Error message	<ul style="list-style-type: none"> ■ not active ■ Load failure with closed contact ■ Residual current with open contact ■ Residual current / Load failure 	Selection of the error to be displayed
Threshold	20 mA – 2 A [20 mA]	Selection of the threshold that must be exceeded/undercut.

Table 37: Settings – Error message

Load failure with closed contact:

If the set threshold is fallen below when the contact is closed, the “Load failure” output object sends a “1”. Exceedance again resets the value to “0”.

Residual current with open contact:

If the actuator measures a current greater than the set threshold when the contact is open, the “Residual current” output object sends a “1”.

Residual current / Load failure:

The output object “Residual current / Load failure” sends a “1” in both error cases..

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
16	Channel A – Load failure	1 Bit	Output object for the error message in the event of a load failure.
16	Channel A – Residual current	1 Bit	Output object for the error message in the event of a residual current.
16	Channel A – Residual current / Load failure	1 Bit	Output object for the error message in case of residual current and load failure.

Table 38: Communication objects – Error message

4.5 Staircase light

Note: When selecting “Staircase light”, the functions “Logic”, “Threshold switch” and “Operating hours meter” are not available!

The following settings are available for “Staircase light”:

Description of channel/objects	<input type="text"/>
Additional text	<input type="text"/>
Mode	<input checked="" type="radio"/> normally open <input type="radio"/> normally closed
Additional switch object	<input type="radio"/> not active <input checked="" type="radio"/> active
Staircase light timer	<input type="text" value="120"/> s
Prewarning	<input type="text" value="prewarning object"/>
Prewarning time	<input type="text" value="10"/> s
Manual switch-off	<input type="radio"/> not active <input checked="" type="radio"/> active
Extend staircase light timer	<input type="text" value="restart time"/>
Factor for object "Staircase light with time"	<input type="text" value="1 s"/>
Central function	<input type="radio"/> not active <input checked="" type="radio"/> active
Send status	<input type="text" value="on change"/>
Send status cyclically (0 = not active)	<input type="text" value="0"/> s
Additional inverted status	<input type="radio"/> not active <input checked="" type="radio"/> active
Behaviour on locking	<input type="text" value="no change"/>
Behaviour on unlocking	<input checked="" type="radio"/> OFF <input type="radio"/> start staircase light timer
Priority / Forced guidance	<input type="text" value="not active"/>
Behaviour on bus power return	<input type="text" value="state before bus power failure"/>
Behaviour on bus power failure	<input type="text" value="no change"/>
Scenes	<input type="radio"/> not active <input checked="" type="radio"/> active
Current measurement	<input type="radio"/> not active <input checked="" type="radio"/> active

Figure 8: Settings – Staircase light

The staircase light function enables automatic switching off after a preset time. The staircase light time is freely adjustable. The individual settings are described in the following chapters.

Information on “**Description of channel/objects**” and “**Additional text**”, see [4.3 Identical settings: Description of channel/objects + Additional text](#)

4.5.1 Relay operating mode

The table shows the possible settings:

ETS Text	Dynamic Range [Default value]	Comment
Mode	<ul style="list-style-type: none"> ■ normally open ■ normally closed 	Relay operating mode of the respective channel.

Table 39: Settings – Relay operating mode

The operating **mode** determines whether a relay is operated as a “normally open” or “normally closed” contact. This means whether the relay is activated with a “1” or with a “0”.

Important note: The green channel indicator LED on the actuator reflects the status of the status object (“1” = LED On, “0” = LED Off). It does not reflect the state of the relay contact, whether open or closed (important when configured as a “normally closed”).

The following diagram shows the behaviour of a relay - in the operating mode as a “normally open” contact or as a “normally closed” contact - in response to a KNX telegram:

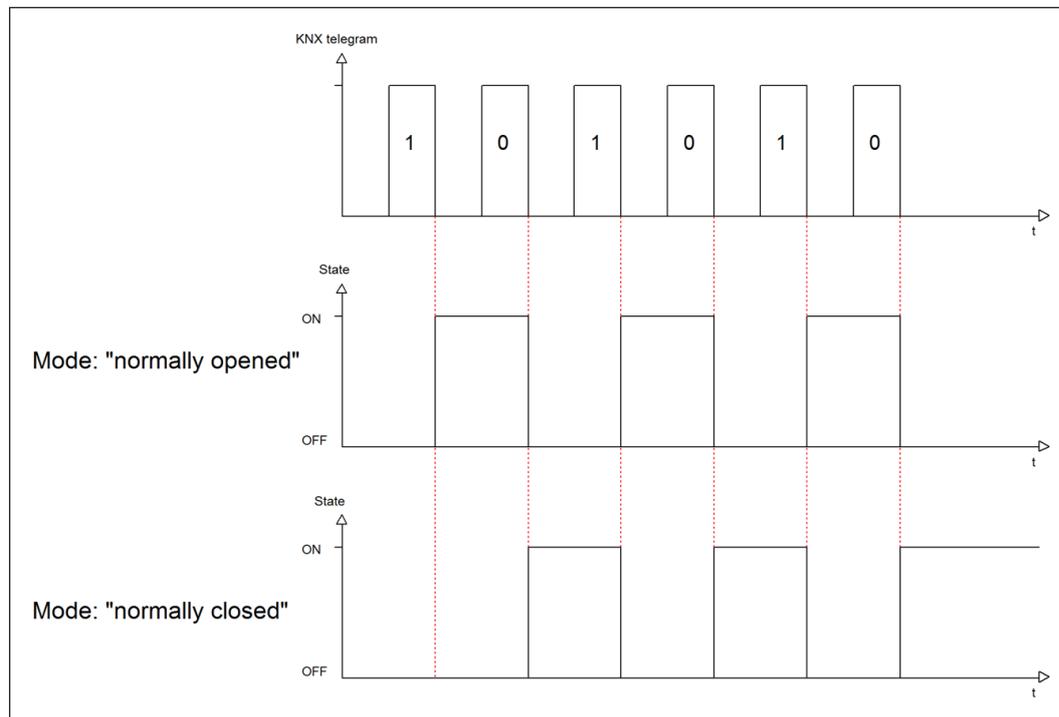


Figure 9: Diagram – Relay operation mode

4.5.2 Additional switch object

By activating the parameter “Additional switch object”, an object is displayed which can switch the corresponding channel independently of the staircase light function. Via this switch object, the channel can be switched ON/OFF permanently and does not access the staircase light time.

The following table shows the communication object:

Number	Name / Object function	Length	Usage
0	Channel A – Switch	1 Bit	Switch object for permanent ON/OFF

Table 40: Communication object – Additional switch object

4.5.3 Staircase light timer

The table shows the possible settings:

ETS Text	Dynamic Range [Default value]	Comment
Staircase light timer	1 ... 30000 s [120 s]	Setting the duration of the staircase light time.

Table 41: Setting – Staircase light timer

The following table shows the communication object:

Number	Name / Object function	Length	Usage
1	Channel A – Staircase light	1 Bit	Object triggers the staircase light timer

Table 42: Communication object – Staircase light timer

4.5.4 Prewarning

The table shows the possible settings:

ETS Text	Dynamic Range [Default value]	Comment
Prewarning	<ul style="list-style-type: none"> ■ not active ■ light On/Off ■ prewarning object ■ light On/Off and prewarning object 	Setting of the prewarning function.
Prewarning duration	0 ... 30000 s [1]	Setting the prewarning duration. Only available for functions with „light On/Off“.
Prewarning time	0 ... 30000 s [10]	Setting the prewarning time.

Table 43: Settings – Prewarning

The prewarning function warns about the end of the staircase light timer. The following options are available:

- **light On/Off**
After the staircase light timer has elapsed, the light is switched off for the set **prewarning duration** and then switched on again for the set **prewarning time**.
- **prewarning object**
An additional communication object is displayed for the prewarning. This object sends a “1” after the staircase light timer has elapsed - but the light remains switched on during this time. After the prewarning time has elapsed, the staircase light switches off and the prewarning object sends a “0”. With this setting, the total staircase light timer is extended by the set prewarning time.
- **light On/Off and prewarning object**
Combination of the above two settings.

The **prewarning duration** indicates the time that the channel is switched off after the staircase lighting timer has elapsed.

The **prewarning time** indicates the time the prewarning object sends a “1” or the light is switched on again after the prewarning duration.

Important: Total duration = staircase light timer + prewarning duration + prewarning time

The following diagram illustrates the time sequence:

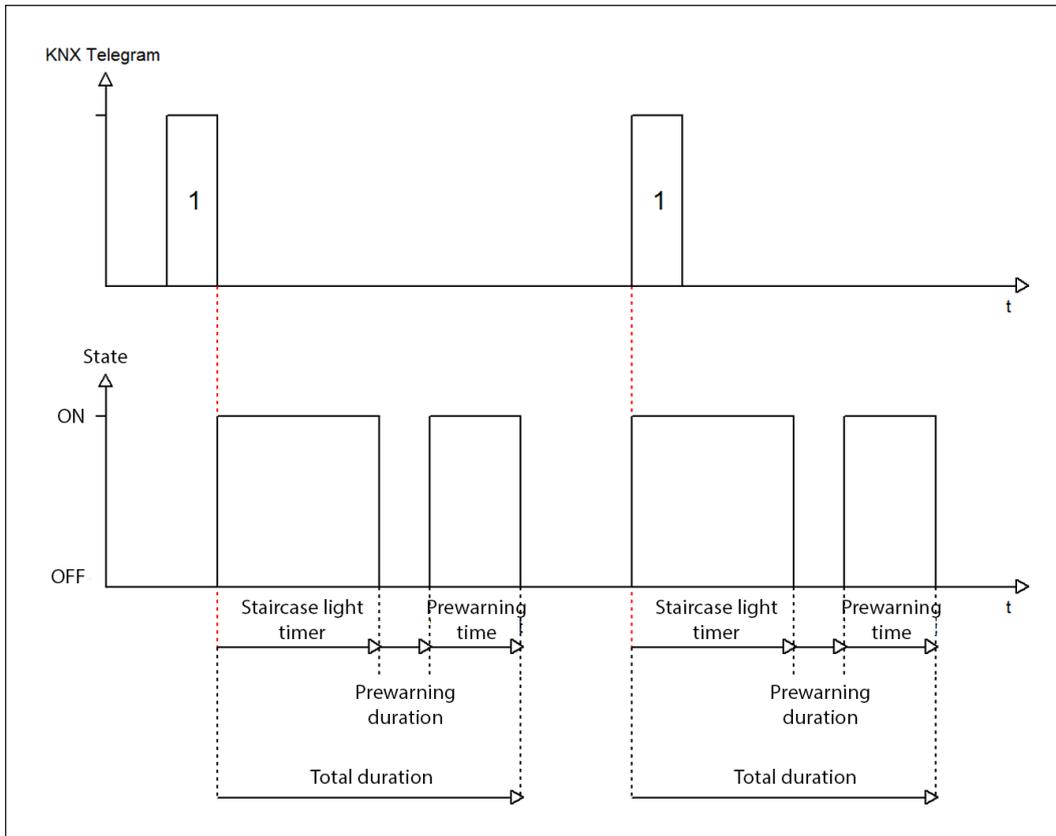


Figure 10: Diagram – Prewarning

The following table shows the communication object:

Number	Name / Object function	Length	Usage
3	Channel A – Prewarning	1 Bit	Sending the prewarning

Table 44: Communication object – Prewarning

4.5.5 Manual switch off

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

4.5.6 Extend staircase light time

The table shows the possible settings:

ETS Text	Dynamic Range [Default value]	Comment
Extend staircase light time	<ul style="list-style-type: none"> ■ not active ■ restart time ■ add time 	Setting whether and how the staircase light time can be extended.

Table 45: Settings – Extend staircase light time

The following options are available:

not active

Staircase light time cannot be extended and can only be restarted after the staircase light timer has expired.

restart time

The staircase light timer is restarted by sending a “1” to the “Staircase light” object again.

add time

The staircase light timer is added to the remaining staircase light time by sending a “1” to the object “Staircase light” again.

The following diagram shows the behaviour with the setting “Restart time”:

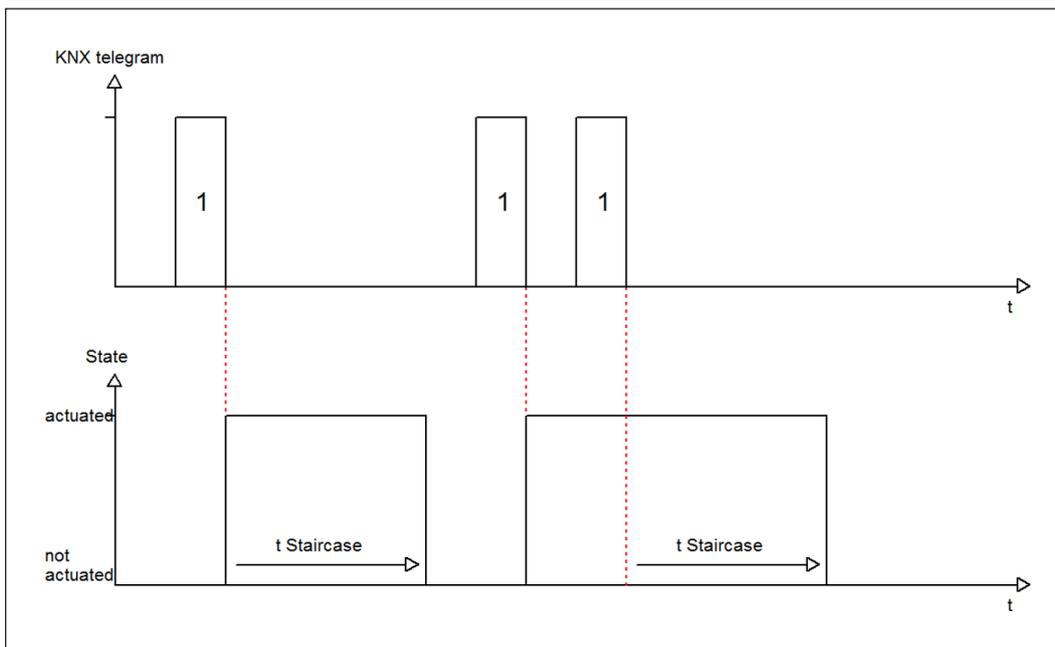


Figure 11: Diagram – Extend staircase light time

4.5.7 Staircase light with variable time

With this function, it is possible to individually set the staircase light timer via a separate communication object. The table shows the possible settings:

ETS Text	Dynamic Range [Default value]	Comment
Factor for object „staircase light with time“	<ul style="list-style-type: none"> ■ 1 s ■ 10 s ■ 1 min 	Setting the time factor

Table 46: Settings – Staircase light with variable time

The variable staircase light timer enables the staircase light to be started with variable time. For this purpose, a value of 0-255 is sent to the 1 Byte input. The resulting staircase light timer is calculated as follows:

Set time factor x sent value = staircase light timer

The staircase light function with variable time can be used in large staircases, for example, to start the staircase light on each floor with an individual time.

The following table shows the communication object:

Number	Name / Object function	Length	Usage
2	Channel A – Staircase light with time	1 Byte	Starting a variable staircase light timer

Table 47: Communication object – Staircase light with variable time

4.5.8 Central function

The table shows the possible settings:

ETS Text	Dynamic Range [Default value]	Comment
Central function	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the channel should react to the central switch function.

Table 48: Setting – Central function

This function simplifies the programming of central switch functions. If the communication object of the central function is triggered, all channels with activated central function are switched.

The following table shows the communication object:

Number	Name / Object function	Length	Usage
*	Central function – Switch	1 Byte	Central switching of the channels

Table 49: Communication object – Central function

* Objects for central functions are always at the end of the object list. Object numbers are thus dependent on the number of channels of each device.

4.5.9 Status functions

The table shows the possible settings:

ETS Text	Dynamic Range [Default value]	Comment
Send status	<ul style="list-style-type: none"> ■ not active, passive status object ■ on change ■ on change and lock ■ on input of telegram 	Sending condition of the status object.
Send status cyclically (0 = not active)	0 ... 30000 s [0 s]	Cyclical sending of the status
Additional inverted status	<ul style="list-style-type: none"> ■ not active ■ active 	Activation of an additional object for inverted status.

Table 50: Settings – Status functions

With the parameter “Send status” the sending condition can be defined:

- **not active, passive status object**
The status object is not actively sent but can be requested
- **on change**
The status object is sent each time the output is changed.
- **on change and lock**
The status object is sent whenever the output is changed - also during locking. Sending the status during locking ensures that a switch button sends the correct value after locking.
- **on input of telegram**
The status object is sent out with every telegram input - regardless of the output change.

The setting “Send status cyclically” can be used to set whether and at what interval the current status is to be sent to the bus. With the setting “0 s”, the function is inactive.

With the parameter “Additional inverted status”, a new object can also be activated with which the current status is sent inverted. This is used, for example, for integration in logic functions or other subsequent functions.

The following table shows the communication objects:

Number	Name / Object function	Length	Usage
7	Channel A – Status	1 Bit	Sends the status of the channel
8	Channel A – Inverted status	1 Bit	Sends the inverted status of the channel

Table 51: Communication objects – Status functions

4.5.10 Behaviour on locking / unlocking

The table shows the possible settings:

ETS Text	Dynamic Range [Default value]	Comment
Behaviour on locking	<ul style="list-style-type: none"> ■ OFF ■ ON ■ no change 	Setting for how the channel should behave when a lock is set.
Behaviour on unlocking	<ul style="list-style-type: none"> ■ OFF ■ start staircase light timer 	Setting for how the channel should behave when it is unlocked.

Table 52: Setting – Behaviour on locking / unlocking

If a channel is locked by sending a “1” to the lock object, the channel is locked for further operation until it is unlocked again by sending a “0” to the lock object.

The following actions can be executed when **locking** and **unlocking**:

- **OFF**
The channel is switched off.
- **ON**
The channel is switched on.
- **no change**
The channel retains the current state.
- **start staircase light timer (only for „unlocking“)**
The staircase light timer is started.

The following table shows the communication object:

Number	Name / Object function	Length	Usage
4	Channel A – Lock	1 Bit	Activates / deactivates a lock

Table 53: Communication object – Lock object

4.5.11 Priority / Forced guidance

The table shows the possible settings:

ETS Text	Dynamic Range [Default value]	Comment
Priority / Forced guidance	<ul style="list-style-type: none"> ■ not active ■ 2 Bit forced guidance ■ 1 Bit priority ON ■ 1 Bit priority OFF 	Activate a priority or a forced guidance.
Fallback time for priority / forced guidance (0 = not active)	0 ... 600 min [0 min]	Definition of a fallback time from priority / forced guidance back to the normal state. Parameter according to selection.
Behaviour after deactivation of priority / Behaviour after forced guidance	<ul style="list-style-type: none"> ■ OFF ■ start staircase light timer 	Setting of the behaviour after deactivation of the priority / Forced guidance.

Table 54: Settings – Priority / Forced guidance

Priority/forced guidance causes prioritised switching of the output. Priority is switched via a 1 Bit object, forced guidance via a 2 Bit object. With the activation of a priority/forced guidance, the actuator channel is “forced” into a fixed position (ON or OFF), which has the highest priority. This means that the channel cannot be operated manually or via an object. This is only possible when the priority/forced guidance is withdrawn or when a set fallback time has expired.

The channel is switched on with the setting “**1 Bit Priority ON**” when activated with a “1” and switched off accordingly with the setting “**1 Bit Priority OFF**”.

With a “0”, the priority is deactivated and the channel is in normal operation.

The object “**Forced guidance**” knows 3 possible states:

- | | | |
|---------------------------------|---------------------------------|--------------------------------|
| ■ control = 1, value = 1 | Forced guidance ON | Channel is switched on |
| ■ control = 1, value = 0 | Forced guidance OFF | Channel is switched off |
| ■ control = 0, value = 0 | Forced guidance inactive | Channel is in normal operation |

With the fallback time, the priority / forced guidance can be automatically deactivated after a certain time and the channel changes back to “normal” operation after the fallback time has elapsed.

The following actions can be performed after deactivating priority / forced guidance:

- **OFF**
The channel is switched off.
- **start staircase light timer**
The staircase light time is started.

The following table shows the communication objects:

Number	Name / Object function	Length	Usage
5	Channel A – Priority	1 Bit	Activate / deactivate the priority
5	Channel A – Forced guidance	2 Bit	Activate / deactivate the forced guidance

Table 55: Communication objects – Priority / Forced guidance

4.5.12 Behaviour on bus power return/failure

The table shows the possible settings:

ETS Text	Dynamic Range [Default value]	Comment
Behaviour on bus power return	<ul style="list-style-type: none"> ■ OFF ■ start staircase light timer ■ state before bus power failure 	Behaviour on the return of the bus power.
Behaviour on bus power failure	<ul style="list-style-type: none"> ■ OFF ■ ON ■ no change 	Behaviour in response to a bus power failure.

Table 56: Settings – Behaviour on bus power return/failure

The behaviour on bus voltage return/failure can be used to set which state the channel assumes on the respective event.

4.5.13 Scenes

The submenu “Scenes” is displayed with activation of the parameter in the corresponding channel. With a scene, it is possible to carry out several actions in different trades (e.g. light, heating, roller shutter) simultaneously with a button press or an operating command. All this happens with one telegram. With the help of the scene function of the switch actuator, the channels can be integrated into a scene control. To do this, a scene number (1 ... 64) and a behaviour must be assigned to the corresponding memory location (scene A...H).

The table shows the possible settings:

ETS Text	Dynamic Range [Default value]	Comment
Learn scene	<ul style="list-style-type: none"> ■ not active ■ active ■ keep learned scene (do not maintain parameter settings) 	Learning scenes. Activate / deactivate memory function.
Scene A - H	<ul style="list-style-type: none"> ■ not active ■ active 	Activation of the corresponding scene.
Scene number	not active 1 – 64	Setting of the scene number to which the channel should react.
Scene behaviour	<ul style="list-style-type: none"> ■ OFF ■ ON ■ lock ■ unlock 	Reaction of the selected channel to the call of this scene. “ON” = Start staircase light timer.

Table 57: Settings – Scenes

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

The parameter “**keep learned scenes**” has the effect that learned scenes are retained even after reprogramming.

The following table shows the communication object:

Number	Name / Object function	Length	Usage
6	Channel A – Scene	1 Byte	Call of the respective scene

Table 58: Communication object – Scene

Note:

A KNX scene is transmitted by a 1 Byte group address. When called up, scene 1 corresponds to the transmitted decimal value “0” or the hex value “00”. While the decimal value “128” or the hex value “80” is transmitted to save scene 1. The following table clarifies the relationship between scene number and transmitted value and helps with diagnosis via the group monitor of the ETS.

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

Table 59: Calling up and saving scenes

4.5.14 Current measurement

The submenu “Current measurement” is displayed with activation of the parameter of the same name in the corresponding channel.

Note: All functions of the current and consumption measurements are available approx. 30 seconds after a functional restart of the actuator (after programming or switching on the bus voltage). This also refers to “Consumption meter in channel writable via objects” and “Reset” of the meter readings.

The following table shows the selection options:

ETS Text	Dynamic Range [Default value]	Comment
Meter: Consumption (theoretical value)	<ul style="list-style-type: none"> ■ not active ■ active 	Activation of the current meter.
Object selection	<ul style="list-style-type: none"> ■ 4 Byte value in Wh (DPT 13.010) ■ 4 Byte value in kWh (DPT 13.013) 	Selection of the datapoint type for the output object of the meter.
Send meter reading cyclically every ...	<p style="text-align: center;">not active 1 min – 24 h</p>	Setting at which intervals the meter reading is to be sent.
Factor for conversion to theoretical power (W/kW): Current value x Factor	<p style="text-align: center;">100 ... 250 [230]</p>	Input option of a factor from voltage and cos φ. Unit “W” or “kW” depending on the set DPT.
Object selection	<ul style="list-style-type: none"> ■ 2 Byte value in mA (DPT 7.012) ■ 2 Byte floating value in mA (DPT 9.021) ■ 4 Byte floating value in A (DPT 14.019) ■ 2 Byte floating value in kW (DPT 9.024) ■ 4 Byte floating value in W (DPT 14.056) 	Selection of the datapoint type for the output object of the current measurement.
Add channel to total current	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the channel is taken into account in the total current measurement and in the total current meter.
Send value on change of ...	<p style="text-align: center;">not active 5 % – 75 %</p>	Setting from which change the value is to be sent.
Send cyclically every ...	<p style="text-align: center;">not active 1 min – 24 h</p>	Setting at which intervals the current value is to be sent.
Monitoring of current exceedance 1	<ul style="list-style-type: none"> ■ not active ■ active, Output: Switch ■ active, Output: Scene 	Selection of the output object for the current exceedance 1.

ETS Text	Dynamic Range [Default value]	Comment
Monitoring of current exceedance 2	<ul style="list-style-type: none"> ■ not active ■ active, Output: Switch ■ active, Output: Scene 	Selection of the output object for the current exceedance 2.
Monitoring of current undercut	<ul style="list-style-type: none"> ■ not active ■ active, Output: Switch ■ active, Output: Scene 	Selection of the output object for the current undercut.
Error message	<ul style="list-style-type: none"> ■ not active ■ Load failure with closed contact ■ Residual current with open contact ■ Residual current / Load failure 	Function selection of the 1 Bit error object.
Threshold	20 mA – 2 A [20 mA]	Setting of the threshold above which an error message is to be sent.

Table 60: Settings – Current measurement

With the activation of “**Meter: Consumption (theoretical value)**” further parameters appear. On the one hand, the datapoint type for the meter can be set (“Wh” or “kWh”). On the other hand, it can be set whether the meter reading is to be **sent cyclically**.

Important: The consumption is calculated from the measured current and the factor for conversion into theoretical power!

A new start value can be assigned to the meter reading via object. To do this, the parameter “**Consumption meter in channel writable via object**” must be active in the “**General settings**”.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
12	Channel A – Current value / Power value	2 Byte 4 Byte	Output of the actual measured value. DPT depending on the parameter setting.
17	Channel A – Reset: Meter	1 Bit	Object to set the counter to “0”.
18	Channel A – Meter: Power (Wh/kWh)	4 Byte	Object for output or for presetting the meter reading. DPT depending on the parameter setting.

Table 61: Communication object – Current measurement

4.5.14.1 Monitoring of current exceedance

Two independent switching thresholds for monitoring a current exceedance can be configured for each channel.

The table below shows the settings when the parameter “Monitoring of current exceedance 1 / 2” is activated:

ETS Text	Dynamic Range [Default value]	Comment
Value range	<ul style="list-style-type: none"> ■ 10 mA – 1000 mA ■ 1 A – 20 A 	Preselection and limitation of the value range of the exceedance.
Value for exceedance	10 ... 1000 mA [10] 1 ... 20 A [1]	Setting of the threshold for exceeding. Unit depends on the set value range.
Delay	hh:mm:ss [00:00:00]	Setting of a time by which the exceedance is to be sent with a delay.
Condition during delay	<ul style="list-style-type: none"> ■ Value must remain above “Value for exceedance” after exceeding ■ Value must remain above “Value for withdrawal” after exceeding 	Setting for how current fluctuations are handled during the delay time. Only shown if a delay time has been entered.
Send value if exceeded	<ul style="list-style-type: none"> ■ not active ■ value „1“ ■ value „0“ 	Setting the value to be sent when the switching threshold is exceeded. Only with „Output: Switch“.
Send scene if exceeded	not active 1 – 64 [1]	Setting of the scene to be sent when the switching threshold is exceeded. Only with „Output: Scene“.
Send output cyclically every ...	not active 1 min – 24 h	Setting at which intervals the value or scene is to be sent.
Switch off channel	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the channel should switch off when the threshold is exceeded.
Value range for withdrawal	<ul style="list-style-type: none"> ■ 10 mA – 1000 mA ■ 1 A – 20 A 	Preselection and limitation of the value range for withdrawal of exceedance
Value for withdrawal	10 ... 1000 mA [10] 1 ... 20 A [1]	Setting the threshold for the withdrawal of the overrun. Unit depends on the set value range.
Delay	hh:mm:ss [00:00:00]	Setting of a time by which the withdrawal of the exceedance is to be sent with a delay.

ETS Text	Dynamic Range [Default value]	Comment
Send value on withdrawal	<ul style="list-style-type: none"> ■ not active ■ value „1“ ■ value „0“ 	Setting the value to be sent when falling below the withdrawal threshold. Only with „Output: Switch“.
Send scene on withdrawal	not active 1 – 64 [2]	Setting the scene to be sent when falling below the withdrawal threshold. Only with „Output: Scene“.

Table 62: Settings – Monitoring of current exceedance

The “**Value range**” parameter is used to adjust the setting range of the switching threshold to the expected total current value.

When the individual “**Value for exceedance**” is overshoot, the “**Current exceedance 1/2**” output object sends - depending on the setting - either the corresponding 1-bit value or the desired scene number.

Short-term current peaks can be filtered by means of an adjustable “**Delay**”. The output object is sent with a delay of the set time and, if necessary, the channel is switched off with a delay (if “Switch off channel” is activated).

Condition during delay

- **Value must remain above “Value for exceedance” after exceeding**
The current value must remain above the “value for exceedance” after exceeding it for the first time, up to the end of the set delay, so that the output switches.
- **Value must remain above “Value for withdrawal” after exceeding**
After exceeding the “Value for exceedance” for the first time, the current value must remain above the “Value for withdrawal” until the end of the set delay, but may fall below the “Value for exceedance” so that the output switches.

When the value falls below the “**Value for withdrawal**”, the output object “**Current exceedance 1 / 2**” sends - depending on the setting - either the corresponding 1 Bit value or the desired scene number. By means of a “**Delay**”, the sending of the withdrawal can be delayed.

Important: To trigger withdrawal, the current value must have exceeded the “**Value for exceedance**” at least once before and the value for exceedance must be greater than the value for withdrawal!

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
13	Channel A – Current exceedance 1	1 Bit 1 Byte	Output object for monitoring of current exceedance1 . DPT depending on the parameter setting
14	Channel A – Current exceedance 2	1 Bit 1 Byte	Output object for monitoring of current exceedance 2 . DPT depending on the parameter setting

Table 63: Communication objects – Monitoring of current exceedance

4.5.14.2 Monitoring of current undercut

The table below shows the settings when the parameter “Monitoring of current undercut” is activated:

ETS Text	Dynamic Range [Default value]	Comment
Value range	<ul style="list-style-type: none"> ■ 10 mA – 1000 mA ■ 1 A – 20 A 	Preselection and limitation of the value range of the undercutting.
Value for undercut	10 ... 1000 mA [10] 1 ... 20 A [1]	Setting of the threshold for undercutting. Unit depends on the set value range.
Delay	hh:mm:ss [00:00:00]	Setting of a time by which the undercutting is to be sent delayed.
Condition during delay	<ul style="list-style-type: none"> ■ Value must remain below “Value for undercut” after undercutting ■ Value must remain below “Value for withdrawal” after undercutting 	Setting for how current fluctuations are handled during the delay time. Only shown if a delay time has been entered.
Send value if undercut	<ul style="list-style-type: none"> ■ not active ■ value „1“ ■ value „0“ 	Setting the value to be sent when the switching threshold is undercut. Only with „Output: Switch“.
Send scene if undercut	not active 1 – 64 [1]	Setting of the scene to be sent when the switching threshold is undercut. Only with „Output: Scene“.
Send output cyclically every ...	not active 1 min – 24 h	Setting at which intervals the value or scene is to be sent.
Switch off channel	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the channel should switch off when the threshold is undercut.
Value range for withdrawal	<ul style="list-style-type: none"> ■ 10 mA – 1000 mA ■ 1 A – 20 A 	Preselection and limitation of the range of values for the withdrawal of the undercut.
Value for withdrawal	10 ... 1000 mA [10] 1 ... 20 A [1]	Setting the threshold for the withdrawal of the undercut. Unit depends on the set value range.
Delay	hh:mm:ss [00:00:00]	Setting of a time by which the withdrawal of the undercutting is to be sent delayed.

ETS Text	Dynamic Range [Default value]	Comment
Send value on withdrawal	<ul style="list-style-type: none"> ■ not active ■ value „1“ ■ value „0“ 	Setting of the value to be sent when the withdrawal threshold is exceeded. Only with „Output: Switch“.
Send scene on withdrawal	not active 1 – 64 [2]	Setting of the scene to be sent when the withdrawal threshold is exceeded. Only with „Output: Scene“.

Table 64: Settings – Monitoring of current undercut

The “**Value range**” parameter is used to adjust the setting range of the switching threshold to the expected total current value.

When the value falls below the individual “**Value for undercut**”, the output object “**Current undercut**” sends - depending on the setting - either the corresponding 1 Bit value or the desired scene number.

Short-term current undercuts can be filtered by means of an adjustable “**Delay**”. The output object is sent with a delay of the set time and, if necessary, the channel is switched off with a delay (if “Switch off channel” is activated).

Condition during delay

- **Value must remain below “Value for undercut” after undercutting**
After falling below the “Value for undercut” for the first time, the current value must remain below this value up to the end of the set delay so that the output switches.
- **Value must remain below “Value for withdrawal” after undercutting**
After falling below the “Value for undercut” for the first time, the current value must remain below the “Value for withdrawal” up to the end of the set delay, but may rise above the “Value for undercut” so that the output switches.

When the individual “**Value for withdrawal**” is exceeded, the “**Current undercut**” output object sends - depending on the setting - either the corresponding 1 Bit value or the desired scene number. By means of a “**Delay**”, the sending of the withdrawal can be delayed.

Important: To trigger the withdrawal, the current value must have fallen below the “**Value for undercut**” at least once before and the value for undercut must be smaller than the value for withdrawal!

The following table shows the associated communication object:

Number	Name / Object function	Length	Usage
15	Channel A – Current undercut	1 Bit 1 Byte	Output object for monitoring of current undercut. DPT depending on the parameter setting

Table 65: Communication objects – Monitoring of current undercut

4.5.14.3 Error message

ETS Text	Dynamic Range [Default value]	Comment
Error message	<ul style="list-style-type: none"> ■ not active ■ Load failure with closed contact ■ Residual current with open contact ■ Residual current / Load failure 	Selection of the error to be displayed
Threshold	20 mA – 2 A [20 mA]	Selection of the threshold that must be exceeded/undercut.

Table 66: Settings – Error message

Load failure with closed contact:

If the set threshold is fallen below when the contact is closed, the “Load failure” output object sends a “1”. Exceedance again resets the value to “0”.

Residual current with open contact:

If the actuator measures a current greater than the set threshold when the contact is open, the “Residual current” output object sends a “1”.

Residual current / Load failure:

The output object “Residual current / Load failure” sends a “1” in both error cases..

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
16	Channel A – Load failure	1 Bit	Output object for the error message in the event of a load failure.
16	Channel A – Residual current	1 Bit	Output object for the error message in the event of a residual current.
16	Channel A – Residual current / Load failure	1 Bit	Output object for the error message in case of residual current and load failure.

Table 67: Communication objects – Error message

4.6 Switch pulse

Description of channel/objects	<input type="text"/>
Additional text	<input type="text"/>
Mode	<input checked="" type="radio"/> normally open <input type="radio"/> normally closed
Pulse time	500 ms <input type="text"/>
Repeat pulse once	<input checked="" type="radio"/> not active <input type="radio"/> active
Behaviour on locking	<input type="radio"/> OFF <input checked="" type="radio"/> no change
Behaviour on unlocking	<input checked="" type="radio"/> OFF <input type="radio"/> switch pulse

Figure 12: Settings – Channel function: Switch pulse

The individual settings are described in the following chapters.

Information on “**Description of channel/objects**” and “**Additional text**”, see [4.3 Identical settings: Description of channel/objects + Additional text](#)

4.6.1 Relay operating mode

The table shows the possible settings:

ETS Text	Dynamic Range [Default value]	Comment
Mode	<ul style="list-style-type: none"> ■ normally open ■ normally closed 	Relay operating mode of the respective channel.

Table 68: Settings – Relay operating mode

The operating **mode** determines whether a relay is operated as a “normally open” or “normally closed” contact. This means whether the relay is activated with a “1” or with a “0”.

Important note: The green channel indicator LED on the actuator reflects the status of the status object (“1” = LED On, “0” = LED Off). It does not reflect the state of the relay contact, whether open or closed (important when configured as a “normally closed”).

The following diagram shows the behaviour of a relay - in the operating mode as a “normally open” contact or as a “normally closed” contact - in response to a KNX telegram:

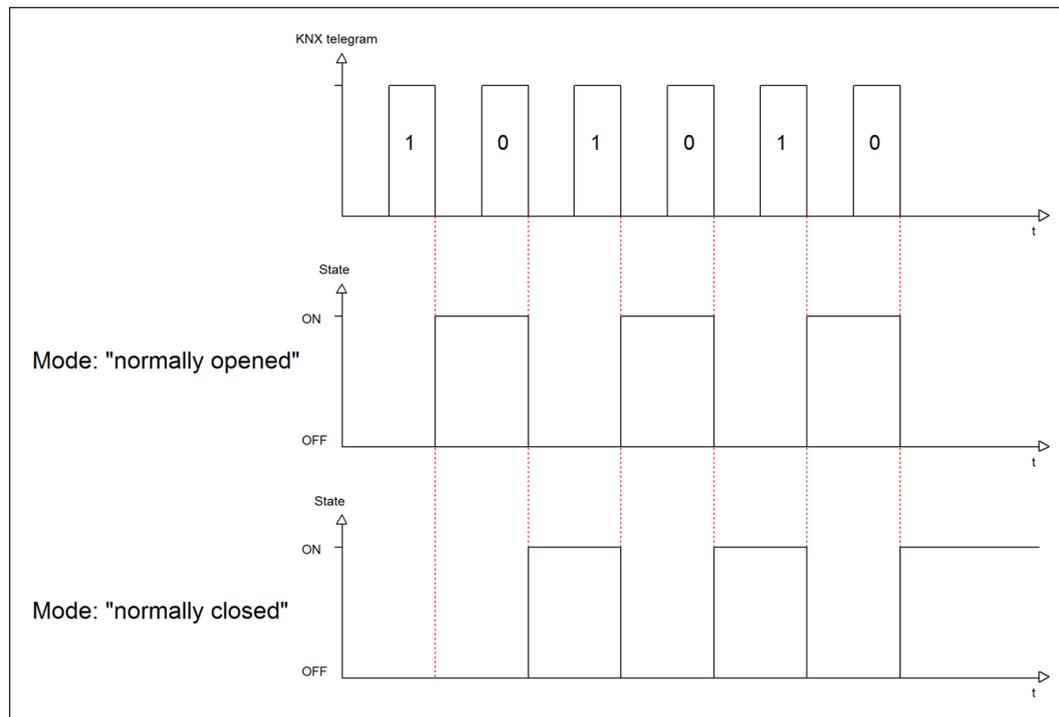


Figure 13: Diagram – Relay operation mode

4.6.2 Switch pulse

The table shows the possible settings:

ETS Text	Dynamic Range [Default value]	Comment
Pulse time	300 ms – 30 s [500 ms]	Setting the duration of the pulse.
Repeat pulse signal once	<ul style="list-style-type: none"> ■ not active ■ active 	Setting whether the pulse should be repeated once more.
Time until the next pulse	0,5 s – 30 s [0,5 s]	Setting the duration between the first and the second pulse. Only shown if “Repeat pulse signal once” is active.

Table 69: Settings – Switch pulse

Can be used e.g. for a bell. By sending a “1” to the object “Switch pulse”, the bell is activated for 0.5 s, for example. After a set delay, the bell is activated a second time for the same pulse time. Thus the bell rings twice.

The following table shows the communication object:

Number	Name / Object function	Length	Usage
1	Channel A – Switch pulse	1 Bit	Starting the pulse

Table 70: Communication object – Switch pulse

4.6.3 Behaviour on locking / unlocking

The table shows the possible settings:

ETS Text	Dynamic Range [Default value]	Comment
Behaviour on locking	<ul style="list-style-type: none"> ■ OFF ■ no change 	Setting for how the channel should behave when a lock is set.
Behaviour on unlocking	<ul style="list-style-type: none"> ■ OFF ■ switch pulse 	Setting for how the channel should behave when it is unlocked.

Table 71: Setting – Behaviour on locking / unlocking

If a channel is locked by sending a “1” to the lock object, the channel is locked for further operation until it is unlocked again by sending a “0” to the lock object.

The following actions can be executed when **locking** and **unlocking**:

- **OFF**
The channel is switched off.
- **no change**
The channel retains the current state.
- **switch pulse**
The channel triggers the switch pulse.

The following table shows the communication object:

Number	Name / Object function	Length	Usage
4	Channel A – Lock	1 Bit	Activates / deactivates a lock

Table 72: Communication object – Lock object

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6 Appendix

6.1 Statutory requirements

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

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

6.2 Disposal

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

6.3 Assembly



Danger to life from electric current!

All work on the unit may only be carried out by qualified electricians. The country-specific regulations and the applicable KNX guidelines must be observed.

The units are approved for operation in the EU and bear the CE mark.

Use in the USA and Canada is not permitted!

After the unit has been installed and the mains voltage has been switched on, voltage may be present at the outputs. The outputs can be switched off via the built-in channel switch.

When installed, a KNX bus telegram can switch the outputs to live at any time.

Before starting work on the unit, always disconnect it from the power supply via the upstream fuses. After installation, all live terminals and connections must be completely closed by the control panel cover to prevent accidental contact. It must not be possible to open the control panel cover without tools

6.4 History

V1.0 First version of the technical manual

DB V3.0 04/2023