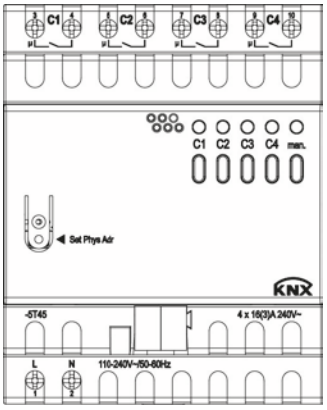
KNX Manual
Switch actuator
GSAB-4K KNX



GSAB-4K KNX	108402

Contents

1 Functional characteristics

- 4-way switch actuator
- LED switching status indicator for each channel.
- Manual operation on device (even without bus voltage).
- Adjustable features: e.g. switching, delayed switching, pulse function.
- Links, type of contact (opening contact/NO contact) and participation in central commands such as permanent On, permanent Off, central switching, and save/call up scene.
- Switch functions: e.g. On/Off, pulse, On/Off delay, staircase light with forewarning.
- Logical links: e.g. block, AND, release, OR.
- Activation of the channel function via 1-bit telegram or 8-bit threshold.

1.1 Operation

Each channel can be switched on and off independently of all parameters using the buttons on the device. A status LED displays the current switching status.

All bus telegrams are ignored with manual operation switched on (manual button) and the channels are exclusively to be operated via the buttons.

Mains voltage is required for the functioning of the buttons and LEDs, bus voltage or bus module are not required.

2 Technical data

KNX operating voltage	Bus voltage, ≤ 4 mA
Operating voltage	110 – 240 V AC
Frequency	50 – 60 Hz
Standby output	0.3 W
Type of installation	DIN-rail
Width	4 TE
Connection type	KNX bus terminal
Max. cable cross-section	Solid: 0.5 mm² (Ø 0.8) to 4 mm² | strand with crimp terminal: 0.5 mm² to 2.5 mm²
Number of channels	4
Contact gap	< 3 mm
Voltage output	240 V AC
Switch output	Floating
Switching different external phases	Possible
Type of contact	16 A, 3 A NO contact
Permissible starting current	max. 800 A / 200 µs
Switching cycles	40 000 at 140 µF
Resistive load	3680 W
Incandescent/halogen lamp load	2000 W
Fluorescent lamp load (KVG) parallel-corrected	1300 W (140 µF)
Fluorescent lamp load (KVG) not corrected	2000 VA
Fluorescent lamp load (EB)	1200 W
Energy-saving lamps	300 W
LED lamp	< 2 W = 55 W or > 2 W < 8 W = 180 W
Suitable for SELV	Yes, if all channels switch SELV
Ambient temperature	-5 °C–+45 °C
Protection rating	IP 20
Protection class	II in accordance with EN 60 730-1

3 The application programme "GSAB-4K KNX"

3.1 Selection in the product database

Manufacturer	GARO AB
Product family	Switch actuators
Product type	GSAB-4K KNX
Program name	GSAB-4K KNX

Table 1

Number of communication objects	44
Number of group addresses	254
Number of associations	255

3.2 Communication objects

The objects are divided into channel-related and common objects

3.2.1 Channel-related objects:

Table 2:

No.	Object name	Function	Type DPT	Flags			
				C	R	W	T
0	*Channel C1*	*Switching object*	1 bit 1.001	✓	✓	✓	
		Threshold as percent	1 byte 5.001	✓	✓	✓	
		Threshold 0..255	1 byte 5.010	✓	✓	✓	
		Threshold EIS 5 (DPT9.xxx)	2 byte 9.xxx	✓	✓	✓	
		Threshold 0..65535	2 byte 7.001	✓	✓	✓	
1	*Channel C1*	*Logic input in AND gate*	1 bit 1.001	✓	✓	✓	
		Logic input in OR gate	1 bit 1.001	✓	✓	✓	
		Logic input in XOR gate	1 bit 1.001	✓	✓	✓	
2	*Channel C1*	*Block*	1 bit 1.003	✓	✓	✓	
3	*Channel C1*	*Call up/save scenes*	1 byte 18.001	✓	✓	✓	✓
4	*Channel C1*	*Block scenes = 1* *Enable scenes = 1*	1 bit 1.003	✓	✓	✓	
5	*Channel C1*	*Feedback On/Off*	1 bit 1.001	✓	✓		✓
6	*Channel C1*	*Time to next service*	2 byte 7.001	✓	✓		✓
		Operating hours feedback	2 byte 7.001	✓	✓	✓	✓
7	*Channel C1*	*Service required*	1 bit 1.001	✓	✓		✓
				C	R	W	T

Continuation:

No.	Object name	Function	Type DPT	Flags			
				C	R	W	T
8	*Channel C1*	*Switching with priority*	2 bit 2.001	✓	✓	✓	
		Reset service	1 bit 1.001	✓	✓	✓	
		Reset operating hours	1 bit 1.001	✓	✓	✓	
9	*Not used*						

3.2.2 Common objects:

Table 3:

No.	Object name	Function	Type DPT	Flags			
				C	R	W	T
78	*C1 – C4*	*Manual*	1 bit 1.001	✓	✓	✓	✓
240	*Central permanent ON*	*GSAB-4K KNX*	1 bit 1.001	✓	✓	✓	✓
241	*Central permanent OFF*	*GSAB-4K KNX*	1 bit 1.001	✓	✓	✓	✓
242	*Central switching*	*GSAB-4K KNX*	1 bit 1.001	✓	✓	✓	✓
243	*Call up/save central scenes*	*GSAB-4K KNX*	1 byte 18.001	✓	✓	✓	✓
250	*Version of bus coupling unit*	*send*	14 byte 16.001	✓	✓		✓
251	*Version C1 – C4*	*send*	14 byte 16.001	✓	✓		✓
				C	R	W	T

3.2.3 Description of objects

- **Object 0** "*Switch object, threshold as percent, threshold 0..255, threshold EIS 5 (DPT 9.xxx), threshold 0..65535*"

This object activates the set channel function (see parameter: *Channel function*).

The set channel function can either be activated via 1-bit telegram or by exceeding a threshold (8- or 16-bit telegram).

Table 4:

Parameter		Activation of channel function via
Activation of function via	*Type of threshold object*	
Switching object		1-bit telegram
Exceeding the threshold	*Object type: Percent (DPT 5.001)*	Exceeding per cent value
	Object type: Counter value 0..255 (DPT 5.010)	Any value in given numerical range
	Object type: Counter value 0..65535 (DPT 7.001)	
	Object type: EIS5 e.g. CO2, brightness (DPT 9.xxx)	2 byte floating-point number

- **Object 1** "*Logic input in AND gate, in OR gate, in XOR gate*"

Only available if *Link* is activated (*Configuration options* parameter page).
Forms a logical link together with object 0 to activate the channel function.

- **Object 2** "*Block*"

Blocks the channel function.
Responses to setting and cancelling the block can be configured if the block function has been activated (*Configuration options* parameter page).

- **Object 3** "*Call up/save scene*"

Only available if the scene function has been activated (*Configuration options* parameter page).

This object can be used to save and subsequently call up scenes.
Saving stores the channel status.
It does not matter how this status is produced (whether via switch commands, central objects or the buttons on the device).
The saved status is restored when it is called up.

All scene numbers from 1 to 64 are supported.
Each channel can participate in up to 8 scenes.

See appendix: Scenes

- **Object 4** "*Block scenes = 1, Enable scenes = 1*"

Blocks the scene function with a 1 or a 0 depending on the configuration.
As long as it is blocked, scenes cannot be saved or called up.

- **Object 5** "*On/Off feedback*"

Reports the current channel status.
The status can also be inverted depending on configuration.

- **Object 6** "*Time to next service, operating hours feedback* "

Only available if the operating hours counter function has been activated
(*Configuration options* parameter page).
Reports, depending on selected *Type of hour counter* (*Hour counter and service* parameter page), either the remaining period to the next service or the current status of the hour counter.

- **Object 7** "*Service required*"

Only available if the hour counter function has been activated (*Configuration options* parameter page) and *Type of hour counter = Counter for time to next service*.

Reports if the next service is due.
0 = not due
1 = service is due.

- **Object 8** "*Switching with priority, reset service, reset operating hours*"

The function of the object depends on whether or not the operating hours counter function has been activated (*Function selection* parameter page).

<table>
<tr><th>Activate hour counter</th><th>Function</th><th>Use</th></tr>
<tr><td rowspan="2">yes</td><td>Reset service[1]</td><td>Reset service interval counter.</td></tr>
<tr><td>Reset operating hours[2]</td><td>Reset hour counter</td></tr>
<tr><td>no</td><td>Switching with priority</td><td>Priority control:
<table>
<tr><th>Status of object 8</th><th>Channel status</th></tr>
<tr><td>0</td><td rowspan="2">as set by object 0</td></tr>
<tr><td>1</td></tr>
<tr><td>2</td><td>OFF</td></tr>
<tr><td>3</td><td>ON</td></tr>
</table></td></tr>
</table>

- **Objects 78, 158** "*Manual*"

Puts the relevant module in manual mode or sends the status of the manual operation.

Telegram	Meaning	Explanation
0	Auto	All channels can be operated via the bus as well as via the buttons.
1	Manual	The channels can only be operated via the buttons on the device. Bus telegrams will not work.

The duration of the manual mode, i.e. the *Function of the manual button* is set on the *General* parameter page.

[1] Depending on configuration.
[2] Depending on configuration.

- **Object 240** "*Central permanent ON*"

Central switch-on function.
Enables simultaneous switching on of all channels with one single telegram.
0 = no function
1 = Permanent ON

Participation in this object can be set individually for each channel (*Configuration options* parameter page).

IMPORTANT:
This object takes top priority.
As long as it is set, the other switch commands will not work on the participating channels.

- **Object 241** "*Central permanent OFF*"

Central switch-off function.
Enables simultaneous switching off of all channels with one single telegram.
0 = no function
1 = Permanent OFF

Participation in this object can be set individually for each channel (*Configuration options* parameter page).

IMPORTANT: This object has the second highest priority after *Central permanent ON*. As long as it is set, the other switch commands will not work on the participating channels.

- **Object 242** "*Central switching*"

Central switch function.

Enables simultaneous switching on or off of all channels with one single telegram.
0 = OFF
1 = ON
Participation in this object can be set individually for each channel (*Configuration options* parameter page).
With this object, every participating channel responds exactly as if its 1st object
(i.e. obj. 0, 10, 20, etc.) were receiving a switch command.

- **Object 243** "*Call up/save central scenes*"

Central object for using scenes.
This object can be used to save and subsequently call up "scenes".

See appendix: Scenes

- **Object 250** "*Version of bus coupling unit*"

For diagnostic purposes only.

Sends the bus coupling unit software version after reset or download.
Can also be read out via the ETS.

Format: **A**xx **H**yy **V**zzz

Code	Meaning
xx	00 .. FF = Version of application without dividing point (17 = V1.7, 18 = V1.8 etc).
yy	Hardware version 00..99
zzz	Firmware version 000..999

EXAMPLE: A10 H00 V09
- ETS application version 1.0
- Hardware version $00
- Firmware version $09

- **Object 251** "*Firmware version*"

For diagnostic purposes only.

Sends the software version (firmware) of the basic module after reset or download.
Can also be read out via the ETS.

The version is issued as an ASCII character string.
Format: **M**xx **H**yy **V**zzz

Code	Meaning
xx	01 .. FF = Module code (hexadecimal).
yy	Hardware version 00..99
zzz	Firmware version 000..999

EXAMPLE: M18 **H**00 **V**01
- Module $18 = GSAB-4K KNX
- Hardware version V00
- Firmware version V01

3.3 Parameter

3.3.1 Parameter pages

Table 5

Function	Description
General	General parameters: Manual button, relay switch delay.
Channel Cx Configuration options	Characteristics of channel and activation of additional functions (scenes, links, etc.).
Contact characteristics	Type of contact and status after download, bus failure etc.
Threshold	Settings for triggering channel function through exceeding threshold.
Block function	Type of block telegram and response to blocking.
Scenes	Selection of scene numbers relevant to the channel.
Feedback	Status of feedback object etc.
Hour counter and service	Type of hour counter and, if required, service interval etc.
Link	Selection of logical link.

3.3.2 Parameter description

Settings that lead to the display of other pages or functions are identified by .. .
Example: *Pulse function..*

3.3.2.1 The "*General*" parameter page

Designation	Values	Description
Function of the manual button	*applies for 24 hours or until reset via object* *blocked* ***applies until reset via object*** *applies for 30 minutes or until reset via object* *applies for 1 hour or until reset via object* *applies for 2 hours or until reset via object* *applies for 4 hours or until reset via object* *applies for 8 hours or until reset via object* *applies for 12 hours or until reset via object*	Determines how long the device works manually and how this is ended. In manual mode, the channels can only be switched on and off via the buttons on the device. See also: object 78
Manual operation of the channels	***enabled*** *blocked*	The channels can be operated via the buttons on the device. No manual operation, the buttons on the device are blocked..

Continuation:

Designation	Values	Description
Relay switch delay		This parameter sets the minimum delay between switching on 2 relays if several are activated at the same time. The shortest delay is achieved by using the central switch object (object 242). When switching on via individual telegrams (1 telegram per channel) , the bus running times and the sequential processing of commands cause an additional delay. This can help avoid high current peaks when devices are switched on simultaneously (e.g. with a number of lighting strips). ***None*** There is no added delay. *60 ms* *100 ms* *200 ms* When a relay switches on, the next one can only switch on after the set delay is completed. The switch-on delay between the first and last relay is calculated according to the following formula: (Number of channels – 1) x delay **Example:** GSAB-4K KNX and 60 ms: = (4 channels – 1) * 60 ms = 180 ms → Channel C4 switches 180 ms after C1.

3.3.2.2 The "*Channel Cx: Configuration options*" parameter page

Table 6

Designation	Values	Description
Copy main parameters from channel C1		For channels C2..C4 only. The copy function simplifies the configuration of identical channels by many settings only having to be entered on the 1st channel.
	Yes	The following parameter settings are taken directly from channel C1: - Channel function - Adjust block function - Participation in central objects - Adjust feedback
	no	No settings are taken from C1.
Channel function	***Switching On/Off..*** *On/off time delay..* *Pulse function..* *Staircase light time switch with forewarning function..* *Flashing..*	Determines the basic functionality of the channel.
Activation of function via	***Switch object***	The channel is operated via a 1-bit object.
	Exceeding the threshold	The channel is operated through exceeding a 1 or 2-byte threshold. See below: The "Threshold" parameter page
Adjust block function	*Yes..*	The block function can be individually adjusted. The relevant parameter page is shown.
	no	The block function works with the standard parameters: - *Block with ON telegram* - *When setting the block: Unchanged* - *When cancelling: Update.*
Activate scenes	*Yes..* ***no***	Should scenes be used?

Continuation:

Designation	Values	Description
Participation in central objects	***no***	Central objects are not taken into account.
	at Central switching, Permanent On, Permanent OFF *only in central permanent ON* *only in central permanent OFF* *only in central switching* *only in central switching and permanent ON* *only in central switching and permanent OFF* *only in central permanent On and permanent OFF*	Which central objects are to be taken into account? Central objects enable simultaneous switching on and off of several channels with one single object.
Adjust feedback	*Yes.*.	The feedback function can be individually adjusted. The relevant parameter page is shown.
	no	The *Feedback* function works with the standard parameters: *- not inverted* *- do not transmit cyclically*
Activate hour counter	*Yes.*. ***no***	Is the *hour counter/service interval* function to be used?
Activate link	*Yes.*. ***no***	Are logical links to be used with the channel object?

3.3.2.3 The "*Contact characteristics*" parameter page

Table 7

Designation	Values	Description
Type of contact	***NO contact***	Standard: The relay contact is closed when a switch-on command is issued.
	Opening contact	Inverted: The relay contact is opened when a switch-on command is issued.
Status with download and bus failure		After download or with loss of bus voltage…
	OFF	..the relay remains switched off.
	ON	..the relay switches on.
	unchanged	…the relay remains in the same state as before.
Status after restoration of the mains supply or bus supply		After return of mains or bus voltage…
	OFF	..the relay remains switched off.
	ON	..the relay switches on.
	Same as before failure	…the relay remains in the same state as before.

3.3.2.4 The "*On/Off delay*" parameter page

This parameter page appears if *On/Off delay* is chosen as the *Channel function*.

Table 8

Designation	Values	Description
Switch-on delay		
hours (0..3)	***0**..3*	Input of desired switch-on delay in hours.
minutes (0..60)	***0**..60*	Input of desired switch-on delay in minutes.
seconds (0.225)	***0**..255*	Input of desired switch-on delay in seconds.
Switch-off delay		
hours (0..3)	***0**..3*	Input of desired switch-off delay in hours.
minutes (0..60)	***0**..60*	Input of desired switch-off delay in minutes.
seconds (0.255)	***0**..255*	Input of desired switch-off delay in seconds.

3.3.2.5 The "*Pulse function..*" parameter page

This parameter page appears if *Pulse function* is chosen as the *Channel function*.

Table 9

Designation	Values	Description
hours (0..3)	***0**..3*	Input of desired pulse duration in hours.
minutes (0..60)	***0**..60*	Input of desired pulse duration in minutes.
seconds (0.255)	***0**..255*	Input of desired pulse duration in seconds.
Pulse can be retriggered (with 1 on switch object)	*Yes* ***no***	The pulse can be extended as often as desired via a 1-telegram The pulse cannot be extended.
Pulse can be reset (with 1 on switch object)	*Yes* ***no***	The pulse can be ended early at anytime via a 0-telegram. The pulse cannot be ended early

3.3.2.6 The "*Staircase light with forewarning function ..*" parameter page

This parameter page appears if *Staircase light with forewarning function* is chosen as the *Channel function*.
The user can, anytime, press a push button again, to extend the staircase light time.

Table 10

Designation	Values	Description
Staircase light time (min. 1 s)		
hours (0..3)	***0**..3*	Input of desired staircase light time in hours.
minutes (0..60)	***0**..60*	Input of desired staircase light time in minutes.
seconds (0.255)	*0..255* Default value = ***1***	Input of desired staircase light time in seconds.
The maximum sum of pulses 1..40	*1..40*	determines how often the staircase light time can be extended (restarted) by pressing the button again.
Duration of 1st forewarning in s (0..60)	*0* *1..60* Default value = *10*	The light switches off immediately once the staircase light time is completed. Once the staircase light time is completed, the light should briefly flash and then stay on for the duration of the forewarning
Duration of 2nd forewarning in s (0..60)	0 *1..60* Default value = *10*	No 2nd forewarning. The light switches off at the end of the 1st forewarning. Second forewarning: Once the 1st forewarning is completed, the light should flash briefly and then stay on for the duration of the 2nd forewarning. The light switches off when this time is completed.

Example of forewarning function:

Staircase light time	Flashing	1st forewarning	Flashing	2nd forewarning	OFF

3.3.2.7 The "*Flashing..*" parameter page

This parameter page appears if *Flashing* is chosen as the *Channel function*.

Table 11

Designation	Values	Description
ON phase of flash pulse		
hours (0..3)	***0**..3*	Input of desired pulse time (t_i) in hours.
minutes (0..60)	***0**..60*	Input of desired pulse time in minutes.
seconds (0.255)	***0**..255*	Input of desired pulse time in seconds.
OFF phase of flash pulse		
hours (0..3)	***0**..3*	Input of desired length of break (t_p) in hours.
minutes (0..60)	***0**..60*	Input of desired length of break in minutes.
seconds (0.255)	***0**..255*	Input of desired length of break in seconds.
How often should it flash	*Until it switches off* *1 x* *2 x* ***3 x*** *4 x* *5 x* *7 x* *10 x* *15 x* *20 x* *30 x* *50 x*	The channel flashes until a switch-off telegram is received. The channel flashes as often as set here.

3.3.2.8 The "*Threshold*" parameter page

This side is shown if the *Activation of the function by* parameter is set to *Exceeding threshold*.

Table 12

Designation	Values	Description
Type of threshold object	***Object type: Percent (DPT 5.001)*** *Object type: Counter value 0..255 (DPT 5.010)* *Object type: Counter value 0..65535 (DPT 7.001)* *Object type: EIS5 e.g. CO2, brightness etc. (DPT 9.xxx)*	Value type for threshold.
Response on exceeding the threshold		Should the channel switch on or off on exceeding the threshold? The set *type of contact* must be taken into account here.
	As switch object = 0	*NO contact*: the relay switches **off** if threshold is exceeded. *Opening contact:* The relay switches **on** if threshold is exceeded.
	As switch object = 1	*NO contact*: The relay switches **on** if threshold is exceeded. *Opening contact:* the relay switches **off** if threshold is exceeded.
Parameter for *Percent* threshold object		
Threshold	*1..99%* *Default value = **50%***	Desired threshold. Example of *NO contact* with response *as switch object = 1*: Switches on when: Object value > threshold Switches off when: Object value < threshold - hysteresis
Hysteresis (as %)	*1..99%* *Default value = **10%***	The hysteresis prevents frequent switching after small fluctuations in readings.

Continuation:

Designation	Values	Description
Parameter for threshold object *Counter value 0..255*		
Lower threshold	*1..254* *Default value = **127***	Desired threshold. Example of *NO contact* with response *as switch object = 1*: Switches on when: Object value > threshold Switches off when: Object value < threshold - hysteresis
Hysteresis	*1..254* *Default value = **5***	The hysteresis prevents frequent switching after small fluctuations in readings.
Parameter for threshold object *Counter value 0..65535*		
Lower threshold	*1..65534* *Default value = **1000***	Desired threshold. Example of *NO contact* with response *as switch object = 1*: Switches on when: Object value > threshold Switches off when: Object value < threshold - hysteresis
Hysteresis	*1..65534* *Default value = **5***	
Parameter for threshold object *EIS5 (e.g. CO_2, brightness…)*		
Lower threshold *Format (-)0.00..99999*	*0.00..99999* *Default value = **20***	Desired threshold. Example of *NO contact* with response *as switch object = 1*: Switches on when: Object value > threshold Switches off when: Object value < threshold - hysteresis
Hysteresis *0.00..9999*	*0.00..9999* *Default value = **1***	The hysteresis prevents frequent switching after small fluctuations in readings.

3.3.2.9 The "*Block function*" parameter page

This page appears when *Adjust block function* is selected on the *Configuration options* parameter page.

Table 13

Designation	Values	Description
Block telegram	***Block with ON telegram***	0 = Cancel block 1 = Block
	Block with OFF telegram	0 = Block 1 = Cancel block **Note:** The block is always deactivated after reset.
Response when setting the block	*OFF*	Switch off
	ON	Switching on
	unchanged	No response
Response when cancelling the block	*OFF*	Switch off
	ON	Switching on
	Unchanged	No response
	update	Restore normal operation and switch relay accordingly.

3.3.2.10 The "*Scenes*" parameter page

This page appears when the *Scenes* are activated on the *Configuration options* parameter page.
Each channel can participate in up to 8 scenes.

Table 14

Designation	Values	Description
Block telegram for scenes	***Block with ON telegram***	0 = Cancel block 1 = Block
	Block with OFF telegram	0 = Block 1 = Cancel block **Note:** With this setting the scenes are always locked immediately after reset or download.
All channel scene statuses	***Overwrite on download***	A download deletes all scene memories in a channel, i.e. all previously taught-in scenes. When a scene number is called, the channel assumes the configured *Status after download* (see below). See appendix: Teach in scenes without telegrams
	Unchanged after download	All previously taught-in scenes are saved. However, the scene numbers the channel should react to can be changed (see below: *Channel reacts to*).
Participation in central scene object	***No*** *yes*	Should the device react to the central scene object?
Channel reacts to	*No scene number* ***Scene number 1*** *Scene number 63*	First of the 8 possible scene numbers the channel is to react to.
Status after download	***Off*** *On*	New switching status that the selected scene number is to be allocated to. Only possible if the scene statuses are to be overwritten after download.
Permit teach in	***No***	Scenes can only be called up.
	Yes	The user can both call up and teach in or amend scenes.

Continuation:

Designation	Values	Description
Channel reacts to	*No scene number* *Scene number1* ***Scene number 2*** … *Scene number 63*	Second of the 8 possible scene numbers
Status after download	***Off*** *On*	See above.
Permit teach in	*No* ***Yes***	See above.
Channel reacts to	*No scene number* *Scene number1* … ***Scene number 3*** … *Scene number 63*	Third of the 8 possible scene numbers
Status after download	***Off*** *On*	See above.
Permit teach in	*No* ***Yes***	See above.
Channel reacts to	*No scene number* *Scene number1* … ***Scene number 4*** … *Scene number 63*	Fourth of the 8 possible scene numbers
Status after download	***Off*** *On*	See above.
Permit teach in	*No* ***Yes***	See above.
Channel reacts to	*No scene number* *Scene number1* … ***Scene number 5*** … *Scene number 63*	Fifth of the 8 possible scene numbers
Status after download	***Off*** *On*	See above.
Permit teach in	*No* ***Yes***	See above.
Channel reacts to	*No scene number* *Scene number1* … ***Scene number 6*** … *Scene number 63*	Sixth of the 8 possible scene numbers

Continuation:

Designation	Values	Description
Status after download	***Off*** *On*	See above.
Permit teach in	*No* ***Yes***	See above.
Channel reacts to	*No scene number* *Scene number1* … ***Scene number 7*** … *Scene number 63*	Seventh of the 8 possible scene numbers
Status after download	***Off*** *On*	See above.
Permit teach in	*No* ***Yes***	See above.
Channel reacts to	*No scene number* *Scene number1* … ***Scene number 8*** … *Scene number 63*	Last of the 8 possible scene numbers
Status after download	***Off*** *On*	See above.
Permit teach in	*No* ***Yes***	See above.

3.3.2.11 The "*Feedback*" parameter page

This page appears when *Adjust feedback* is selected on the *Configuration options* parameter page.

Table 15

Designation	Values	Description
Reported status	***Not inverted***	Channel switched on: feedback object sends a 1
	inverted	Channel switched on: feedback object sends a 0
Transmit feedback cyclically	***No*** *yes*	Send at regular intervals?
Time for cyclical transmission of feedback	*2 minutes, 3 minutes, 5 minutes, 10 minutes,* ***15 minutes****, 20 minutes, 30 minutes, 45 minutes 60 minutes*	At what interval?

3.3.2.12 The "*Hour counter and service*" parameter page

This page appears when *Activate operating hours counter* is selected on the *Configuration options* parameter page.

Table 16

Designation	Values	Description
Type of hour counter	***Hour counter*** *Counter for time period before next service*	Forward counter for duty cycle of the channel. Backward counter for duty cycle of the channel.
Hour counter		
Reporting of operating hours when changing (0..100 h, 0 = no report)	*0..100* *Default value = **10***	At what interval is the current meter reading to be sent? Example: 10 = Send each time the meter reading increases by another 10 hours.
Report operating hours cyclically	***No*** *yes*	Send at regular intervals?
Time for cyclical transmission	*2 minutes, 3 minutes, 5 minutes, 10 minutes, 15 minutes, 20 minutes, 30 minutes, 45 minutes* ***60 minutes***	At what interval?
Counter for time period before next service		
Service interval (0..2000, x10 h)	*0..2000* *Default value = 100*	Desired timescale between 2 services. Example: 10 = 10 x 10 h = 100 hours
Reporting of time to service when changing (0..100 h, 0 = no report)	*0..100* *Default value = 10*	At what interval is the current meter reading to be sent? Example: 10 = Send each time the meter reading decreases by another 10 hours.
Report time to service cyclically	***no*** *Yes*	Send **remaining** time to next service at regular intervals? → Object *Time to next service*.
Report service cyclically	***no*** *Yes*	Send **expiry** of time to next service at regular intervals? → Object *Service required*.

Continuation:

Designation	Values	Description
Time for cyclical transmission (time to service and service	*2 minutes, 3 minutes, 5 minutes, 10 minutes, 15 minutes, 20 minutes, 30 minutes, 45 minutes* ***60 minutes***	At what interval?

3.3.2.13 The "*Link*" parameter page

This page appears when *Activate link* is selected on the *Configuration options* parameter page.

An additional object appears, which forms a logical link in combination with the channel's switching/threshold object.
The channel only switches if the link requirement has been met.

Table 17

Designation	Values	Description
Activate link		Selection of logical link with the channel object
	AND link	The *Logic input in AND gate* object appears (e.g. object 1).
	OR link (override)	The *Logic input in OR gate* object appears (e.g. object 1).
	XOR link	The *Logic input in XOR gate* object appears (e.g. object 1).
Block object affects logic object	***No***	The block object only affects the channel object (e.g. object 0). If required, the logic object can activate the channel function despite block (with OR and XOR link).
	yes	The block object affects the channel object and the logic object. The channel function is completely blocked if the block is active.

4 Appendix

4.1 The scenes

4.1.1 Principle

The current status of a channel can be stored and retrieved later via the scene function.

That applies to switching, blinds and dimming channels.
Each channel can participate simultaneously in up to 8 scenes.

This requires permission to access scenes for the relevant channel via parameter.
See Activate scenes parameter and Scenes parameter page.

The current status is allocated to the appropriate scene number when a scene is saved.
The previously saved status is restored when a scene number is called up.

This allows a system to be easily associated with any user scene.
Permitted scene numbers: 1…64

The scenes are permanently stored and remain intact even after the application has been downloaded again.
See All channel scene statuses parameter on the Scenes parameter page.

4.1.2 Calling up or saving scenes:

To call up or store a scene the relevant code is sent to the scene object (obj. 243).

Table 18

Scene	Call up		Save	
	Hex.	Dec.	Hex.	Dec.
1	$00	0	$80	128
2	$01	1	$81	129
3	$02	2	$82	130
4	$03	3	$83	131
5	$04	4	$84	132
6	$05	5	$85	133
7	$06	6	$86	134
8	$07	7	$87	135
9	$08	8	$88	136
10	$09	9	$89	137
11	$0A	10	$8A	138
12	$0B	11	$8B	139
13	$0C	12	$8C	140
14	$0D	13	$8D	141
15	$0E	14	$8E	142
16	$0F	15	$8F	143
17	$10	16	$90	144
18	$11	17	$91	145
19	$12	18	$92	146
20	$13	19	$93	147
21	$14	20	$94	148
22	$15	21	$95	149
23	$16	22	$96	150
24	$17	23	$97	151
25	$18	24	$98	152
26	$19	25	$99	153
27	$1A	26	$9A	154
28	$1B	27	$9B	155
29	$1C	28	$9C	156
30	$1D	29	$9D	157
31	$1E	30	$9E	158
32	$1F	31	$9F	159

Continuation:

Scene	Call up		Save	
	Hex	Dec.	Hex	Dec.
33	$20	32	$A0	160
34	$21	33	$A1	161
35	$22	34	$A2	162
36	$23	35	$A3	163
37	$24	36	$A4	164
38	$25	37	$A5	165
39	$26	38	$A6	166
40	$27	39	$A7	167
41	$28	40	$A8	168
42	$29	41	$A9	169
43	$2A	42	$AA	170
44	$2B	43	$AB	171
45	$2C	44	$AC	172
46	$2D	45	$AD	173
47	$2E	46	$AE	174
48	$2F	47	$AF	175
49	$30	48	$B0	176
50	$31	49	$B1	177
51	$32	50	$B2	178
52	$33	51	$B3	179
53	$34	52	$B4	180
54	$35	53	$B5	181
55	$36	54	$B6	182
56	$37	55	$B7	183
57	$38	56	$B8	184
58	$39	57	$B9	185
59	$3A	58	$BA	186
60	$3B	59	$BB	187
61	$3C	60	$BC	188
62	$3D	61	$BD	189
63	$3E	62	$BE	190
64	$3F	63	$BF	191

Examples (central or channel-related)**:**

Select status of scene 5:
→ Send $04 to the relevant scene object.

Save current status with scene 5:
→ Send $84 to the relevant scene object.

4.1.3 Teach in scenes without telegrams

Instead of defining scenes individually by telegram, this can be done in advance in the ETS.
This merely requires the setting of the *All channel scene statuses* parameter (*Scenes* parameter page) to *overwrite at download*.

Accordingly, the required status can be selected for each of the 8 possible scene numbers in a channel (= *Status after download* parameter).
The scenes are programmed into the device after the download has been completed.

Later changes via teach in telegrams are possible if required and they can be permitted or blocked via parameter.

4.2 Conversion of percentages to hexadecimal and decimal values

Percentage value	**0%**	**10%**	**20%**	**30%**	**40%**	**50%**	**60%**	**70%**	**80%**	**90%**	**100%**
Hexadecimal	00	1a	33	4D	66	80	99	B3	CC	E6	FF
Decimal	00	26	51	77	102	128	153	179	204	230	255

All values from 00 to FF hex. (0 to 255 dec.) are valid.