KNX
Product documentation

Issue:
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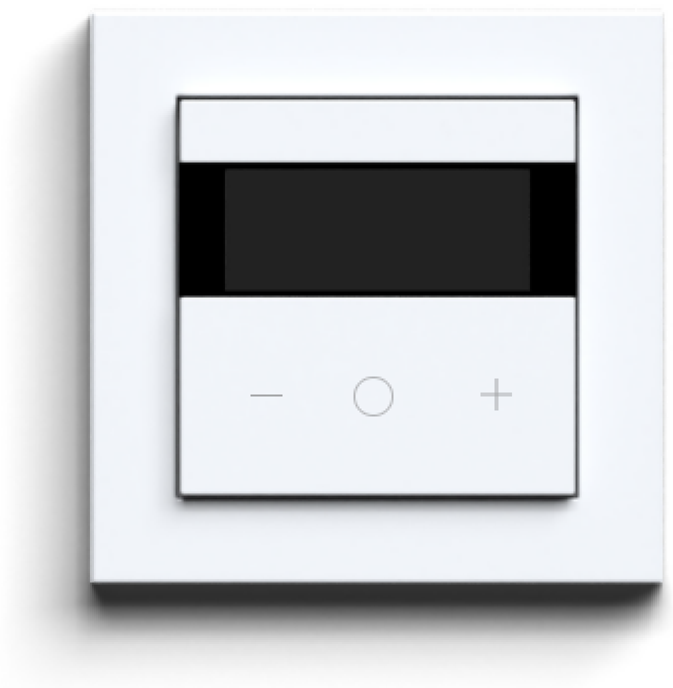
GIRA

Room climate sensor Komfort
Art. no. 2005 00



Product image non-binding

Table of contents

1 Information on the product

1.1 Product catalogue

Product name	Room climate sensor Komfort
Art. no.	2005 00
Use	Sensor
Design	FM (flush-mounted)

1.2 Function

General

The product can support energy-efficient, user-friendly and reliable control of modern heating control systems with an integrated room temperature controller.

In this configuration, the device itself is not involved in temperature control.

The structured and intuitive presentation of the display and control surfaces enables user-friendly operation without the need for instruction. At the same time, the device can support efficient control and monitoring of comfort functions in the room climate area, both in hotels and in general building applications.

Display

The device is used for the clear visualisation and control of room climate functions via an integrated display. The indicator is segment-based and provides the user with all relevant information to quickly and clearly record the current operating status.

Operating mode display, main and secondary display, humidity and air quality display are available. In addition, special statuses such as window status, operating lock, boost function, heating and cooling mode are displayed. Even when switched off, the display ensures clear status feedback.

Controller extension

The device can be used for extension unit operation, allowing central heating control devices with an integrated room temperature controller to be controlled.

Room temperature controllers generally offer different ways of influencing the room temperature control. These include the operating mode switchover and setpoint temperature shift options.

In extension unit mode, the device is operated via the control panels.

The operating elements can be used to control a room temperature controller by changing the operating mode and adjusting the setpoint temperature.

Extensions

The device has 4 independent extension channels. These channels can be used as inputs or outputs. Channel 1 can be used as a binary input or to connect a temperature sensor. The device can read in up to 4 contact states potential-free via the inputs in event of a shared reference potential and transmit telegrams on the bus accordingly.

With the push-button connected, telegrams for switching, forced position, dimming the brightness or colour temperature, shading control, transmitting values, calling up or switching a scene as scene extension unit or operating a room temperature controller with the room temperature control point can be transmitted on the bus in the "push-button" channel function. Optionally, different telegrams can be transmitted on the bus by pressing the button briefly or for a long time. The contact type of the push-buttons can be parameterised in the process.

i The "push-button" channel function is recommended if telegrams are to be transmitted on the KNX, depending on how long the channel/push-button was actuated. For example in the "dimming", "venetian blind", " value transmitter with value adjustment", "telegram upon short or long button actuation" functions or with the "RGB(W) colour adjustment".

With the switch connected, telegrams for switching, forced position, transmitting values, calling up or switching a scene as scene extension unit or operating a room temperature controller with the room temperature control point can be transmitted on the bus by means of one or two objects in the "switch" channel function. One value can be parameterised when closing and one value when opening the contact.

i The "switch" channel function is recommended if telegrams are to be transmitted cyclically on the KNX. This allows monitoring, similar to the heartbeat, to be implemented or rising and falling edges - like with the switch - to be evaluated regardless of the time.

With the door or window contacts connected, different window or door states can be evaluated and corresponding telegrams transmitted to the bus in the "door/window status" channel function.

With the leakage or condensation sensor connected, the leakage or condensation status can be evaluated and corresponding telegrams transmitted on the bus in the "leakage/condensation sensor" channel function.

In the "pulse meter" channel function, the channel counts the number of pulses at the input. Die "pulse meter" channel function includes the evaluation of a main meter and intermediate meter.

i For channel 1 only: With the temperature sensor connected, the temperature can be evaluated and corresponding telegrams transmitted to the bus in the "temperature sensor" channel function. Optionally, the temperature measurement of the connected sensor can be supplemented by an external temperature value via the bus.

In the "output" channel function, the channels can control loads as independent outputs, e. g. suitable LEDs (technical data). To increase the output current, these channels can also be switched in parallel to each other with the same parametrisation. The outputs are short-circuit resistant, overload-protected and reverse-polarity protected.

i The connection of 230 V signals or other external voltages to the inputs is not permitted!

Logic function

The device has a wide range of logic functions.

Eight separate logic functions can be activated. Using these functions, logic gates (e. g. AND, OR, exclusive OR, each with up to 4 inputs) can be set up and thus switching and status information can be linked and evaluated. Alternatively, a one-bit to one-byte converter and a disabling element with filter and time functions can be configured for each logic function. As a further option, comparators or limit value switches with hysteresis can be set as a logic function.

The logic functions have their own KNX communication objects and can process telegrams of other KNX devices.

Sensor

The device is used to record and transmit central room climate parameters to support precise and energy-efficient room temperature control. The integrated temperature sensor reliably measures and provides the local room temperature. Optionally, the temperature measurement can be supplemented via a receiving object to increase the accuracy of the measurement result.

In addition to temperature detection, the device has an integrated humidity sensor that measures and transmits the current room humidity. A dew point temperature can be determined from the measurement of the room temperature and the room humidity, which can be sent to the bus. An alarm can also be sent to the bus before the dew point temperature is reached to prevent moisture damage if necessary. In addition, three measurements can be carried out via the device to determine the air quality.

An integrated VOC sensor enables the detection of volatile organic compounds (VOC). Based on these values, the device also calculates VOC (IAQ) indicators and corresponding eCO_2 values, ensuring a comprehensive assessment of the air quality.

ETS

The device is KNX Data Secure capable. KNX Data Secure offers protection against manipulation in building automation and can be configured in the ETS project. Detailed technical knowledge is a prerequisite. A device certificate, which is attached to the device, is required for safe commissioning. During mounting, it is recommended to remove the certificate from the device and to store it securely.

The device can be updated. Firmware can be easily updated with the Gira ETS Service App (additional software).

1.3 Device components

1.3.1 Front view

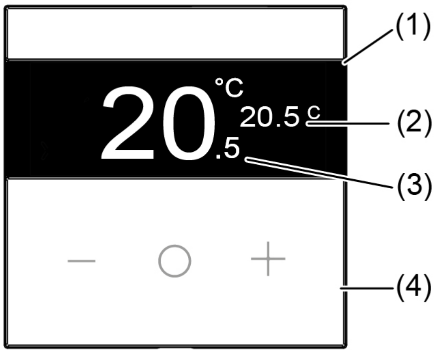


Figure 1: Front view

(1)	Display
(2)	Target temperature / humidity
(3)	Actual-temperature
(4)	Operating element (operating buttons 1 - 3)

1.3.2 Rear view

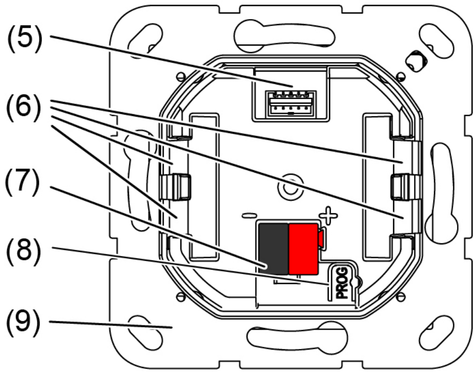


Figure 2: Rear view

(5) Device connection terminal for remote sensor / extensions (only "Comfort" variant)

(6) Retaining clips for device fixation at the supporting frame

(7) Device connection terminal, bus

(8) Programming button with programming LED

(9) Supporting frame

1.3.3 Icons of the operating element

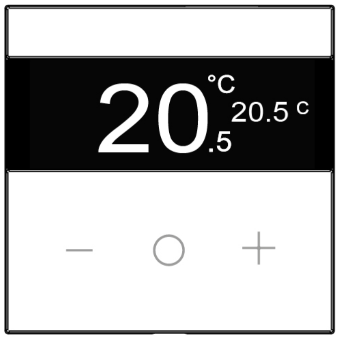


Figure 3: Icons of the operating element

+ Pressing the button leads to an increase in the setpoint value.

− Pressing the button leads to a reduction in the setpoint value.

O ON / OFF: The device is switched on/off with a long press of the button.

Change operating mode and display of measured values: A short press of the button switches between the operating modes and the display of measured values.

1.3.4 Icons in the display

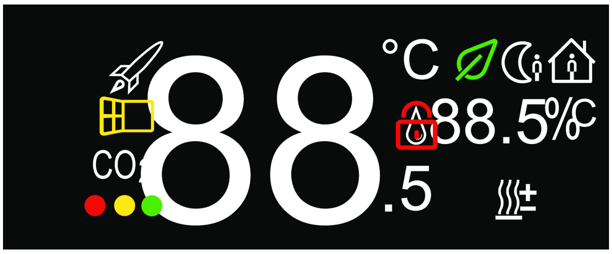


Figure 4: Icons in the display

 Comfort operating mode is active

 Reduction temperature operating mode is active

 Night setback operating mode is active

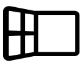
 Eco operating mode is active

 Operating lock is activated

 Air humidity

 Heating/cooling

 The boost function is active

 Window status (open window was recognised)

Air quality status (VOC, VOC (IAQ), eCO2)
Green = good
Yellow = medium
Red = bad

1.4 As-delivered state

On delivery, the device only shows two "-" in the main segment of the display. All other segments of the display are hidden. The display backlight is set to 100 % brightness.

In the state as delivered, the device does not send any telegrams to the KNX bus. The application is also unloaded, which means that the device is in a neutral basic state.

This preconfigured delivery status remains unchanged until the device has been parameterised and configured for the specific project.

1.5 Technical data

Ambient conditions	
Ambient temperature	-5 ... +45 °C
Storage/transport temperature	-20 ... +70 °C
Relative humidity	5 ... 95% (no moisture condensation)
Protection class	III
Installation dimensions (see figure 5)	
Construction height	A = 10 mm
Installation depth	B = 19 mm

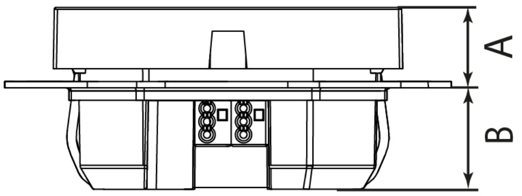


Figure 5: Installation dimensions

KNX	
KNX medium	TP256
KNX commissioning mode	S mode
Rated voltage	DC 24 ... 30 V SELV
Current consumption KNX	8 ... 14 mA
Connection mode KNX	Standard device connection terminal
Connecting cable KNX	EIB-Y (St)Y 2x2x0.8
Information according to ErP 2009/125/EC	
Electronic room temperature controller	yes
Power consumption	
– In networked standby mode	< 0.5 W
– In standby mode with information or status indication	yes
Control accuracy	yes (0.5 K)
This controller fulfils the following control functions	HP(1/2/3/0/0/0/0/8)
Inputs for potential-free contacts	
Number of inputs	4
(K1 can be used for NTC temperature sensors)	
Output voltage	DC 5 V SELV
Output current	max. 3.2 mA
LED current	2.2 mA per output
Connection of channels	5-core wiring harness

Connection cable for remote sensor, condensation and leakage sensor, extensions (see accessories)

Cable type extension	NYM-J 3×1.5 or J-Y(St)Y 2×2×0.8
Length, wiring harness	25 cm, can be extended to max. 30 m

1.5.1 Product information in accordance with the Ecodesign Directive (ErP 2009/125/EC)

1.5.1.1 Ecodesign Table 6

Contact details: Gira Giersiepen GmbH & Co. KG, Dahlienstraße, 42477 Radevormwald, Germany			
Model identifier: Room climate sensor Standard, 2004 00 Room climate sensor Komfort, 2005 00			
Specification	**Icon**	**Value**	**Unit**
Power consumption			
In the off state	P_0	-	W
In standby mode	P_{sm}	-	W
In idle state	P_{idle}	-	W
In networked standby mode	Pnsm	< 0.5	W
In standby mode with information or status display		yes	
Type			
Single-stage heat output, no room temperature control		no	
Two or more manual levels, no room temperature control		no	
Room thermostat with mechanical thermostat		no	
Electronic room temperature controller		yes	
Electronic room temperature controller with time-of-day control		no	
Electronic room temperature controller with weekday regulation		no	
Other control options			
Presence detection		yes	
Detection of open windows		yes	
Remote control option		yes	
Adaptive control of the start of heating		no	
Operating time limit		no	
Black ball sensor		no	
Self-learning function		no	
Control accuracy		yes (0.5 K)	

1.5.1.2 Ecodesign Table 7

Codes of the control functions

The format of the code is TC (f1/f2/f3/f4/f5/f6/f7/f8), where TC is the code for temperature control and f1 to f8 are the codes for the respective control functions, if available; otherwise "0" must be specified.

		(TC)*	Control functions							
			f1	f2	f3	f4	f5	f6	f7	f8
Type of temperature control	Single-stage heat output, no room temperature control	NC								
	Two or more manual levels, no room temperature control	TX								
	Room thermostat with mechanical thermostat	TM								
	Electronic room temperature controller	HP								
	Electronic room temperature controller with daytime control	TD								
	Electronic room thermostat with weekday control	TW								
Control functions	Presence detection		1							
	Detection of open windows			2						
	Remote control option				3					
	Adaptive control of the start of heating					4				
	Operating time limit						5			
	Black ball sensor							6		
	Self-learning function								7	
	Control accuracy with CA < 2 Kelvin and CSD < 2 Kelvin									8

* Temperature control code

1.6 Accessories

Remote sensor	Art. no. 1493 00
Leakage sensor	Art. no. 5068 00
Condensation sensor	Art. no. 5069 00

2 Safety instructions

Electrical devices may be mounted and connected only by electrically skilled persons.

To avoid potential damage, read and follow the following instructions:

Danger of electric shock. During installation and cable routing, comply with the regulations and standards which apply for SELV circuits.

Touch-sensitive surfaces can be damaged. Do not operate the device with sharp or pointed objects.

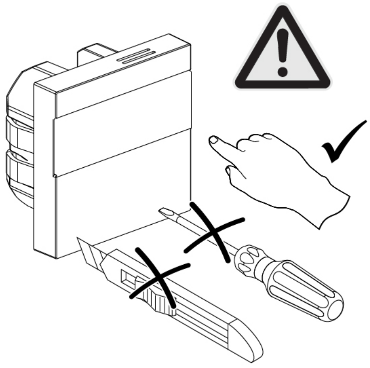


Figure 6: Damage to appliances due to sharp or pointed objects

3 Mounting and electrical connection

DANGER!

Danger of electrical shock when mains voltage 230 V or other external voltages are connected!

Electric shocks can be fatal.

Device may be destroyed.

Only connect potential-free push-buttons, switches or contacts.

3.1 Installation position

The device (see figure 7) is installed horizontally.

When installing the appliance, read the TOP labelling at the top Mounting and connecting the device.

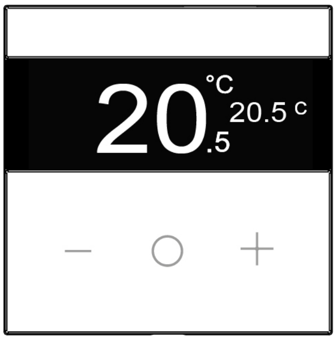


Figure 7: Room climate sensor

3.2 Mounting and connecting the device

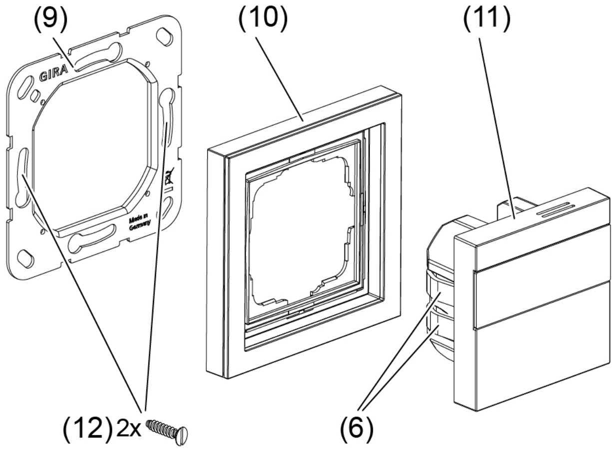


Figure 8: Mount device

(6)	Retaining clips for device fixation at the supporting frame
(9)	Supporting frame
(10)	Cover frame (accessory)
(11)	Device
(12)	Box screws

The device should be used in an air-tight appliance box. Otherwise temperature and humidity reading can be negatively influenced by draughts.

- Mounting in suitable appliance box. Observe cable routing and spacing.
- Only connect potential-free push-buttons, switches or contacts.
- Mount supporting frame on an appliance box.

i Note the TOP marking.

i Use the enclosed box screws.

- Connect bus line with device connection terminal observing the correct polarity (red = +, black = -).
- In secure mode: Enter or scan the device certificate and add it to the project. A high resolution camera should be used to scan the QR code.
- Optional Accessories: Push-buttons, switches, contacts. Connect LEDs or NTCs as shown in the connection examples using the enclosed connection cables. The connection examples (and) show how to use them with inputs, outputs and sensors.

i The matching cover frame for the device must be ordered separately.

- Fit the cover frame flush. The cover frame is fixed by the device.
- Attach the device with cover frame onto the supporting frame.

  The device can be put into operation.

i Make sure the that the retaining clips properly fit in the supporting frame.

The physical address is programmed (see chapter "Commissioning" Page 26) in the next work step.

Installation instructions

- To avoid interference from EMC radiation, the cables of the inputs should not be run in parallel to cables carrying mains voltage or to load cables.
- The voltage potentials of the connecting cables for the inputs and outputs are not galvanically isolated from the bus voltage.
  The connection cables effectively extend the bus line. The specification for the bus cable length (max. 1000 m) must be observed.
- Do not connect the COM connections of several room climate sensors together.
- Use channel 1 for NTC temperature sensors (see accessories).
- Switches, push-buttons, dew and leakage sensors can be connected to all channels.
- No series resistance required for the connection of LEDs.

When extending the enclosed cable set (see figure 9), observe the maximum cable length l: 25 cm, can be extended to max. 30 m.

The following applies: the COM cable for each cable set must not exceed the total maximum length of l.

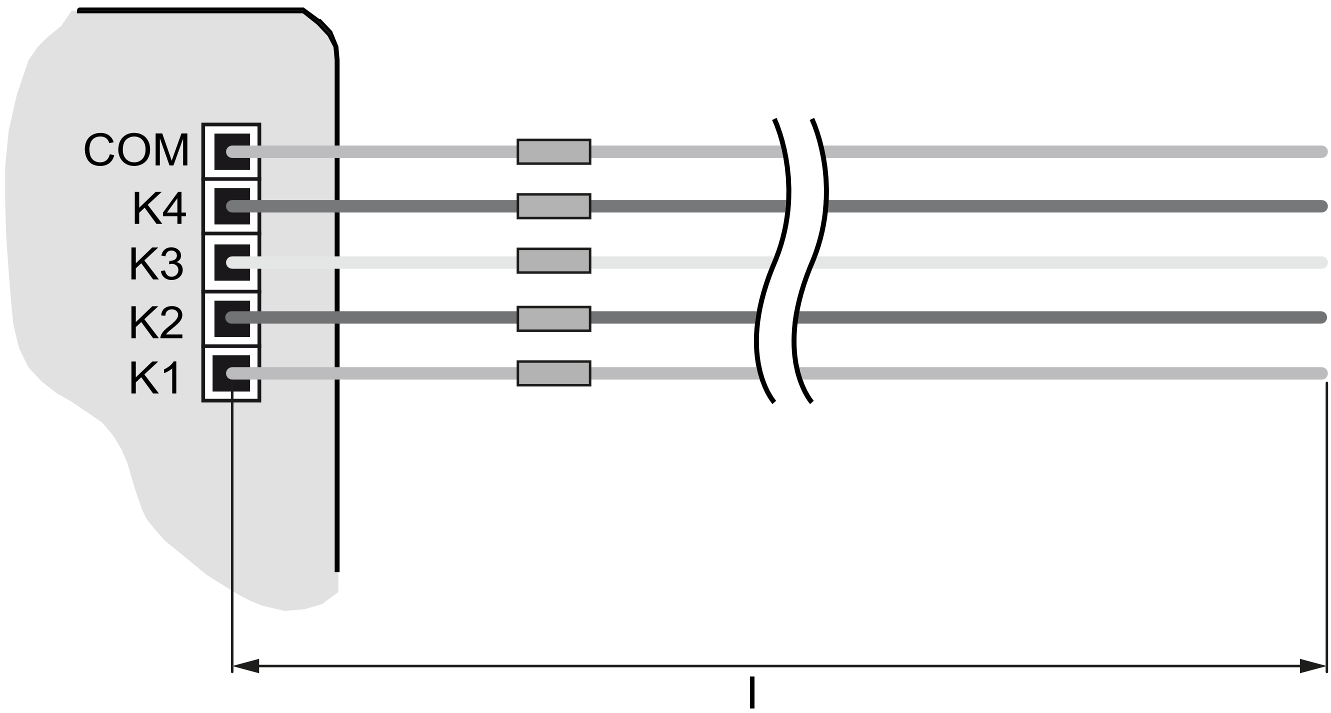


Figure 9: Maximum cable length

Connection of potential-free contacts

- Connect push-buttons, switches, contacts, LEDs or NTCs as shown in the connection examples using the enclosed connection cables ((see figure 10) and (see figure 11)). The connection examples show the use with inputs, outputs and sensors.

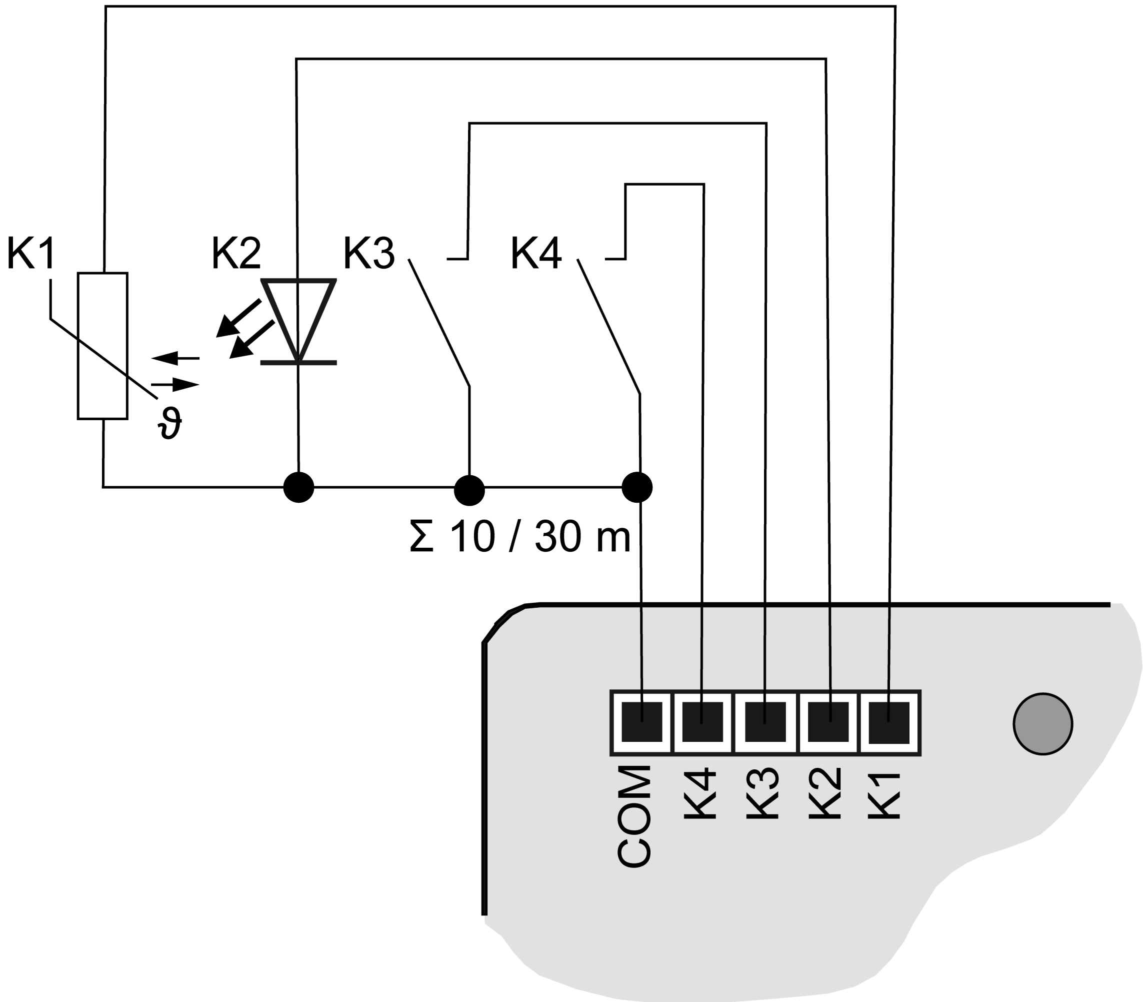


Figure 10: Connection example

It is possible to switch outputs in parallel, for loads with high energy consumption. (see figure 11) and K1-K3 are switched in parallel in this example.

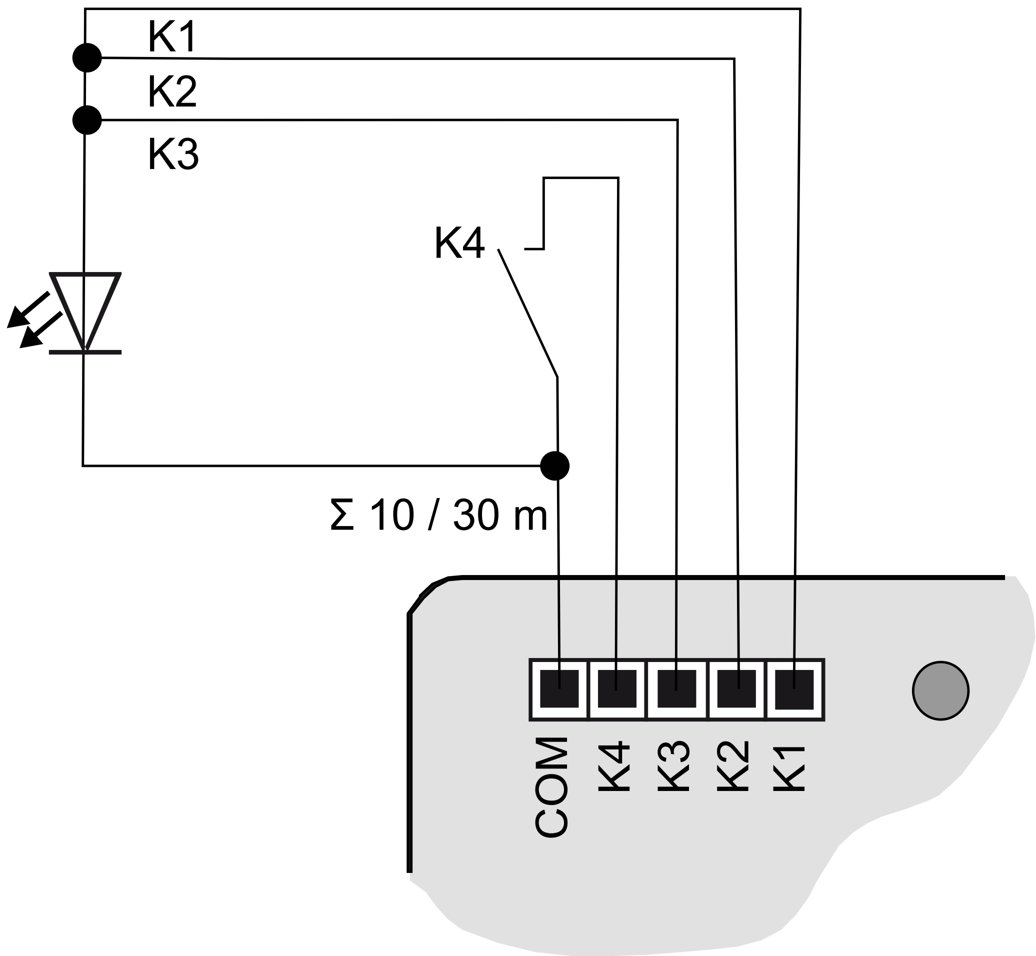


Figure 11: Connection example with outputs switched in parallel

3.3 Dismantling

- Carefully pull the device forwards together with the cover frame.

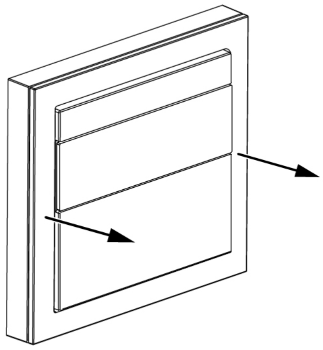


Figure 12: Dismantling the device

4 Commissioning

Programming the physical address and application program

ℹ Project design and commissioning with ETS version 5.7.7 and higher or 6.3.0.

In secure operation (prerequisites):

– Secure commissioning has been activated in the ETS.
– Device certificate entered/scanned or added to the ETS project. A high resolution camera should be used to scan the QR code.
– Document all passwords and keep them safe.

The programming button is located on the back of the appliance Rear view.

Precondition: The device is connected and ready for operation.

■ Activating Programming mode: push the programming button.
  The programming LED lights up red. Programming mode is activated.

■ Programming the physical address.
  The programming LED goes out. Physical address is programmed.

■ Programming the application program.
  The device is for use.

ℹ The display can be switched off temporarily while the application program is being programmed. As soon as the programming process has been successfully completed, the device switches on.

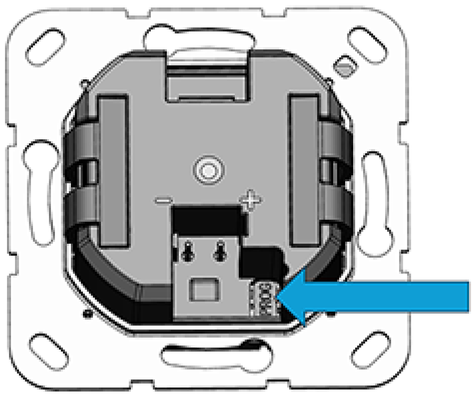


Figure 13: Programming button

4.1 Safe-state mode

The safe-state mode stops the execution of the loaded application program.

If the device does not work properly - for instance as a result of errors in the project design or during commissioning - the execution of the loaded application program can be halted by activating the safe-state mode. The device remains passive in safe-state mode, since the application program is not being executed (state of execution: terminated).

Only the system software of the device is still functional. ETS diagnosis functions and programming of the device are possible.

Activating safe-state mode

- Switch off the voltage.
- Press and hold down the programming button.
- Switch on voltage.

  Safe-state mode is activated. The programming LED flashes slowly (approx. 1 Hz).

Release the programming button only after the programming LED starts flashing.

Deactivating safe-state mode

- Switch off the voltage or carry out ETS programming.

4.2 Master reset

The master reset restores the basic device settings (physical address 15.15.255, firmware remains in place). The device must then be recommissioned with the ETS.

i In secure operation: A master reset deactivates device security. The device can then be recommissioned with the device certificate.

i Devices can be reset to factory settings with the ETS Service App. This function uses the firmware contained in the device that was active at the time of delivery (delivery state). Restoring the factory settings causes the devices to lose their physical address and configuration.

If the device - for instance as a result of errors in the project design or during commissioning - does not work properly, the loaded application program can be deleted from the device by performing a master reset. The master reset resets the device to delivery state. Afterwards, the device can be put into operation again by programming the physical address and application program.

Performing a master reset

Precondition: The safe-state mode is activated.

- Press and hold down the programming button for > 5 seconds until the programming LED starts flashing quickly.
- Release the programming button.

  The device performs a master reset. The programming LED is switched on.

  The device restarts and is in delivery state.

5 Operation

Touch-sensitive surfaces can be damaged. Do not operate the device with sharp or pointed objects.

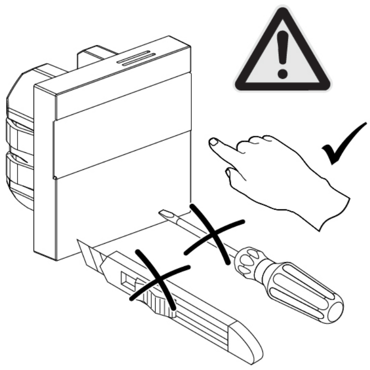


Figure 14: Damage to appliances due to sharp or pointed objects

The device is operated by pressing the buttons for a short, medium-long or long time, which depends on the specific functions configured.

Status	Min. length of time the button is pressed	Max. length of time the button is pressed
no keystroke recognised	0	≤ 50 ms
Brief pressing of a button	> 50 ms	≤1 s
Button press medium long	> 1 s	≤4 s
Pressing and holding a button	> 4 s	≤10 s

5.1 Examples for operating various standard applications

Increasing or decreasing the target temperature

- Short press(>50 ms) of the - or + button

  With every brief press of a button the setpoint temperature changes by 0.5 °C. The set value is retained in manual mode; in automatic mode it is retained until the next switching time is reached.

  If no operation is performed within a previously defined period of time (1 second) or if the O button is pressed briefly, the setpoint temperature is temporarily adopted. This is signalled by the device flashing twice.

In cooling mode, the – or + buttons cannot be used to change the setpoint temperature.

If the display is switched off, it is necessary to press the - or + button a second or further time before changing the setpoint.

- Medium-long press(>1 s) of the - or + button

  Each time the button is pressed for a medium length of time, the setpoint temperature changes by 0.5 °C at a faster rate. The set value is retained in manual mode; in automatic mode it is retained until the next switching time is reached.

  If no operation is performed within a previously defined period of time (1 second) or if the O button is pressed briefly, the setpoint temperature is temporarily adopted. This is signalled by the device flashing twice.

- Long press(>4 s) on the - or + button

  In heating mode, the stored setpoint temperature is retrieved:
  – = reduction temperature
  + = comfort temperature

i During a detected temperature drop, changing the setpoint temperature is not possible.

Display humidity (only "Comfort" variant with activated mode)

The function is only available for appliance variants with an integrated humidity sensor. If no humidity sensor is present, there is no reaction.

- Short press(>50 ms) of the O button

  When the O button is pressed briefly, the humidity is displayed last after the various modes have been run through. If no operation is performed for at least 7 seconds, the device returns to the standard view.

  If the O button is pressed again briefly, the display returns to the standard view (setpoint temperature display) and the first operating mode.

If no setting has been temporarily stored, the device jumps to the state specified by the actuator.

Window detector active

If a window is recognised as open, the window symbol is displayed and operation is blocked.

- Button press of any combination or duration

  When the window is open, the window symbol flashes twice to show that the device is locked.

  When the window is closed, the window symbol disappears and the operating lock is cancelled.

Display operating mode and associated setpoint temperature (only "Comfort" variant)

- Short press(>50 ms) of the O button

  A short press of the O button displays and applies the next operating mode and the associated setpoint temperature.

  When the last operating mode has been reached, the humidity is displayed the next time the button is pressed.

- Briefly press the O button within a defined period of time

  A short press of the button switches to the heating / cooling / eco operating mode.

Activating the operating lock

- Simultaneous medium-long(>1 s) press of the – and + buttons

  Pressing both buttons for a medium length of time activates the operating lock and the lock symbol appears on the display. The lock symbol flashes twice to show that the device has been locked.

  If both buttons are pressed again for a medium length of time, the lock symbol disappears and the operating lock is cancelled.

Switch off display

- Long press(>4 s) of the O button

  If you press and hold the O button, the device displays OFF for 3 seconds and then switches off the display.

  If the O button is pressed and held again, the device switches back to the initial state (as specified by the actuator).

Activating the boost function

With the boost function, the output is switched on for a maximum of 5 minutes without temperature control action in order to obtain a temporary increase in temperature.

i The boost function can be activated only in heating mode and if no temperature drop has been detected.

- Simultaneous medium-long(>1 s) press of the – and O buttons

  The boost function is active. The display counts down from 300 seconds and then switches back to normal mode.

To end the boost function prematurely, press the - and O buttons simultaneously for a medium length of time(>1 s).

6 Application programs

ETS search paths:	- Indication / Room climate sensor Komfort
Configuration:	S-mode standard

Application program available for Room climate sensor Komfort

Name	Room climate sensor Komfort 502021
Version	2.1 for ETS versions 5.7.7 and 6.3.0 and higher
from mask version	07B0
Summarized description	Multifunctional ETS application programme for the Room climate sensor Komfort. The application program enables the parameterisable control of heating control systems via KNX. It includes configuration options for temperature, humidity, air quality, operating modes and boost as well as flexible extension and logic functions. KNX Data Secure and the update capability via the ETS Service app ensure secure and future-proof commissioning.

7 Scope of functions

- Support for energy-efficient and reliable heating control
- No separate temperature control in the device
- Intuitive operation via structured display and control surfaces

Segment-based display with:

- Operating mode indication
- Main and secondary display
- Humidity and air quality display
- Display of window status, operating lock, boost function, heating/cooling mode, ventilation, automatic, ventilation, dehumidification

Operating function:

- Operating lock either automatically by time or via object
- On/off function

Heartbeat function:

- Check whether the application is running correctly.

Controller extension:

- Control of central heating control units with integrated room thermostat
- Operation via the operating elements
- Changing the operating mode of the room temperature controller
- Adjusting the setpoint temperature of the room temperature controller

4 independent extension channels:

- Binary input, push-button, switch, door/window status, leakage/condensation sensor, pulse counter, temperature sensor, output
- Scene extensions and value transmitter functions (temperature, brightness, RGBW colour values)
- Different telegrams for short/long button presses
- Short-circuit-proof, overload-protected and reverse polarity protected outputs

Logic functions:

- 8 separate logic functions (AND, OR, XOR, 1-bit to 1-byte, blocking element, comparator, limit value switch)
- Own KNX communication objects, processing of external KNX telegrams

Sensors:

- Integrated temperature and humidity sensor
- Dew point detection and alarm function

- Air quality measurement
- VOC sensor for calculating IAQ and eCO_2 values

KNX functions:

- KNX Data Secure capable
- Updateable by ETS service app
- Device certificate required for safe commissioning

7.1 Extensions

Channel configuration

- Channels can be activated and deactivated individually
- Adjacent, activated channels can be combined (e. g. E1 + E2)

Channel function "push-button"

i The "push-button" channel function is recommended if telegrams are to be transmitted on the KNX, depending on how long the channel/push-button was actuated. For example in the "dimming", "venetian blind", " value transmitter with value adjustment", "telegram upon short or long button actuation" functions or with the "RGB(W) colour adjustment".

i Available for a single channel and in the combined configuration.

i The combined configuration is recommended, for example, for 'dimming' or 'moving the venetian blind' with a connected series push-button. In this way, it is possible to use one button to dim or move up and the other button to dim or move down.

- The contact type can be set
- The function of the push-button can be set...

  Switching

  The command when pressing and/or releasing can be set (no reaction, switch on, switch off, toggle).

  Priority control

  The command when pressing and/or releasing can be set (no reaction; forcing active, switch on; forcing active, switch off; forcing inactive).

  Dimming and colour temperature

  The command when pressing the button, the time between switching and dimming, the dimming at different levels, the telegram repetition in the event of long actuation and the transmission of a stop telegram at the end of actuation can be set.

  Venetian blind / shutter / awning / roof window

  The command when pressing the button and the command sequence can be set.

Value transmitter

The data point type | value range and the value can be set. The value adjustment can optionally be activated by long button-actuation.

Scene extension unit

The scene number can be called up or switched over by briefly pressing the button. Optionally, the storage function is executed by pressing the button longer.

Short and long button operation

Up to two telegrams can be transmitted on the KNX by pressing the button. The transmission behaviour can be set and the time for short and long actuation adjusted. The function of the channels is adjustable separately.

Room temperature control point

The functionality (operating mode switch-over, forced operating mode switch-over, presence function and setpoint temperature shift) can be set.

- The behaviour after the bus voltage returns can be set
- The disabling function can be set

  The channel can be disabled by means of a 1-bit object. The following settings are possible: polarity of the disabling object, behaviour at the beginning and at the end of disabling. The channel is not functional during active disabling.

Channel function "Switch"

i The "switch" channel function is recommended if telegrams are to be transmitted cyclically on the KNX. This allows monitoring, similar to the heartbeat, to be implemented or rising and falling edges - like with the switch - to be evaluated regardless of the time.

i Available only for a single channel.

- The number of switch objects can be set

  Different switch functionalities can be parameterised for each object.
- The behaviour when closing the contact can be set
- The behaviour when opening the contact can be set
- The function of the switch can be set...
- Switching

  The command when closing and/or opening can be set (no reaction; switch on; switch off; toggle).
- Priority control

  The command when closing and/or opening can be set (no reaction; forcing active, switch on; forcing active, switch off; forcing inactive).
- Value transmitter

  The command when closing and/or opening can be set (no reaction, transmit value). The data point type | value range and the value can be set.
- Scene extension unit

The command when closing and/or opening can be set (call up scene, switch scenes). The scene number can be called up or switched over.

– Room temperature control point

  The command when closing and/or opening can be set according to the functionality. The functionality (operating mode switch-over, forced operating mode switch-over, presence function and setpoint temperature shift) can be set.

– The behaviour after the bus voltage returns can be set
– Cyclical transmission can be set
– The disabling function can be set

  The channel can be disabled by means of a 1-bit object. The following settings are possible: polarity of the disabling object, behaviour at the beginning and at the end of disabling. The channel is not functional during active disabling.

"Door/window status" channel function

ℹ The function can be implemented with magnetic contacts connected.

ℹ Available for a single channel and in the combined configuration.

– The door/window element to be evaluated can be set
– The door/window number can be assigned
– The evaluation can be adjusted individually
– The evaluation delay can be set
– The object polarity can be set
– The behaviour after the bus voltage returns can be set
– Cyclical transmission can be set
– The disabling function can be set

"Leakage/condensation sensor" channel function

ℹ The function can be implemented with connected leakage or condensation sensors.

ℹ Available only for a single channel.

– The object polarity can be set
– The behaviour after the bus voltage returns can be set
– Cyclical transmission can be set
– The disabling function can be set

"Temperature sensor" channel function

ℹ The function can be implemented with temperature sensors connected to channel 1 or 2.

ℹ Available only for a single channel.

– Temperature measurement by connected sensor possible

- The temperature measurement can be supplemented by an external value via the bus
- Measured values can be weighted
- Measured values can be calibrated
- The transmission behaviour can be set

"Pulse counter" channel function

i Available only for a single channel.

- The counting interval can be set
- Data point type | value range can be selected, e. g. 1 byte (DPT5.010 | 0..255), 2 bytes (DPT7.001 | 0..65535), 4 bytes (DPT13.001 | -2147483648..2147483647)
- Pulses can be counted in the event of a rising, falling or rising and falling edge
- The number of pulses required at the input per indicated counted pulse can be parameterised on the KNX
- The number of counted pulses required to change the meter reading can be parameterised
- Each channel has a main meter and intermediate meter
- The main and intermediate meters can be set separately as up or down meters
- The start and end values of the meters can be specified by parameters or communication objects
- The meter reading can be queried or transmitted automatically via the KNX
- The behaviour after the meter expires can be parameterised (e .g. for synchronisation with visualisation)
- The pulse meter can be reset via the KNX (meter reset)

Output

i An LED lamp can be connected.

i Available only for a single channel.

- Works in the switching function
- The object polarity can be set

7.2 Logic functions

- Up to 8 logic functions can be set
- Type of logic function can be set
- Logic gate...

  The logic gate can be selected

  Up to 4 inputs can be set

  The transmission criterion of the output can be set

- Converter...
  The reaction of the input can be set
  The object polarity of the disabling object can be set
  The output values for IN and OUT can be set
  The transmission criterion of the output can be set
- Time delay and filter element...
  The time function for the input of the disabling element can be set
  The object polarity of the disabling object can be set
  The filter function for the output of the disabling element can be set
  The transmission criterion of the output can be set
- Comparator...
  The data format for the input of the comparator can be set
  The reference function for the input of the comparator can be set
  The reference value for the input of the comparator can be set
  The transmission criterion of the output can be set
- Limit value switch with hysteresis...
  The data format for the input of the limit switch value can be set
  The lower threshold value for the input of the limit switch value can be set
  The upper threshold value for the input of the limit switch value can be set
  The transmission telegrams can be set according to the threshold value
  The transmission criterion of the output can be set

8 General settings

The "Information" parameter page provides information about topics "ETS compatibility" and "KNX Secure". No parameterisation is performed on this parameter page.

General settings of the device are configured and general functions enabled on the "General" parameter page.

8.1 Basic settings

General

The application area enables the use of recommended parameterisations for the current scenario, which can be individually adapted. Please note that all changes made in relation to this parameter setting will be lost when the application area is changed.

The following parameter settings are directly dependent on the parameterised application area:

– Show operating mode on the display
– Operating mode switchable at the touch of a button
– Main display
– Secondary display
– Indication of actual temperature

The "Application area" parameter is preset to "Private area (e.g. at home, holiday flat)". The following parameters are preset as follows for the private area:

– Show operating mode on the display = active
– Operating mode can be switched by touching a button = active
– Main display = target temperature
– Secondary display = actual temperature
– Actual temperature indicator = internal sensor

The "Application area" parameter can be changed to "Public area (e.g. office, hotel)". The following parameters are preset as follows for the public area:

– Show operating mode on the display = inactive
– Operating mode can be switched by touching a button = inactive
– Main display = target temperature
– Secondary display = no temperature

Enabled functions

The following functions can be enabled on the "General" parameter page:

– Temperature measurement
– Humidity measurement
– Determine dew point temperature

ℹ As the determination of the dew point requires the active measurement of temperature and humidity, the corresponding sensors are also activated.

– Air quality

  VOC measurement

  VOC (IAQ) measurement

  eCO2 measurement

– Operating lock
– On/off function
– Using extensions
– Heartbeat function
– Logic functions

ℹ These functions are configured on separate parameter pages.

Table of parameters

The following parameters are available on the "General" parameter page under the "General" heading.

Area of application	**Private area (e.g. at home, holiday flat)** Public area (e.g. office, hotel)
The application area enables the use of recommended parameterisations for the current scenario, which can be individually adapted. Please note that all changes made in relation to this parameter setting will be lost when the application area is changed. The following parameter settings are directly dependent on the parameterised application area: – Show operating mode on the display – Operating mode switchable at the touch of a button – Main display – Secondary display – Indication of actual temperature	

The following parameters are available under the heading "Enabled -> Sensor system" heading on the "General" parameter page.

Temperature measurement	**Active** Inactive
The temperature measurement of the device can be centrally enabled at this point. If "Active", the ETS shows further communication object and parameters.	

Humidity measurement	Active **Inactive**
The humidity measurement of the appliance can be enabled centrally at this point. If "Active", the ETS shows further communication object and parameters.	

Determine dew point temperature	Active **Inactive**
At this point, the determination of the dew point temperature can be enabled centrally by the device. If "Active", the ETS shows further communication object and parameters. i As the determination of the dew point requires the active measurement of temperature and humidity, the corresponding sensors are also activated.	

Air quality	Active **Inactive**
At this point, the air quality measurements are enabled centrally by the device. When "Active" is selected, the ETS displays the three possible measurements for enabling.	

VOC measurement	**Active** Inactive
The VOC measurement of the device can be centrally enabled at this point. If "Active", the ETS shows further communication object and parameters.	

VOC (IAQ) measurement	Active **Inactive**
The VOC (IAQ) measurement of the device can be centrally enabled at this point. If "Active", the ETS shows further communication object and parameters.	

eCO2 measurement	Active **Inactive**
The eCO2 measurement of the device can be centrally enabled at this point. If "Active", the ETS shows further communication object and parameters.	

The following parameters are available under the "Enabled functions -> Control functions" heading on the "General" parameter page.

Operating lock	Active **Inactive**
The operating lock of the device can be enabled centrally at this point. When "Active", the ETS displays further communication objects and other parameters on the "Display -> Display settings" parameter page.	

On/off function	Active **Inactive**
The on/off function of the device can be enabled centrally at this point. If "Active", the ETS shows further communication object and parameters on the "Controller extension" parameter page.	

The following parameter is available under the "Enabled functions -> Extension units" headings on the "General" parameter page.

Using extensions	Active **Inactive**
The extensions of the device are released centrally at this point. If "Active", the ETS shows further communication object and parameters.	

The following parameters are available under the "Enabled functions -> Additional functions" heading on the "General" parameter page.

Heartbeat function	Active **Inactive**
The heartbeat function of the device is enabled centrally at this point.	

Cycle time for transmission of device status	**0** ... 23 h | 0... **2** ... 59 min
This parameter defines the interval at which the condition of the device is transmitted to the bus. The cycle time can be configured between 1 minute and 23 hours and 59 minutes.	

Logic functions	Active **Inactive**
This parameter enables the logic functions globally. If the parameter is activated, the "Logic functions" parameter node becomes available, which contains additional parameter pages. The configuration of the logic functions takes place in this parameter node.	

Number of logic functions	**1** ... 8
The number of required logic functions is defined here.	

9 Sensor

The following subchapters provide a description of the device functions. Each subchapter consists of the following sections:

– Functional description
– Table of parameters
– Object list

Functional description

The functional description explains the function and provides helpful tips on project design and usage of the function. Cross references support you in your search for further information.

Table of parameters

The table of parameters lists all parameters associated with the function. Each parameter is documented in a table as follows.

Name of the parameter	Parameter values
Parameter description	

Object list

The object list specifies and describes all communication objects associated with the function. Each communication object is documented in a table.

Function	This column contains the function of the communication object.
Name	This column contains the name of the communication object.
Type	This column contains the length of the communication object.
DPT	This column assigns a datapoint type to a communication object. Datapoint types are standardized in order to ensure interoperability of KNX devices.
Flag	This column assigns the communication flags in accordance with the KNX specification.
C-Flag	activates / deactivates the communication of the communication object
R-Flag	enables externally triggered reading of the value from the communication object
W-Flag	enables externally triggered writing of the value to the communication object
T-Flag	enables transfer of a value
U-Flag	enables updating of an object value in case of feedback
I-Flag	enforces updating of the communication object value when the devices is switched on (reading at init)

9.1 Room temperature

Basic principles

The device has an integrated temperature sensor, which can be used to measure the room temperature.

A second external sensor connected via bus telegrams can be used to determine the actual value. This external sensor can also be combined with the temperature measurement by the internal sensor, for example in large rooms or halls.

Temperature measurement is activated on the "General" parameter page and configured on the "Sensors -> Room temperature" parameter page. The device offers a temperature measurement depending on the configuration of the "Temperature measurement by" parameter.

The following points should be considered when choosing the installation location for the device or the external sensors:

– The device or temperature sensor should not be integrated in multiple combinations, especially together with flush-mounted dimmers.
– Do not install the temperature sensor in the area of large electrical consumers (avoid heat influences).
– Installation in the vicinity of radiators or cooling systems is not advisable.
– The temperature sensor should not be exposed to direct sun.
– The installation of sensors on the inside of an outside wall might have a negative impact on the temperature measurement.
– Temperature sensors should be installed at least 30 cm away from doors, windows or ventilation devices and at least 1.5 m above the floor.

Temperature measurement and measured value determination

The device has an integrated temperature sensor. This temperature sensor can be used to measure the ambient temperature and forward it to a room temperature controller by means of the 2-byte object "Room temperature - Actual temperature - Status".

The room temperature measurement can optionally be supplemented with an external sensor. The external sensor is linked to the device (for example an additional push-button sensor or a KNX room temperature controller) via the bus by means of the additional 2-byte communication object "Room temperature - External value".

The "Temperature measurement by" parameter on the parameter page "Sensors -> Room temperature" specifies the sensors used to measure the room temperature. The following settings are possible:

– "Internal sensor"

  The temperature sensor integrated in the device is activated. Thus, the actual temperature value is determined only locally on the device.
– "Internal sensor and ext. value via bus"

In this setting the internal and external temperature sensor are active. The external sensor must either be a KNX room temperature controller coupled by means of the 2-byte object "Room temperature - External value" or another bus device with temperature detection.
When evaluating the internal and the external sensors, the real actual temperature is made up from the two measured temperature values. The weighting of the temperature values is defined by the parameter "Weighting of measured values". It is thus possible to calibrate the actual temperature measurement, depending on the different installation locations of the sensors or possibly uneven heat distribution inside the room. Often, those temperature sensors that are subject to negative external influences (for example, unfavourable location because of exposure to sun or heater or door / window directly next to it) are weighted less heavily.

Example:

The device has been installed next to the entrance door of the room (internal sensor). An additional external temperature sensor has been mounted on an inner wall in the middle of the room below the ceiling.
Internal sensor: 21.5 °C
External sensor: 22.3 °C
Determination of measured value: 30% to 70%

-> TResult internal = T internal · 0.3 = 6.45 °C,
-> TResult external = Texternal = 22.3 °C · 0.7 = 15.61 °C
-> TResult actual = TResult internal + TResult external = 22.06 °C

Transmission of the temperature

The determined temperature can be transmitted to the bus by means of the 2-byte object "Room temperature - Actual temperature - Status".

The parameter Send actual temperature "On change by" defines the temperature value by which the actual value of the temperature measurement must change so that the actual value is automatically sent via the "Room temperature - Actual temperature - Status" object. Possible temperature value changes lie within a range of 0.1 K and 25.5 K.

In addition, the temperature determined by the room temperature measurement can be transmitted cyclically. The "Cycle time" parameter defines the time rhythm (10 seconds to 24 hours).

i It is possible to read out the current actual values at any time via the bus by setting the "read" flag on the object "Room temperature - Actual temperature - Status".

i It has to be pointed out that with deactivated cyclical transmission and deactivated automatic transmission, no more temperature telegrams will be transmitted in case of changes.

Calibrating the measured values

In some cases during room temperature measurement, it may be necessary to adjust the single temperature values. Adjustment becomes necessary, for example, if the temperature measured by the sensors stays permanently below or above the actual temperature in the vicinity of the sensor. To determine the temperature deviation, the actual room temperature should be detected with a reference measurement using a calibrated temperature measuring device.

The "Temperature calibration" parameters can be used to configure the positive (temperature increase between 0.1 and 12.7 K) or negative (temperature decrease between –12.8 and –0.1 K) temperature calibration in 0.1 K increments. Thus, the calibration is only set statically once.

i The measured value has to be increased, if the value measured by the sensor lies below the actual room temperature. The measured value has to be decreased, if the value measured by the sensor lies above the actual room temperature.

i The calibrated temperature value is transmitted to the bus by means of the object "Room temperature - Actual temperature - Status".
When determining the measured value with combined sensors, the two adjusted values are used to calculate the actual value.

9.1.1 Table of parameters

"General" parameter page

Temperature measurement	**Active** Inactive
This parameter activates the temperature measurement. Additional parameters and objects become visible.	

Parameter page "Sensors -> Room temperature"

Temperature measurement by	**internal sensor** internal sensor and external value via bus
The "Temperature measurement by" parameter specifies the sensors used to measure the room temperature. "Internal sensor": The integrated temperature sensor is activated. Thus, the actual temperature value is determined only locally on the device. In this configuration, the feedback control will start directly after a device reset. "Internal sensor and ext. value via bus": The selected temperature sources are combined. The integrated temperature sensor is activated. The "Room temperature - External value" communication object is enabled. The actual temperature value is therefore determined locally on the device and with temperature values received via the bus.	

Weighting of the measured values	10% to 90% 20% to 80% 30% to 70% 40% to 60% **50% to 50%** 60% to 40% 70% to 30% 80% to 20% 90% to 10%
The weighting of the temperature values measured by the internal sensor and the external value is specified via the bus here. That results in an overall value, which will be used for the further interpretation of the room temperature.	

Sensor calibration	**Factory setting** Object with separately measured temperature value
Factory setting: The internal sensor works with the factory settings supplied and can be adjusted via a parameter. Object with separately measured temperature value: The internal sensor works after a sensor calibration via the communication object "Room temperature - Sensor calibration - Internal sensor" according to the sensor calibration. Temperature equalisation is then no longer necessary.	

Temperature calibration Internal sensor (0 = inactive)	-12.8...**0**...12.7
Determines the value in Kelvin by which the internal sensor’s measured value is adjusted.	

Temperature calibration External value via bus (0 = inactive)	-12.8...**0**...12.7
Determines the value in Kelvin by which the external value is calibrated via the bus.	

Transmit actual temperature	on change cyclical **On change and cyclical**
This parameter defines when the actual temperature is sent to the bus via the "Room temperature - Actual temperature - Status" communication object. Depending on the parameterisation carried out here, further parameters become visible.	

On change	0.1...**3**...25.5
Determines the extent the value of the room temperature is changed in Kelvin after which the current value is automatically transmitted to the bus by means of the object "Room temperature - Actual temperature - Status".	

Cycle time	0...**15**...255
This parameter defines the interval at which the determined actual temperature is transmitted to the bus. The cycle time can be parameterised between 10 seconds and 24 hours.	

Actual temperature without calibration	activated **deactivated**
This parameter determines whether the actual temperature is also sent to the bus without calibration. The actual temperature without calibration is sent to the bus via the "Room temperature - Actual temperature without calibration - Status" communication object. i If no temperature calibration has been parameterised, the communication objects "Room temperature - Actual temperature - Status" and "Room temperature - Actual temperature without calibration - Status" send the same values to the bus.	

Behaviour if sensor has not been calibrated	**Do not send temperature value** send invalid temperature value (0x7FFF)
After successful ETS commissioning, the device either sends no temperature values or an invalid temperature value (0x7FFF) to the bus if sensor calibration is parameterised via an object with a separately measured temperature value. The behaviour of the device is defined by this parameter.	

9.1.2 Object list

Function	Name	Type	DPT	Flag
Room temperature - Actual temperature - Status	Room temperature - output	2-byte	9,001	C, R, -, T, A
2-byte object for the output of the actual temperature determined by the device (room temperature). Possible value range: -99.9 °C to +99.9 °C / Measuring range of internal temperature sensor: -40 °C to +125 °C. The temperature value is always output in the format "°C".				

Function	Name	Type	DPT	Flag
Room temperature - Actual temperature without calibration - Status	Room temperature - output	2-byte	9,001	C, R, -, T, A
2-byte object for the output of the actual temperature determined by the device without calibration (room temperature). Possible value range: -99.9 °C to +99.9 °C / Measuring range of internal temperature sensor: -40 °C to +125 °C. The temperature value is always output in the format "°C".				

Function	Name	Type	DPT	Flag
Room temperature - Sensor calibration - Internal sensor	Room temperature - Input	2-byte	9,001	C, -, W, -, U
2-byte object for sensor calibration of the internal sensor. Possible range of values: -99.9 °C to +99.9 °C. The temperature value must always be specified in the format "°C".				

Function	Name	Type	DPT	Flag
Room temperature - External value	Room temperature - Input	2-byte	9,001	C, -, W, -, U
2-byte object for coupling an external KNX room temperature sensor or a controller extension. Thus cascading of multiple temperature sensors for room temperature measurement. Possible range of values: -99.9 °C to +99.9 °C. The temperature value must always be specified in the format "°C".				

9.2 Air humidity

The device has an integrated humidity sensor that can be used to record the humidity.

Humidity measurement is activated on the "General" parameter page and configured on the "Humidity" parameter page.

Transmitting the air humidity

The determined humidity can be sent to the bus via the 2-byte object "Humidity - actual value - status".

The parameter Send humidity "On change by" on the "Sensors -> Humidity" parameter page defines the humidity value by which the actual value of the humidity measurement must change so that the actual value is automatically sent via the "Humidity - Actual value - Status" object. Humidity value changes between 1% and 50% are possible.

In addition, the determined air humidity can be transmitted cyclically. The "Cycle time" parameter defines the time rhythm (10 seconds to 24 hours).

i By setting the "Read" flag on the "Humidity - Actual value - Status" object, it is possible to read out the current actual values via the bus at any time.

i It must be observed that no more air humidity telegrams will be transmitted in the event of changes if cyclical transmission is deactivated and automatic transmission switched off.

9.2.1 Table of parameters

"General" parameter page

Humidity measurement	Active **Inactive**
This parameter activates the humidity measurement. Additional parameters and objects become visible.	

Parameter page "Sensors -> Humidity"

Send air humidity	On change Cyclical **On change and cyclical**
This parameter defines when the humidity is sent to the bus via the "Humidity - actual value - status" communication object. Depending on the parameterisation carried out here, further parameters become visible.	

On change	0...**5**...50
Determines the extent the value of the room humidity is changed as a percentage after which the current value is automatically transmitted to the bus by means of the object "Air humidity - Actual value - Status".	

Cycle time	0...**15**...255
This parameter defines the interval at which the determined air humidity is transmitted to the bus. The cycle time can be parameterised between 10 seconds and 24 hours.	

9.2.2 Object list

The name of the following object can be specified by the parameter "Name of the room humidity measurement".

Function	Name	Type	DPT	Flag
Humidity - actual value - status	Air humidity -Output	2-byte	9,007	C, R, -, T, A
2-byte object for outputting the humidity determined by the device in per cent. The measured value "Humidity - actual value - status" is output without decimal places.				

9.3 Dew point

Basic principles

The device determines the dew point temperature from the measured actual temperature and humidity.

Determination of the dew point temperature is activated on the "General" parameter page and configured on the "Dew point" parameter page.

The dew point of water in the formal sense is the condensation point of pure water and thus a value pair from air humidity and room temperature. The temperature value of the dew point, i. e. the dew point temperature, is normally equated with the dew point. This concerns the temperature of the air with a specific humidity at which the condensation on an object is currently forming.

If the humid air is cooled below the dew point temperature, there is a phase change from gaseous to liquid and some of the water vapour contained in the air is released as excess moisture in liquid form as condensation.

Determine dew point temperature

The dew point temperature is calculated by the device on the basis of the determined room temperature and humidity values.

The determined humidity value of the sensor is adjusted by means of the Magnus formula which is an approximation formula for calculating the saturated vapour pressure depending on the temperature. It is very accurate (< 0.22 %) in the range between 0°C and 100°C and is primarily used in meteorology and building physics for determining the dew point.

i Humidity is measured using a sensor inside the appliance. The value may therefore deviate from the actual humidity in the room. This therefore also has an influence on the determined dew point temperature.

9.3.1 Table of parameters

"General" parameter page

Determine dew point temperature	Active **Inactive**
The device can determine the dew point temperature from the measured temperature and the measured humidity and forward this to other KNX devices (e.g. visualisations, room temperature controllers) via a 2-byte object. This parameter enables the dew point temperature to be determined. Additional parameters and objects become visible.	

Dew point" parameter page

Send dew point temperature	**On change** Cyclical On change and cyclical
The "Send dew point temperature" parameter specifies when the dew point temperature is sent automatically. "On change": The dew point temperature is sent if it has changed by a parameterised value. "Cyclical": The dew point temperature is sent at parameterised intervals. "On change and cyclically": Cyclical sending and sending on change work independently of each other. The cycle time is not restarted if a changed value has been sent to the bus.	

On change by	0.1 … **1** ... 5 K
This parameter defines the value by which the determined dew point temperature must change so that the dew point temperature value is automatically sent out via the object.	

Cycle time	**0** ... 24 h | 0 ... **15** ... 59 min | 0 ... 59 s
The determined dew point temperature can be emitted cyclically. This parameter specifies the cycle time (10 seconds to 24:00:00 hours).	

Send dew point alarm	Active **Inactive**
The device can activate and deactivate an alarm via the 1-bit object "Dew point temperature - Alarm" before the actual temperature reaches the dew point temperature. This parameter enables the sending of the alarm and activates further parameters for setting the temperature limits.	

Threshold for activation	0 ... 10 K > dew point temperature
This parameter defines the value in Kelvin by which the actual temperature must be above the "Dew point temperature" value before a dew point alarm is activated.	

Threshold for deactivation	1 ... 10 K > threshold for activation
This parameter defines the value in Kelvin by which the actual temperature must be above the "Threshold for activation" value before an active dew point alarm is deactivated again.	

9.3.2 Object list

Function	Name	Type	DPT	Flag
Dew point temperature - actual value - status	Dew point output	2-byte	9,001	C, R, -, T, A
2-byte object for outputting the determined dew point temperature. Possible range of values: -99.9 °C to +99.9 °C. The temperature value is always output in the format "°C".				

Function	Name	Type	DPT	Flag
Dew point temperature alarm	Dew point output	1-bit	1,005	C, R, -, T, A
1-bit object for activating and deactivating the dew point alarm.				

9.4 Air quality

The device offers three options for determining the air quality.

The integrated sensor can be used to measure volatile organic compounds (TVOC) and create an air quality index (IAQ) and determine the CO_2 content (eCO_2).

- VOC = Volatile Organic Compounds, in German: Flüchtige organische Verbindungen
- TVOC = Total Volatile Organic Compounds, in German: Gesamtgehalt flüchtiger organischer Verbindungen
- IAQ = Indoor Air Quality, in German: Innenraumluftqualität
- eCO_2 = Equivalent Carbon Dioxide, in German: Äquivalente CO_2-Konzentration

These measurements are typically used:

- in monitoring indoor air quality to ensure compliance with typical Federal Environment Agency (UBA) standards
- for monitoring indoor air quality in offices and living areas

These measurements can be used to carry out automation based on indoor air quality. For example, air purifiers, window openings or ventilation systems can be switched based on the air quality.

VOC measurement

The device measures the total volatile organic compounds in the air when VOC measurement is activated. The total volatile organic compounds are displayed on the bus as a TVOC value in µg/m³.

The TVOC value describes the total concentration of all measured VOCs in the air. VOCs are volatile organic compounds, chemicals that evaporate easily and are released into the air. A high TVOC value negatively affects the quality of indoor air and can be harmful to health. It can cause health problems such as headaches, fatigue or irritation of the eyes, nose or skin.

i Possible indoor sources are products and materials used in the construction of buildings and for interior decoration (e.g. floor, wall and ceiling materials, paints, varnishes, adhesives, furniture and decorative materials). Care, cleaning and hobby products, tobacco smoking, even food preparation and the human metabolism are also significant.

The following guide values are recommended for indoor areas.

TVOC (µg/m³)	Indoor air quality
500 to 800	Good
2500 to 3000	Medium
5000 to 6000	Moderate
9000 to 10000	Low

VOC (IAQ) measurement

The device measures the indoor air quality in relative values when VOC (IAQ) measurement is activated.

The IAQ value stands for "Indoor Air Quality". This is not a single chemical parameter as with VOCs, but a composite assessment of the air quality in an indoor space.

The IAQ value is an index or key figure that uses various measured parameters to assess how "good" or "bad" the air quality in a room is. The following factors, among others, can be included in the calculation:

– VOC content
– Temperature
– Air humidity

The device outputs the IAQ value to the bus as a numerical value. The higher the value, the worse the air quality.

The IAQ value is a practical overall indicator for assessing indoor air quality. The IAQ value helps to recognise whether room ventilation is necessary, for example.

The following table shows typical IAQ values and their evaluation

IAQ value	Indoor air quality
1.5 to 1.9	Good
2.9 to 3.3	Medium
3.9 to 4.3	Moderate
4.5 to 5	Low

eCO_2 measurement

The eCO_2 value stands for "equivalent carbon dioxide" - i. e. "equivalent CO_2 concentration".

The device uses a correlation algorithm between TVOC values and CO_2 values.

This makes it possible to establish a reliable link between the TVOC values and situations in which the CO_2 concentration increases due to human presence.

The range in which CO_2 is measured starts at 400 ppm (the normal value in the air) and goes up to 5000 ppm.

The following table shows typical eCO_2 values and their evaluation

eCO_2 value (ppm)	Indoor air quality
400 to 440	Good
420 to 460	Medium
580 to 620	Moderate
950 to 1050	Low

The air quality measurements are activated on the "General -> Basic settings" parameter page and configured on the "VOC measurement", "VOC (IAQ) measurement" and "eCO_2 measurement" parameter pages.

9.4.1 Table of parameters

"General -> Basic settings" parameter page

Air quality	activated **deactivated**
This parameter enables the parameters for the measurements to determine the air quality. The parameters "VOC measurement", "VOC (IAQ) measurement" and "eCO2 measurement" define which measurement is actually used for the determination.	

VOC measurement	**activated** deactivated
This parameter enables the measurements for determining the air quality feature VOC concentration. Additional parameters and objects become visible.	

VOC (IAQ) measurement	activated **deactivated**
This parameter enables the measurements for determining the air quality characteristic VOC (IAQ) concentration. Additional parameters and objects become visible.	

eCO2 measurement	activated **deactivated**
This parameter enables the measurements for determining the air quality feature eCO2 concentration. Additional parameters and objects become visible.	

9.4.2 VOC measurement

The determined VOC concentration can be sent to the bus via the 2-byte object "VOC concentration - actual value - status".

Sending the VOC concentration

The VOC concentration can be sent to the bus on change, cyclically or on change by cyclically.

In the event of a change, the VOC concentration is sent to the bus if the VOC concentration changes by a parametrisable value of 100 to 1000 in µg/m³.

The device can send the VOC concentration to the bus every 3 seconds to every 24 hours in a freely parametrisable cycle.

Transmission behaviour of alarms

The device can send up to four alarms to the bus for the measurement to determine the air quality VOC.

An alarm is sent to the bus via a 1-bit communication object

Each alarm message must be activated separately on the parameter page of the measurement.

Alarm 1	Good indoor air quality
Alarm 2	Average indoor air quality
Alarm 3	Moderate indoor air quality
Alarm 4	Low indoor air quality

Each alarm must be configured separately in the parameters in the ETS. Lower and upper threshold values can be parameterised with the desired behaviour.

The alarm can be triggered directly or after a parameterised transmission delay.

Sending the alarm

An alarm can be sent to the bus on change, cyclically or on change by cyclically.

The alarm is sent to the bus when the status of the alarm message changes.

The device can send the alarm to the bus every 1 minute to every 24 hours in a freely parametrisable cycle.

9.4.2.1 Table of parameters

Parameter page "Air quality -> VOC measurement"

Designation of the measurement	max. 40 characters long text
This parameter gives the VOC measurement a name for identification. This name serves merely as an aid in the ETS and is not programmed into the device.	

Send VOC concentration	**On change** Cyclical On change and cyclical
Here you can set whether the VOC concentration is sent to the bus when there is a change by a parameterised value or cyclically. The VOC concentration can also be sent when there is a change and cyclically.	

On change by	**100**...1000 µg/m³
Determines the size of the change in the value of the VOC concentration, after which the current value is automatically sent to the bus via the "VOC concentration - actual value - status" object.	

Cycle time	0...24 h | 0...**15**...59 min | 0...59 s
This parameter defines whether and at what time the determined VOC concentration is to be output cyclically via the "VOC concentration - actual value - status" object.	

Transmission behaviour VOC alarms

The following parameters are available four times for a total of up to four alarm messages via four communication objects via the bus.

The parameter designations, parameter values and parameter functions are described once below.

Alarm ...	activated **deactivated**
This parameter enables a communication object for the transmission behaviour of the first alarm.	

Name ...	max. 40 characters long text
This parameter gives the first alarm a name for identification. This name serves merely as an aid in the ETS and is not programmed into the device.	

Lower threshold value	100...**500**...10000 µg/m³

This parameter defines the lower threshold value separately for each alarm.

The following default values are preset for alarms 1 to 4:

- Alarm 1 = 500 µg/m³
- Alarm 2= 2500 µg/m³
- Alarm 3 = 5000 µg/m³
- Alarm 4 = 9000 µg/m³

Upper threshold value	100...**800**...10000 µg/m³

This parameter defines the upper threshold value separately for each alarm.

The following default values are preset for alarms 1 to 4:

- Alarm 1 = 800 µg/m³
- Alarm 2= 3000 µg/m³
- Alarm 3 = 6000 µg/m³
- Alarm 4 = 10000 µg/m³

Transmission delay	0...**1**...59 min | 0...59 s

This parameter defines the transmission delay separately for each alarm. With the "0" setting, values are sent to the bus without delay.

Behaviour when exceeding the upper threshold value	**Off** On No reaction

This parameter defines the behaviour when the upper threshold value is exceeded separately for each alarm.

Behaviour when falling below the lower threshold value	Off **On** No reaction

This parameter defines the behaviour when the value falls below the lower threshold separately for each alarm.

Send alarm *n*	On change Cyclical On change and cyclical

Here you can set separately for each alarm whether the alarm is sent to the bus every time there is a change or cyclically. The VOC concentration can also be sent when there is a change and cyclically.

Cycle time	0...24 h | 0...**10**...59 min

This parameter defines separately for each alarm the time at which the alarm is to be issued cyclically via the "VOC - Alarm *n*" object.

9.4.2.2 Object list

The name of the following object can be specified using the "Name of measurement" parameter on the "VOC measurement" parameter page.

Function	Name	Type	DPT	Flag
VOC concentration - actual value - status	VOC (...) - output	2-byte	9,030	C, R, -, T, A
2-byte object for outputting the VOC concentration determined by the push-button sensor in µg/m³.				

Function	Name	Type	DPT	Flag
VOC - Alarm 1	VOC (good indoor air quality) - output	1-bit	1,005	C, R, -, T, A
1-bit object to output the first alarm.				

Function	Name	Type	DPT	Flag
VOC - Alarm 2	VOC (average indoor air quality) - output	1-bit	1,005	C, R, -, T, A
1-bit object to output the second alarm.				

Function	Name	Type	DPT	Flag
VOC - Alarm 3	VOC (Moderate indoor air quality) - Output	1-bit	1,005	C, R, -, T, A
1-bit object to output the third alarm.				

Function	Name	Type	DPT	Flag
VOC - Alarm 4	VOC (low indoor air quality) - output	1-bit	1,005	C, R, -, T, A
1-bit object to output the fourth alarm.				

9.4.2.3 VOC - Air quality indication

For the VOC measurement, the air quality indication can be assigned as a function of one or more status LEDs of the respective rockers or buttons.

The assignment is made via the function of a status LED "Air quality indication" using the "Function" parameter on the "Status LED - Function" parameter page Basic functions.

The status LED indicates the air quality in the colours green (good), yellow (medium) and red (poor).

The limit values are parameterised on the "Air quality -> VOC measurement -> VOC - Air quality indication" parameter page.

i The colour of the status LED, which is configured on the "General -> Basic settings" parameter page, is not taken into account when the "Air quality indication" function is executed.

Quality areas

The VOC - Air quality indication function can display the overall air quality in a range from 0 to 10000 µg/m³.

Three quality areas can be defined in the ETS for

– Good air quality -> Status LED lights up in the colour green
– Medium good air quality -> Status LED lights up in the colour yellow
– Poor air quality -> Status LED lights up in the colour red

In addition to the quality ranges, a hysteresis can be defined in the ETS, whereby a change in the quality range is reported to the status LED with a delay in order to delay a change in the light colour of the status LED. This avoids frequent changes of light colour.

i The ETS displays a static infographic for the default settings of the quality areas. This graphic does not adapt dynamically to parameterisations.

9.4.2.3.1 Table of parameters

Parameter page "Air quality -> VOC measurement -> VOC - Air quality indication"

Quality areas

The lower and upper range limits for indicating the air quality via the status LED are parameterised in the Quality ranges table.

The device offers three quality ranges. The entire range is predefined from 0 to 10000 µg/m³. This means that the lower range limit for the "Good air quality" quality range and the upper range limit for the "Poor air quality" quality range are fixed.

The upper range limit for the "Good air quality" quality range and the lower range limit for the "Poor air quality" quality range are parameterised in the ETS.

The range limits for the "Average air quality" quality range are automatically determined by the parameterisation of the "Good air quality" and "Poor air quality" ranges and are entered by the ETS.

ℹ Ensure that the area boundaries do not overlap.

Good air quality (LED colour green)	**0** to 100...**1000**...5000 µg/m³
This parameter defines the quality range for the indication of good air quality with the LED colour green. The quality range always starts at 0.	

Average air quality (LED colour yellow)	100...**1000**...5000 to 2000...**4000**...9900 µg/m³
This parameter defines the quality range for the indication of medium air quality with the LED colour yellow. The quality range is automatically determined by the parameterisation of the "Good air quality" and "Poor air quality" ranges.	

Poor air quality (LED colour red)	2000....**4000**...9900 to **10000** µg/m³
This parameter defines the quality range for the indication of poor air quality with the LED colour red. The quality range always ends at 10000.	

Hysteresis	100...1000 µg/m³
This parameter defines the hysteresis, whereby a change in the quality range is signalled to the status LED with a delay in order to delay a change in the light colour of the status LED. This avoids frequent changes of light colour.	

9.4.3 VOC (IAQ) measurement

The determined VOC (IAQ) concentration can be sent to the bus via the 2-byte object "VOC (IAQ) concentration - actual value - status".

Sending the VOC (IAQ) concentration

The VOC (IAQ) concentration can be sent to the bus on change, cyclically or on change by cyclically.

On change, the VOC (IAQ) concentration is sent to the bus if the VOC (IAQ) concentration changes by a parametrisable value of 0.1 to 1.0.

The device can send the VOC (IAQ) concentration to the bus every 3 seconds to every 24 hours in a freely parametrisable cycle.

Transmission behaviour of alarms

The device can send up to four alarms to the bus for the measurement to determine the air quality VOC (IAQ).

An alarm is sent to the bus via a 1-bit communication object

Each alarm message must be activated separately on the parameter page of the measurement.

Alarm 1	Good indoor air quality
Alarm 2	Average indoor air quality
Alarm 3	Moderate indoor air quality
Alarm 4	Low indoor air quality

Each alarm must be configured separately in the parameters in the ETS. Lower and upper threshold values can be parameterised with the desired behaviour.

The alarm can be triggered directly or after a parameterised transmission delay.

Sending the alarm

An alarm can be sent to the bus on change, cyclically or on change by cyclically.

The alarm is sent to the bus when the status of the alarm message changes.

The device can send the alarm to the bus every 1 minute to every 24 hours in a freely parametrisable cycle.

9.4.3.1 Table of parameters

Parameter page "Air quality -> VOC (IAQ) measurement"

Designation of the measurement	max. 40 characters long text
This parameter gives the VOC (IAQ) measurement a name for identification. This name serves merely as an aid in the ETS and is not programmed into the device.	

Transmission behaviour VOC concentration

Send VOC (IAQ) concentration	On change Cyclical On change and cyclical
Here you can set whether the VOC (IAQ) concentration is sent to the bus when it changes by a parameterised value or cyclically. The VOC (IAQ) concentration can also be sent when there is a change and cyclically.	

On change by	0.1...**0.5**...1
Determines the size of the change in the value of the VOC (IAQ) concentration, after which the current value is automatically sent to the bus via the "VOC (IAQ) concentration - actual value - status" object.	

Cycle time	0...24 h | 0...**15**...59 min | 0...59 s
This parameter defines whether and at what time the determined VOC (IAQ) concentration is to be output cyclically via the "VOC (IAQ) concentration - actual value - status" object.	

Transmission behaviour VOC (IAQ) alarms

The following parameters are available four times for a total of up to four alarm messages via four communication objects via the bus.

The parameter designations, parameter values and parameter functions are described once below.

Alarm ...	activated **deactivated**
This parameter enables a communication object for the transmission behaviour of the first alarm.	

Name ...	max. 40 characters long text
This parameter gives the first alarm a name for identification. This name serves merely as an aid in the ETS and is not programmed into the device.	

Lower threshold value	1...**1.5**...5

This parameter defines the lower threshold value separately for each alarm.

The following default values are preset for alarms 1 to 4:

- Alarm 1 = 1.5
- Alarm 2= 2.9
- Alarm 3 = 3.9
- Alarm 4 = 4.5

Upper threshold value	1...**1.9**...5

This parameter defines the upper threshold value separately for each alarm.

The following default values are preset for alarms 1 to 4:

- Alarm 1 = 1.9
- Alarm 2= 3.3
- Alarm 3 = 4.3
- Alarm 4 = 5

Transmission delay	0...**1**...59 min | 0...59 s

This parameter defines the transmission delay separately for each alarm. With the "0" setting, values are sent to the bus without delay.

Behaviour when exceeding the upper threshold value	**Off** On No reaction

This parameter defines the behaviour when the upper threshold value is exceeded separately for each alarm.

Behaviour when falling below the lower threshold value	Off **On** No reaction

This parameter defines the behaviour when the value falls below the lower threshold separately for each alarm.

Send alarm *n*	On change Cyclical On change and cyclical

Here you can set separately for each alarm whether the alarm is sent to the bus every time there is a change or cyclically. The VOC (IAQ) concentration can also be sent when there is a change and cyclically.

Cycle time	0...24 h | 0...**10**...59 min

This parameter defines separately for each alarm the time at which the alarm is to be issued cyclically via the "VOC (IAQ) - Alarm *n*" object.

9.4.3.2 Object list

The name of the following object can be specified using the "Name of measurement" parameter on the "VOC (IAQ) measurement" parameter page.

Function	Name	Type	DPT	Flag
VOC (IAQ) concentration - actual value - status	VOC (IAQ) (...) - Output	2-byte	---	C, R, -, T, A
2-byte object for outputting the VOC (IAQ) concentration determined by the push-button sensor without a unit.				

Function	Name	Type	DPT	Flag
VOC (IAQ) - Alarm 1	VOC (IAQ) (Good Indoor Air Quality) - Output	1-bit	1,005	C, R, -, T, A
1-bit object to output the first alarm.				

Function	Name	Type	DPT	Flag
VOC (IAQ) - Alarm 2	VOC (IAQ) (Average Indoor Air Quality) - Output	1-bit	1,005	C, R, -, T, A
1-bit object to output the second alarm.				

Function	Name	Type	DPT	Flag
VOC (IAQ) - Alarm 3	VOC (IAQ) (Moderate Indoor Air Quality) - Output	1-bit	1,005	C, R, -, T, A
1-bit object to output the third alarm.				

Function	Name	Type	DPT	Flag
VOC (IAQ) - Alarm 4	VOC (IAQ) (Low Indoor Air Quality) - Output	1-bit	1,005	C, R, -, T, A
1-bit object to output the fourth alarm.				

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9.4.4 eCO2 measurement

The determined eCO2 concentration can be sent to the bus via the 2-byte object "eCO2 concentration - actual value - status".

Sending the eCO2 concentration

The eCO2 concentration can be sent to the bus on change, cyclically or on change by cyclically.

If there is a change, the eCO2 concentration is sent to the bus if the eCO2 concentration changes by a parametrisable value of 10 to 500 in ppm.

The device can send the eCO2 concentration to the bus every 3 seconds to every 24 hours in a freely parametrisable cycle.

Transmission behaviour of alarms

The device can send up to four alarms to the bus for the measurement to determine the air quality eCO2.

An alarm is sent to the bus via a 1-bit communication object

Each alarm message must be activated separately on the parameter page of the measurement.

Alarm 1	Good indoor air quality
Alarm 2	Average indoor air quality
Alarm 3	Moderate indoor air quality
Alarm 4	Low indoor air quality

Each alarm must be configured separately in the parameters in the ETS. Lower and upper threshold values can be parameterised with the desired behaviour.

The alarm can be triggered directly or after a parameterised transmission delay.

Sending the alarm

An alarm can be sent to the bus on change, cyclically or on change by cyclically.

The alarm is sent to the bus when the status of the alarm message changes.

The device can send the alarm to the bus every 1 minute to every 24 hours in a freely parametrisable cycle.

9.4.4.1 Table of parameters

Parameter page "Air quality -> eCO2 measurement"

Designation of the measurement	max. 40 characters long text
This parameter gives the eCO2 measurement a name for identification. This name serves merely as an aid in the ETS and is not programmed into the device.	

Transmission behaviour eCO2 concentration

send eCO2 concentration	On change Cyclical On change and cyclical
Here you can set whether the eCO2 concentration is sent to the bus when there is a change by a parameterised value or cyclically. The eCO2 concentration can also be sent when there is a change and cyclically.	

On change by	10...**50**...500 ppm
Determines the size of the change in the value of the eCO2 concentration, after which the current value is automatically sent to the bus via the "eCO2 concentration - actual value - status" object.	

Cycle time	0...24 h | 0...**15**...59 min | 0...59 s
This parameter defines whether and at what time the determined eCO2 concentration is to be output cyclically via the "eCO2 concentration - actual value - status" object.	

Transmission behaviour eCO2 alarms

The following parameters are available four times for a total of up to four alarm messages via four communication objects via the bus.

The parameter designations, parameter values and parameter functions are described once below.

Alarm ...	activated **deactivated**
This parameter enables a communication object for the transmission behaviour of the first alarm.	

Name ...	max. 40 characters long text
This parameter gives the first alarm a name for identification. This name serves merely as an aid in the ETS and is not programmed into the device.	

Lower threshold value	420...**420**...3000 ppm
This parameter defines the lower threshold value separately for each alarm. The following default values are preset for alarms 1 to 4: – Alarm 1 = 420 ppm – Alarm 2= 420 ppm – Alarm 3 = 580 ppm – Alarm 4 = 950 ppm	

Upper threshold value	420...**440**...3000 ppm
This parameter defines the upper threshold value separately for each alarm. The following default values are preset for alarms 1 to 4: – Alarm 1 = 440 ppm – Alarm 2= 440 ppm – Alarm 3 = 620 ppm – Alarm 4 = 1050 ppm	

Transmission delay	0...**1**...59 min | 0...59 s
This parameter defines the transmission delay separately for each alarm. With the "0" setting, values are sent to the bus without delay.	

Behaviour when exceeding the upper threshold value	**Off** On No reaction
This parameter defines the behaviour when the upper threshold value is exceeded separately for each alarm.	

Behaviour when falling below the lower threshold value	Off **On** No reaction
This parameter defines the behaviour when the value falls below the lower threshold separately for each alarm.	

Send alarm *n*	On change Cyclical On change and cyclical
Here you can set separately for each alarm whether the alarm is sent to the bus every time there is a change or cyclically. The eCO2 concentration can also be sent when there is a change and cyclically.	

Cycle time	0...24 h | 0...**10**...59 min
This parameter defines separately for each alarm the time at which the alarm is to be issued cyclically via the "eCO2 - Alarm *n*" object.	

9.4.4.2 Object list

The name of the following object can be specified using the "Name of measurement" parameter on the "eCO2 measurement" parameter page.

Function	Name	Type	DPT	Flag
eCO2 concentration - actual value - status	eCO2 (...) - output	2-byte	9,008	C, R, -, T, A
2-byte object for outputting the eCO2 concentration determined by the push-button sensor in ppm.				

Function	Name	Type	DPT	Flag
eCO2 - Alarm 1	eCO2 (Good indoor air quality) - Output	1-bit	1,005	C, R, -, T, A
1-bit object to output the first alarm.				

Function	Name	Type	DPT	Flag
eCO2 - Alarm 2	eCO2 (Average indoor air quality) - Output	1-bit	1,005	C, R, -, T, A
1-bit object to output the second alarm.				

Function	Name	Type	DPT	Flag
eCO2 - Alarm 3	eCO2 (Moderate indoor air quality) - Output	1-bit	1,005	C, R, -, T, A
1-bit object to output the third alarm.				

Function	Name	Type	DPT	Flag
eCO2 - Alarm 4	eCO2 (low indoor air quality) - output	1-bit	1,005	C, R, -, T, A
1-bit object to output the fourth alarm.				

10 Operating functions

10.1 Operating lock

The device has a separately configurable operating lock. The operating lock can be activated on the "General" parameter page under "Operating functions".

When the operating lock is activated, the ETS enables further parameters for configuring the operating lock under "Automatic operating lock" on the "Display -> Display settings" parameter page.

An operating lock on the operating element can be activated and used as a child safety lock or to prevent operating errors. The operating lock for the device can be switched on and off during operation.

The active operating lock is signalled by the lock symbol Icons of the operating element. If the operating element of the appliance is touched when the operating lock is switched on, the lock symbol flashes. This shows that the device is locked. At the same time, the display brightness changes to the value "During operation" for 20 seconds.

i If the operating lock is switched on and humidity is measured at the same time, only the lock symbol is shown on the display. The drop symbol is not displayed.

Switching on the operating lock

Operation of the operating element can be disabled by pressing and holding the "v" and "+" control buttons simultaneously (> 1 second).

i When the operating lock is switched on, all other operations on the operating element are ignored.

Automatic operating lock

The operating lock can switch on automatically after a certain period of inactivity. This time can be set from 10 seconds to 59 minutes and 59 seconds.

Operating lock via object

The operating lock can be switched on and off via the communication object.

Switching off the operating lock

The operating element can be unlocked by pressing and holding the "v" and "+" control buttons simultaneously (> 1 second).

Behaviour after an ETS programming operation or after the bus voltage returns

The operating lock can be active or inactive after an ETS programming operation or after bus voltage return. The operating lock can also assume the state before the ETS programming process or before the bus voltage failure.

10.1.1 Table of parameters

"General" parameter page

Operating lock	Active **Inactive**
The operating lock blocks operation of the appliance via the operating element. An operating lock on the operating element can be activated and used as a child safety lock or to prevent operating errors. This parameter activates the operating lock for the device and can be switched on and off during operation. When the operating lock is activated, the ETS enables further parameters for configuring the operating lock under "Automatic operating lock" on the "Display -> Display settings" parameter page. Additional parameters and objects become visible.	

Parameter page "Display -> Display settings"

Automatic operating lock	**Active** Inactive
The operating lock can switch on automatically after a certain period of inactivity. This parameter activates the automatic operating lock.	

Automatic operating lock after	0 ... 59 min | 0 ... **20** ... 59 s
The automatic operating lock switches on after a certain period of inactivity. This time can be set from 10 seconds to 59 minutes and 59 seconds.	

Operating lock via object	Active **Inactive**
The operating lock can be switched on and off via the communication object. This parameter enables the "Operating lock - Default" communication object.	

After an ETS programming operation or after the bus voltage returns	Behaviour as before Operating lock active **Operating lock inactive**
The operating lock can be active or inactive after an ETS programming operation or after bus voltage return. The operating lock can also assume the state before the ETS programming process or before the bus voltage failure.	

10.1.2 Object list

Function	Name	Type	DPT	Flag
Operating lock - Status	Display - Output	1-bit	1,003	C, R, -, T, A
1-bit object for outputting the current status of the operating lock (0 = operating lock switched off / 1 = operating lock switched on).				

Function	Name	Type	DPT	Flag
Operating lock - default	Display - Input	1-bit	1,003	C, -, W, T, U
1-bit object for switching the operating lock on and off via object (0 = switch off operating lock / 1 = switch on operating lock).				

10.2 On/off function

The device has a separately configurable on/off function. The switch-on/switch-off function can be activated on the "General" parameter page under "Operating functions".

When the switch-on/switch-off function is activated, the ETS enables further parameters for configuring the switch-on/switch-off function on the "Controller extension" parameter page.

i The device can also be switched on or off with a long press (> 4 seconds) on the centre buttons when the on/off function is inactive.

The switch-on/switch-off function can optionally be used to send value telegrams to the bus when the device is switched on or off. 1-bit values, 1-byte values or scene numbers can be sent to the bus.

When the device is switched off, the current actual temperature can optionally be shown in the main segment of the display.

The secondary display shows "OFF" when the device is switched off.

Depending on the application, the value telegrams can be sent to the bus only when switching off, only when switching on or when switching on and off.

i If the product is in the "Off" state and a lock is activated by object, this is tracked in the background.

i If the device is switched to the "Off" state, the "Automatic operating lock according to time setting" is updated in the background with the corresponding time.

i If the product is set to "Off" mode, the display brightness changes to the brightness value in idle mode after 20 seconds.

10.2.1 Table of parameters

"General" parameter page

On/off function	Active **Inactive**
The switch-on/switch-off function can optionally be used to send value telegrams to the bus when the device is switched on or off. 1-bit values, 1-byte values or scene numbers can be sent to the bus This parameter is used to activate the on/off function for the device. When the switch-on/switch-off function is activated, the ETS enables further parameters for configuring the switch-on/switch-off function on the "Controller extension" parameter page. i The device can also be switched on or off with a long press (> 4 seconds) on the centre buttons when the on/off function is inactive. Additional parameters and objects become visible.	

Parameter page "Controller extension"

Indicator of actual temperature in the main segment after switching off	Active **Inactive**
When the device is switched off, the current actual temperature can optionally be shown in the main segment of the display. This parameter activates or deactivates this indicator when switched off.	

When switching off the display	**Switchover to frost/heat protection** maintain current operating mode
This parameter defines the switchover behaviour of the operating mode when the display is switched off. It can be switched to frost/heat protection when switched off or the current operating mode can be retained.	

Function	**No reaction** send 1-bit object send 1-byte object Activate scene
This parameter defines the function of the switch-on/switch-off function when the switch-on/switch-off function is activated. no reaction: The device does not send any value telegrams to the bus when it is switched on or off. send 1-bit object: The device sends 1-bit value telegrams to the bus when it is switched on or off. send 1-byte object: The device sends 1-byte value telegrams to the bus when it is switched on or off. Activate scene: the device sends scene number telegrams to the bus when it is switched on or off.	

Send to	Switch off Switch on **Switching the device on or off**
This parameter defines for the on/off function whether value telegrams are only sent to the bus when switching off, only when switching on or when switching on and off.	

When switching off	**Off** On
This parameter defines the 1-bit value that is sent to the bus when switching off (0 = Off / 1 = On).	

When switching on	**Off** On
This parameter defines the 1-bit value that is sent to the bus when switching on (0 = Off / 1 = On).	

When switching off	**0**...255
This parameter defines the 1-byte value that is sent to the bus when switching off.	

When switching on	0...**255**
This parameter defines the 1-byte value that is sent to the bus when switching on.	

When switching off	**1**...64
This parameter defines the scene number that is sent to the bus when switching off.	

When switching on	1...**2**...64
This parameter defines the scene number that is sent to the bus when switching on.	

10.2.2 Object list

Function	Name	Type	DPT	Flag
On/off function	Display - Output	1-bit	1,001	C, R, -, T, A
1-bit object for outputting the 1-bit value telegram of the switch-on/switch-off function (0 = Off / 1 = On) to the bus.				

Function	Name	Type	DPT	Flag
On/off function Status	Display - Input	1-bit	1,001	C, -, W, T, U
1-bit object for receiving the 1-bit value status of the switch-on/switch-off function (0 = Off / 1 = On) via the bus.				

Function	Name	Type	DPT	Flag
On/off function	Display - Output	1-byte	5,001	C, R, -, T, A
1-byte object for outputting the 1-byte value telegram of the switch-on/switch-off function (0...255) to the bus.				

Function	Name	Type	DPT	Flag
On/off function	Display - Output	1-byte	17,001	C, R, -, T, A
1-byte object for outputting the scene number telegram of the switch-on/switch-off function (1...64) to the bus.				

11 Controller extension

Introduction

The device can be used for extension unit operation, allowing central heating control devices with an integrated room temperature controller to be controlled.

In this configuration, the device itself is not involved in temperature control.

Room temperature controllers typically allow the room temperature control to be influenced in different ways. These include the operating mode switchover and setpoint temperature shift options.

In extension unit mode, the device is operated via the control panels (see chapter "Device components" ▸ Page 9).

The operating elements can be used to control a room temperature controller by changing the operating mode and adjusting the setpoint temperature.

11.1 Setpoint temperature

In extension unit mode, the device offers the option of specifying a setpoint value for the setpoint temperature.

The setpoint can be specified either via an absolute temperature value specification or via a relative temperature value shift.

Operation

With the setpoint temperature shift, the setpoint value is specified using the "-" and "+" buttons. If the "+" or "-" button is pressed and held (>1 s), the setpoint is set with 3 increments per second.

If the setpoint is not adjusted again within 3 seconds of the last operation or if the menu button is pressed, the changed setpoint temperature is sent to the controller via the bus.

Status feedback

As soon as the change is confirmed to the device via the status object, the confirmation of the setpoint change is confirmed by a double flashing setpoint temperature in the display. If a different setpoint temperature is reported back via the status object, this different setpoint temperature is adopted in the device and confirmed with a double flash in the display.

If the setpoint temperature is adjusted on the device in such a way that there is no change in the setpoint specification, confirmation of the setpoint setting is confirmed by a double flashing setpoint temperature in the display, but is not sent to the bus. This means that there is no change in the setpoint temperature at the start of operation.

After specifying a setpoint using the "-" and "+" buttons and sending the new setpoint temperature to the bus, the device expects feedback via the status setpoint object. If this feedback does not occur automatically within 10 seconds, the device sends a read request for the setpoint temperature to the bus. If there is again no response after 10 seconds, the display shows an error "--" in the secondary segment instead of the setpoint temperature.

In the event of an error, each time the "-" and "+" buttons are pressed again, the device sends the last setpoint temperature sent, but not yet confirmed, to the bus. Only after the setpoint temperature has been confirmed can it be adjusted again using the "-" and "+" buttons.

In the event that a new setpoint temperature is received without prior operation of the "-" and "+" buttons on the device, this new setpoint temperature is shown in the secondary segment of the display. For example, the desired temperature can change when the operating mode is changed.

Absolute temperature value specification

With absolute temperature value specification, the setpoint is specified using the "-" and "+" buttons in fixed increments of 1 °C. If the "+" or "-" button is pressed and held (>1 s), the setpoint is set with 3 increments per second (= 3 °C).

i The secondary segment of the display shows setpoint temperatures in 0.5 °C increments. In the case of setpoint specifications via the bus, the displayed setpoint temperature is rounded if changes to the setpoint temperature are made elsewhere in 0.1 °C increments.

Relative temperature value shift

With the relative temperature value shift, the shift takes place according to the parameterisation via count value x step value or via relative temperature values.

The device supports the setpoint shift via count value function (count value x step value). The communication objects for the temperature shift are then of data point type 6.010.
When a temperature difference is received, the device always calculates from the "Setpoint temperature - active operating mode". If the "Setpoint temperature - active operating mode" is 21 °C, for example, a value of "-2" is sent to the bus via the communication object when the "-" button is pressed twice. This results in a setpoint temperature of 19 °C. Accordingly, the indicator shows the setpoint values of 20 °C -> 19 °C during operation.

The device supports the setpoint shift function using temperature differences (relative temperature values). The communication objects for the temperature shift are then of data point type 9.002.
When a temperature difference is received, the device always calculates from the "Setpoint temperature - active operating mode". If the "Setpoint temperature - active operating mode" is 21 °C, for example, a value of "-2 K" is sent to the bus via the communication object when the "-" button is pressed twice. This results in a setpoint temperature of 19 °C. Accordingly, the indicator shows the setpoint values of 20 °C -> 19 °C during operation.

The increment results from the operation.

The correct setpoint temperature of the active operating mode is required for the relative temperature value shift function. This must be transmitted to the device via the "Setpoint temperature - Active operating mode" communication object when changing operating mode, among other things.

11.2 Operating mode switchover

The device can switch between different operating modes at the touch of a button or via the bus.

Different operating modes are switched, each of which is assigned different setpoint temperatures and properties in the controller.

The following table shows the available operating modes.

DPT 20.102
Comfort
Standby
Night

The ETS provides suitable communication objects and parameters.

The prerequisite for the device to be able to switch between different operating modes is that the "Show operating mode on display" parameter is parameterised as active and the active operating mode is therefore shown on the display.

Operating mode switchover by pressing a button

The current operating modes are shown on the display. These operating modes can be switched using the menu button. If an operating mode is selected, the device sends the change to the bus three seconds after switching via the menu button.

Switching via the menu button takes place according to the parameterised switching behaviour.

Operating mode switchover by means of object

The operating mode to be set is specified via the central 1-byte communication object.

11.3 Controller extension parameters

Parameter page "Controller extension"

Setpoint presetting	**absolute temperature value specification** relative temperature value shift
It is possible to configure the setpoints directly (absolute setpoint presetting) or relatively (derivation from basic setpoint). This parameter defines the way the setpoint temperature is preset. With "relative", all temperature setpoints are derived from the basic temperature (basic setpoint). With "Absolute": The setpoint temperatures are independent of each other. Different temperature values can be specified for each operating mode and heating/cooling mode.	

Type of shift	Counting value x increment **relative temperature value**
Depending on the setting of the parameter "Type of shift", the shift takes place via a 2-byte communication object according to KNX DPT 9.002 or via a 1-byte communication object according to KNX DPT 6.010.	

Show operating mode on the display	**Active** Inactive
This parameter enables the active operating mode to be shown on the indicator. This parameter enables the communication objects for switching the operating mode. When active: The device can switch the operating mode via communication objects and shows the currently active operating mode on the display. When inactive: The operating mode switchover by the device is deactivated. The device does not show the currently active operating mode on the display.	

Operating mode switchable at the touch of a button	**Active** Inactive
This parameter enables the operating mode to be switched on the device. When active: The operating modes can be switched using the menu button. If an operating mode is selected, the device sends the change to the bus three seconds after switching via the menu button. When inactive: The operating modes cannot be switched using the menu button.	

Switch-over behaviour	**Comfort / Standby / Night** Comfort/Standby Comfort/Night Standby/Night
This parameter changes the behaviour of the operating modes via the menu button. The device switches through the operating modes in sequence according to the selected values.	

Temporarily store setpoints with delayed feedback signals	Active **Inactive**
This parameter decides whether setpoints are temporarily stored in the device in the event of delayed feedback.	

Extended parameters	Active **Inactive**
This parameter enables extended configuration options for the operating mode switchover function. If the extended parameters are deactivated, the display does not show any additional symbols. When the advanced parameters are activated, the ETS shows the following parameters.	

Additionally display eco symbol in standby/night mode	Active **Inactive**
An additional eco symbol is shown on the display during operation if the controller is operating in standby or night operating mode.	

Heating/cooling process indicated by symbol	Active **Inactive**
An additional symbol is shown on the display during operation if the controller is actively heating or cooling.	

Enable boost function	Active **Inactive**
This parameter enables the boost function.	

11.4 Controller extension objects

Function	Name	Type	DPT	Flag
Setpoint temperature - Active operating mode	Display - Input	2-byte	9,001	C, -, W, T, U
2-byte object for external specification of the basic setpoint temperature. The controller rounds the temperature values received via the object to 0.1 K. The temperature value must always be specified in the format "°C".				

Function	Name	Type	DPT	Flag
Setpoint temperature specification	Display - Output	2-byte	9,001	C, R, -, T, A
2-byte object for specification of the setpoint temperature. The temperature value is specified in the format "°C".				

Function	Name	Type	DPT	Flag
Setpoint temperature - Shift	Display - Output	2-byte	9,002	C, R, -, T, A
2-byte object for presetting a basic setpoint shift. The value of a counter value in the communication object is 0.5 Kelvin. The value "0" means that no shift is active . The value is depicted in a double complement in the positive and negative direction.				

Function	Name	Type	DPT	Flag
Setpoint temperature - Shift status	Display - Input	2-byte	9,002	C, -, W, T, U
2-byte object used to feed back the current basic setpoint shift from the main controller. The value "0" means that no shift is active . The value is depicted in a double complement in the positive and negative direction.				

Function	Name	Type	DPT	Flag
Setpoint temperature shift	Display - Output	1-byte	6,010	C, R, -, T, A
1-byte object for presetting a basic setpoint shift. The value of a counter value in the communication object is 0.5 Kelvin. The value "0" means that no shift is active . The value is depicted in a double complement in the positive and negative direction.				

Function	Name	Type	DPT	Flag
Setpoint temperature shift status	Display - Input	1-byte	6,010	C, -, W, T, U
1-byte object used to feed back the current basic setpoint shift from the main controller. The value of a counter value in the communication object is 0.5 Kelvin. The value "0" means that no shift is active . The value is depicted in a double complement in the positive and negative direction.				

Function	Name	Type	DPT	Flag
Boost - Activate / Deactivate	Display - Output	1-bit	1,010	C, R, -, T, A
1-bit output object for requirement-orientated activation and deactivation of the boost function. The telegram polarity is fixed: "0" = boost inactive, "1" = boost active.				

Function	Name	Type	DPT	Flag
Boost - Status	Display - Input	1-bit	1,011	C, -, W, T, U
1-bit object via which the controller main unit outputs the current status of the boost function to the device. When the boost function is activated, the status object is set to the value "1". When the boost function is deactivated, the status object is set to the value "0".				

Function	Name	Type	DPT	Flag
Heating status indication	Display - Input	1-bit	1,001	C, -, W, T, U
A main controller can usually signal via a separate object whether the controller is currently requesting heating energy and is therefore actively heating. The device can receive the message for active heating from the controller main unit via this object. The device shows the heating symbol on the display as soon as heating is active.				

Function	Name	Type	DPT	Flag
Cooling status indication	Display - Input	1-bit	1,001	C, -, W, T, U
A main controller can usually signal via a separate object whether the controller is currently requesting cooling energy and is therefore actively cooling. The device can receive the message for active cooling from the controller main unit via this object. The device shows the cooling symbol on the display as soon as cooling is active.				

12 Display

The device has a display (see chapter "Front view" Page 9).

The display contains various segments that can be used to show different information (see chapter "Icons in the display" Page 12).

The brightness of the display is adjustable

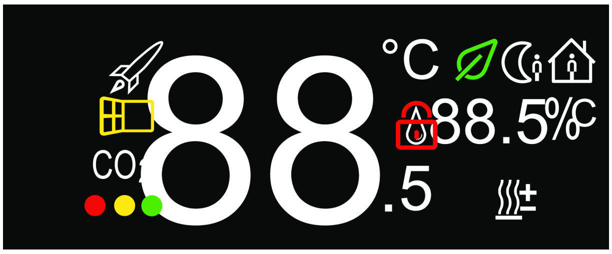


Figure 15: Icons in the display

12.1 Display indicators

Operating mode indication

The device can show the currently active operating mode in the top right-hand display if this indication is activated in the ETS on the "Controller extension" parameter page.

The following operating modes can be shown on the display:

Comfort operating mode is active

Reduction temperature operating mode is active

Night setback operating mode is active

Eco operating mode is active

Main display and secondary display

The display is divided into a main display and a secondary display, corresponding to the red frames.

Figure 16: Main display of the display

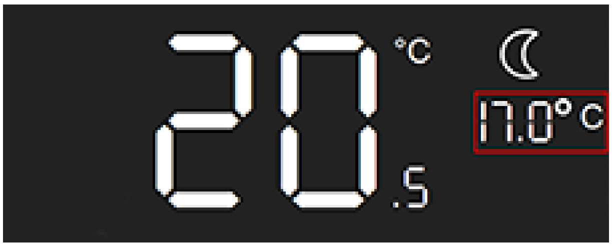


Figure 17: Secondary display of the display

The main display can show the actual temperature or the set temperature in large letters in the centre of the display.

If the main display shows the current actual temperature according to the parameterisation, the secondary display simultaneously shows the set target temperature.

If the main display shows the setpoint temperature, you can set in the ETS whether the secondary display shows the actual temperature in small form in the right-hand display area or whether no temperature is shown at this point in the display.

i The temperature is displayed in the secondary segment in 0.5 °C increments. The display shows rounding values when the temperature is changed via the bus in 0.1 °C increments.

Humidity display

A humidity value in per cent can be shown in the secondary display if this indicator is activated in the ETS on the "Display -> Display settings" parameter page. In this case, a drop symbol in the main display indicates that the secondary display is showing the humidity value.


Air humidity

i The humidity value is shown in the secondary display in automatic alternation with the actual or target temperature for 5 seconds if the secondary display is to show one of these temperatures.

i When the operating lock is active, the drop symbol of the humidity display is not shown in the main display because the lock symbol is shown with higher priority.

i If the display is inactive and the display is activated for the first time using the menu button, this has no effect on the alternating display of temperature and humidity values.

i If the operating modes are changed using the menu button, the change to the humidity display is suspended during operation and then for 10 seconds in the secondary display.

i If the setpoint temperature is shown and changed in the secondary display, the change to the humidity display is suspended during operation and then for 10 seconds in the secondary display.

Air quality display

The air quality status can be shown in the lower left-hand area of the display if this indicator is activated in the ETS on the "Display -> Display settings" parameter page. In this case, a$_{\text{CO2 traffic light}}$ shows the air quality in three colours.

VOC limit values and a hysteresis can be set in the ETS for the air quality status traffic light.

Air quality status (VOC, VOC (IAQ), eCO2); (only for "Comfort" variant)

Green = good

Yellow = medium

Red = bad

Indication in switched-off state

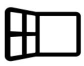
The secondary display shows "OFF" when the device is switched off.

In the ETS, parameters can be used to select whether the actual temperature should also be displayed in the main segment (see chapter "On/off function" Page 79).

Figure 18: Display in switched-off state

Window status display

The device can show an open window in the centre-left display area if this indicator is activated in the ETS on the "Display -> Display settings" parameter page. By activating the "Show warning message" parameter under Window status when window is open, the ETS offers the "Window contact - default" communication object, which can be used to show or hide the "open window" symbol in the display.



Window status (open window was recognised)

In addition, operation can be blocked on the device when the window is open. If a window is signalled as open, operation of the control surfaces of the appliance is blocked. Any operations are not analysed and processed. The device signals that operation is blocked when the window is open by flashing the window symbol. At the same time, the display brightness changes to the value "During operation" for 20 seconds.

Show operating lock

The device can show a lock symbol in the main display if the operating lock is activated in the ETS on the "General" parameter page and the operating lock is active. When the operating lock is activated, the device shows the lock symbol in the main display when locked (see chapter "Operating lock" ▸ Page 76).

Operating lock is activated

If the operating element of the appliance is touched when the operating lock is switched on, the lock symbol flashes. This shows that the device is locked. At the same time, the display brightness changes to the value "During operation" for 20 seconds.

When the operating lock is active, the drop symbol of the humidity display is not shown in the main display because the lock symbol is shown with higher priority.

Display boost function

While the boost function is switched on, the display shows a rocket symbol in the top left-hand display area (see chapter "Controller extension" ▸ Page 83).

The boost function is active

Indicating heating and cooling

For the "Heating" or "Cooling" duration, the display shows the corresponding symbol in the bottom right-hand display area (see chapter "Controller extension" ▸ Page 83).

Heating/cooling

12.1.1 Table of parameters

Parameter page "Display -> Display settings"

<table>
<tr><td>Main display</td><td>Actual-temperature
Setpoint temperature</td></tr>
<tr><td colspan="2">This parameter defines which temperature value is shown on the main display.
The setting of this parameter influences the parameterisability of the "Secondary display" parameter.
For "Actual temperature": The main display shows the actual temperature. The secondary indication of the display indicates the setpoint temperature.
For "Set temperature": The main display shows the set temperature. The secondary display can be parameterised.</td></tr>
</table>

<table>
<tr><td>Secondary display</td><td>Actual-temperature
no temperature</td></tr>
<tr><td colspan="2">This parameter defines whether the actual temperature is shown on the secondary display or whether the secondary display does not show any temperature.
The availability of this parameter depends on the parameterisation of the "Main display" parameter.
For "Actual temperature": The secondary display shows the actual temperature.
With "no temperature": The secondary display does not show any temperature.
i The temperature is displayed in the secondary segment in 0.5 °C increments. The display shows rounding values when the temperature is changed via the bus in 0.1 °C increments.</td></tr>
</table>

<table>
<tr><td>Indication of actual temperature</td><td>internal sensor
external value via bus</td></tr>
<tr><td colspan="2">The source for displaying the actual temperature can either be the internal sensor in the device or an external value received via the bus.
i For the display of the actual temperature from the internal sensor to work, the temperature measurement of the device must first be activated and parameterised.
With "internal sensor": The display shows the actual temperature of the device's internal temperature measurement, including weighting of the measured values if necessary. The value corresponds to the value of the "Room temperature - Actual temperature - Status" communication object.
With "external value via bus": The display shows the temperature value "Actual temperature display (external sensor)" received via the communication object.</td></tr>
</table>

<table>
<tr><td>Display humidity value (%)</td><td>Active
Inactive</td></tr>
<tr><td colspan="2">The display will show a humidity value in per cent in the secondary display if this indicator is activated. In this case, a drop symbol in the main display indicates that the secondary display is showing the humidity value.</td></tr>
</table>

<table>
<tr><td>Display humidity value from</td><td>**internal sensor**
external value via bus
internal sensor and external value via bus</td></tr>
<tr><td colspan="2">The source for displaying the humidity value can either be the internal sensor in the device or an external value received via the bus, or a combination of both values.

i For the display of the humidity value from the internal sensor to work, the humidity measurement of the device must first be activated and parameterised.

With "internal sensor": The display shows the humidity value of the appliance's internal humidity measurement. The value corresponds to the value of the "Humidity - Actual value - Status" communication object.

With "external value via bus": The display shows the humidity value "External humidity (external sensor)" received via the communication object.

With "internal sensor and ext. value via bus": The display shows a calculated humidity value resulting from the humidity value measured internally by the device and the humidity value received via the communication object, including the parameterised weighting of the measured values.</td></tr>
</table>

<table>
<tr><td>Weighting of the measured values</td><td>10% to 90%
20% to 80%
30% to 70%
40% to 60%
50% to 50%
60% to 40%
70% to 30%
80% to 20%
90% to 10%</td></tr>
<tr><td colspan="2">At this point, the weighting of the humidity measurement values of the internal sensor and the external value via the bus is defined. This results in an overall value, which is used for further evaluation of the air humidity.</td></tr>
</table>

<table>
<tr><td>Display air quality status</td><td>**Active**
Inactive</td></tr>
<tr><td colspan="2">The air quality status can be shown in the lower left area of the display if this indicator is activated. In this case, $a_{\text{CO2 traffic light}}$ shows the air quality in three colours.</td></tr>
</table>

The lower and upper range limits for indicating the air quality are configured in the table.

The device offers three quality ranges. The entire range is predefined from 0 to 10000 µg/m³. This means that the lower range limit for the "Good air quality" quality range and the upper range limit for the "Poor air quality" quality range are fixed.

The upper range limit for the "Good air quality" quality range and the lower range limit for the "Poor air quality" quality range are parameterised in the ETS.

The range limits for the "Average air quality" quality range are automatically determined by the configuration of the "Good air quality" and "Poor air quality" ranges and are entered by the ETS.

i Ensure that the area boundaries do not overlap.

Good air quality (green)	**0** to 100...**1000**...5000 µg/m³
This parameter defines the quality range for the indication of good air quality with the colour green. The quality range always starts at 0.	

Average air quality (yellow)	100...**1000**...5000 to 2000...**4000**...9900 µg/m³
This parameter defines the quality range for the indication of medium air quality with the colour yellow. The quality range is automatically determined by the parameterisation of the "Good air quality" and "Poor air quality" ranges.	

Poor air quality (red)	2000....**4000**...9900 to **10000** µg/m³
This parameter defines the quality range for the indication of poor air quality with the colour red. The quality range always ends at 10000.	

Hysteresis	100...**300**...1000 µg/m³
This parameter defines the hysteresis, whereby a change in the quality range is displayed with a delay in order to delay a change of colour in the display. This avoids frequent changes to the displayed area.	

Show info graphic	**Active** Inactive
This parameter shows and hides an infographic in the parameter dialogue for exemplary visualisation of the limit values.	

Display warning message	**Active** Inactive
The device shows an open window in the centre left of the display when this indicator is activated. By activating the "Show warning message" parameter, the ETS offers the "Window contact - default" communication object, which can be used to show or hide the "open window" symbol in the display.	

Disable operation	**Active** Inactive
In addition, operation can be blocked on the device when the window is open. If a window is signalled as open, operation of the control surfaces of the appliance is blocked. Any operations are not analysed and processed. The device signals that operation is blocked when the window is open by flashing the window symbol. At the same time, the display brightness changes to the value "During operation" for 20 seconds.	

12.1.2 Object list

Function	Name	Type	DPT	Flag
Window contact - default	Display - Input	1-bit	1,019	C, -, W, T, U
1-bit object for specifying and evaluating a window contact. The received value "1 = Open" or "0 = Closed" specifies whether the "open window" symbol is shown or hidden in the display. The object is offered in the ETS when the "Display warning message" parameter is activated under Window status when window is open. In addition, operation can be blocked on the device when the window is open. If a window is signalled as open, operation of the control surfaces of the appliance is blocked. Any operations are not analysed and processed.				

Function	Name	Type	DPT	Flag
Operating lock - Status	Display - Output	1-bit	1,003	C, R, -, T, A
1-bit object for outputting the current status of the operating lock (0 = operating lock switched off / 1 = operating lock switched on).				

Function	Name	Type	DPT	Flag
Operating lock - default	Display - Input	1-bit	1,003	C, -, W, T, U
1-bit object for switching the operating lock on and off via object (0 = switch off operating lock / 1 = switch on operating lock).				

Function	Name	Type	DPT	Flag
External humidity (external sensor)	Display - Input	2-byte	9,007	C, -, W, T, U
2-byte object for coupling an external KNX humidity sensor or a controller extension. This enables cascading of several humidity sensors for humidity measurement. The temperature value must always be specified in the format "%".				

Function	Name	Type	DPT	Flag
Actual temperature display (external sensor)	Display - Input	2-byte	9,001	C, -, W, T, U
2-byte object used to connect an external KNX room temperature sensor or a controller extension unit for indication on the display. The temperature value must always be specified in the format "°C".				

12.2 Display brightness

The brightness of the display is adjustable. Up to four brightness values for a day and night mode can be parameterised for the display in the ETS.

The display can operate in a continuous mode with one brightness value "During operation" and one brightness value "In idle state" or it can optionally operate in a day and night mode, each with two different brightness values for "During operation" and "In idle state". Switching between day and night mode takes place via an object, whereby the object polarity can be parameterised.

The brightness is set in the ETS via 10 levels. Each level corresponds to a brightness level stored in the device as a percentage.

Brightness level in the ETS	Brightness of the display
1	2 per cent
2	20 per cent
3	30 per cent
4	40 per cent
5	50 per cent
6	60 per cent
7	70 per cent
8	80 per cent
9	90 per cent
10	100 per cent

The brightness can be set during operation via a communication object. After enabling via the "Brightness setting via object" parameter, a brightness value of 0 to 100 per cent can be specified for the display via the "Brightness" communication object via the bus.

i If brightness values of less than 10 per cent are received via the bus, the device sets the brightness of the display to brightness level 1 = 2 per cent.

The display brightness after bus voltage return can be set in the parameters. The brightness settings via the communication object remain stored in the device in the event of a power failure, for example, and can be set again automatically by the device after bus voltage return.

After an ETS programming operation, the device sets the brightness levels defined in the parameters for the various modes and statuses.

GIRA

12.2.1 Table of parameters

Parameter page "Display -> Display settings"

Day and night mode	Active Inactive
With "Active": The display operates in a day and night mode, each with two different brightness values for "During operation" and "In idle state". With "Inactive": The display operates in a continuous mode with a brightness value "During operation" and a brightness value "In idle state". Switching between day and night mode takes place via an object, whereby the object polarity can be parameterised.	

During operation	1...7...10
This parameter defines the brightness of the display in continuous mode and during operation. The brightness remains set for 20 seconds after the last operation. The brightness is set in the ETS via 10 levels. Each level corresponds to a brightness level stored in the device as a percentage (1 = 2 %, 2 = 20 %, 3 = 30 %, 4 = 40%, 5 = 50 %, 6 = 60 %, 7 = 70%, 8 = 80 %, 9 = 90 %, 10 = 100 %).	

In idle state	1...3...10
This parameter defines the brightness of the display in continuous mode and in idle mode, which is activated by the device 20 seconds after the last operation. The brightness is set in the ETS via 10 levels. Each level corresponds to a brightness level stored in the device as a percentage (1 = 2 %, 2 = 20 %, 3 = 30 %, 4 = 40%, 5 = 50 %, 6 = 60 %, 7 = 70%, 8 = 80 %, 9 = 90 %, 10 = 100 %).	

During operation, by day	1...7...10
This parameter defines the brightness of the display in day and night mode, during the day and during operation. The brightness remains set for 20 seconds after the last operation. The brightness is set in the ETS via 10 levels. Each level corresponds to a brightness level stored in the device as a percentage (1 = 2 %, 2 = 20 %, 3 = 30 %, 4 = 40%, 5 = 50 %, 6 = 60 %, 7 = 70%, 8 = 80 %, 9 = 90 %, 10 = 100 %).	

During operation, at night	1...4...10
This parameter defines the brightness of the display in day and night mode, at night and during operation. The brightness remains set for 20 seconds after the last operation. The brightness is set in the ETS via 10 levels. Each level corresponds to a brightness level stored in the device as a percentage (1 = 2 %, 2 = 20 %, 3 = 30 %, 4 = 40%, 5 = 50 %, 6 = 60 %, 7 = 70%, 8 = 80 %, 9 = 90 %, 10 = 100 %).	

In idle state, by day	1...**3**...10
This parameter defines the brightness of the display in day and night mode, during the day and in idle mode, which is activated by the device 20 seconds after the last operation. The brightness is set in the ETS via 10 levels. Each level corresponds to a brightness level stored in the device as a percentage (1 = 2 %, 2 = 20 %, 3 = 30 %, 4 = 40%, 5 = 50 %, 6 = 60 %, 7 = 70%, 8 = 80 %, 9 = 90 %, 10 = 100 %). x	

In idle state, at night	1...**1**...10
This parameter defines the brightness of the display in day and night mode, at night and in idle mode, which is activated by the device 20 seconds after the last operation. The brightness is set in the ETS via 10 levels. Each level corresponds to a brightness level stored in the device as a percentage (1 = 2 %, 2 = 20 %, 3 = 30 %, 4 = 40%, 5 = 50 %, 6 = 60 %, 7 = 70%, 8 = 80 %, 9 = 90 %, 10 = 100 %).	

Brightness setting via object	Active **Inactive**
The brightness can be set during operation via a communication object. After enabling via this parameter, the display can be given a brightness value of 0 to 100 per cent via the bus using the "Brightness" communication object. i If brightness values of less than 10 per cent are received via the bus, the device sets the brightness of the display to brightness level 1 = 2 per cent.	

After the bus voltage returns	State as before bus voltage failure **Query current status** No reaction
The display brightness after bus voltage return is set by this parameter. With "Status as before bus voltage failure": The device sets the display to the same brightness as before the bus voltage failure. With "Query current status": "No reaction":	

Object - Polarity	**0 = day / 1 = night** 1 = day / 0 = night
This parameter defines the object polarity of the "Day and night mode" communication object.	

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12.2.2 Object list

Function	Name	Type	DPT	Flag
Day and night mode	Display - Input	1-bit	1,024	C, -, W, T, U
1-bit object for switching between day and night mode. The object polarity can be configured.				

Function	Name	Type	DPT	Flag
Brightness	Display - Input	1-byte	5,001	C, -, W, T, U
1-byte object for specifying the display brightness via object. Brightness values from 0 to 100 per cent can be specified via the bus. i If brightness values of less than 10 per cent are received via the bus, the device sets the brightness of the display to brightness level 1 = 2 per cent.				

13 Extensions

The device has four independent extension unit channels. The channels can be used as inputs or outputs. Channel 1 can be used to connect a temperature sensor. The device can read in up to four contact states potential-free via the inputs in event of a shared reference potential and transmit telegrams to the bus accordingly.

It is possible to deactivate channels by deselecting the parameter "Use" (e. g. as a reserve for future applications). Deactivated channels have no parameters or communication objects.

> **i** The connection of 230 V signals or other external voltages to the inputs is not permitted!

Channel configuration

Each channel can be operated and parameterised separately. Individual channels can execute the following channel functions:

- Push-button
- Switch
- Door/window status
- Leakage/condensation sensor
- Pulse counter
- Output
- Temperature sensor (channel 1 only)

The following connection example shows a possible connection of the extensions:

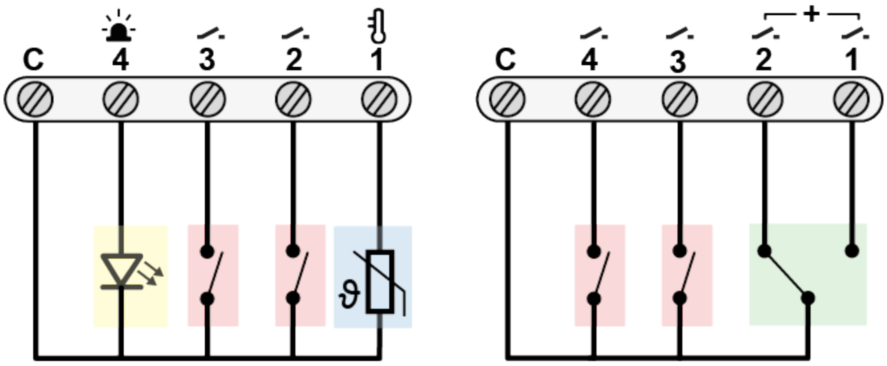

Figure 19: Connection example for extensions

Combining

Adjacent channels can be combined in activated condition (e. g. E1 + E2). Combined channels can execute the following channel functions:

- Push-button
- Door/window status

ℹ Combined channels can allow, for example, multi-switches (top/bottom), series push-buttons / venetian blind push-buttons / rotary switches, reversing switches/push-buttons to act interactively on a venetian blind via two inputs/ channels.

ℹ Combined channels in the "door/window status" channel function can, for example, generate a shared status message for a window with two magnetic contacts.

13.1 Extension unit channel configuration parameters

Extensions

I ... Use	Checkbox (yes / no)
Input channels that are not required can be deactivated.	

I ... Combining	Ex + Ey / no (x and y are the channel numbers of neighbouring channels that can be combined)
The combination with the neighbouring channel can be defined for each input channel. This parameter should be set at the start because all other parameters and assignments of the group addresses to the communication objects are dependent on it.	

13.2 Push-button

The "push-button" channel function can be parametrised for each input. The following functions are available in the "push-button" channel function:

- Switching
- Priority control
- Dimming and colour temperature
- Venetian blind / shutter / awning / roof window
- Value transmitter
- Scene extension unit
- Short and long button operation
- Room temperature control point

The ETS provides the corresponding parameters and communication objects dynamically for the function according to the parameterised function.

The contact type and debouncing time are to be parameterised separately for each channel. A disabling function can be activated optionally for each push-button channel.

i The "push-button" channel function is recommended if telegrams are to be transmitted on the KNX, depending on how long the channel/push-button was actuated. For example in the "dimming", "venetian blind", " value transmitter with value adjustment", "telegram upon short or long button actuation" functions or with the "RGB(W) colour adjustment".

13.2.1 Table of parameters

The following parameters are generally available for the "push-button" channel function.

Function	**Switching** Priority control Dimming and colour temperature Venetian blind / shutter / awning / roof window Value transmitter Scene extension unit Short and long button operation Room temperature control point
This parameter determines the function of the push-button connected to the channel.	

Contact type	**NO contact** NC contact
This parameter determines the contact type of the push-button connected to the channel.	

Debounce time	4 ... **10** ... 255 ms
This parameter specifies the software debouncing time. A signal edge is evaluated at the input after a delay based on this time.	

13.2.2 Switching

In the "push-button" channel function, the push-button can be parameterised in the "switching" function. The ETS indicates up to three communication objects for each channel for the "switching" function. The parameters can be used to determine the value the "switching" object is to obtain when the push-button is pressed and/or released. Furthermore, the behaviour of the channel after the bus voltage returns can be parameterised and a disabling function activated. No distinction is made between a brief or long press.

13.2.2.1 Table of parameters

The following parameters are available in the "push-button" channel function with the parameterised "switching" function.

When pressed	no reaction ON OFF **TOGGLE**
This parameter defines the reaction when the push-button is pressed.	

When released	**no reaction** ON OFF TOGGLE
This parameter determines the reaction when the push-button is released.	

After the bus voltage returns	**no reaction** transmit current state ON OFF
This parameter determines the reaction after the bus voltage returns. Either no telegram, a telegram according to the current input state at the channel, an ON telegram or an OFF telegram is transmitted on the bus according to the parameterisation. The reaction after the bus voltage returns takes place only after the parameterised "delay after bus voltage returns" expires ("General" parameter page).	

Disabling function	**Inactive** Active
This parameter enables the disabling function for the channel.	

At the beginning of the disabling function	**no reaction** ON OFF TOGGLE
Besides disabling the channel, the device can immediately react when the disabling occurs. This parameter defines the reaction of the channel at the beginning of the disabling.	

At the end of the disabling function	**no reaction** transmit current state ON OFF TOGGLE
Besides disabling the channel, the device can immediately react at the end of the disabling. This parameter defines the reaction of the channel at the end of the disabling.	

Object polarity	**0 = Released / 1 = Locked** 1 = Released / 0 = Locked
This parameter defines the value of the disabling object at which the disabling function is active.	

13.2.2.2 Object list

The following communication objects are available in the "push-button" channel function with the parameterised "switching" function. The name can be adjusted with the "Name" parameter.

Function	Name	Type	DPT	Flag
Switching	I … - Output	1-bit	1,001	C, R, -, T, A
1-bit object for transmission of switching telegrams (ON, OFF).				

Function	Name	Type	DPT	Flag
Switching - Status	I … - Input	1-bit	1,001	C, -, W, -, U
1-bit object for receiving feedback telegrams (ON, OFF). This object is visible if the "When pressed" parameter or "When released" parameter is configured to "TOGGLE".				

Function	Name	Type	DPT	Flag
Switching - Disabling	I … - Input	1-bit	1,003	C, -, W, -, U
1-bit object for activating or deactivating the disabling function. The object polarity can be configured.				

13.2.3 Priority control

In the "push-button" channel function, the push-button can be parameterised for the "forced position" function. The ETS indicates up to two communication objects for each channel for the "forced position" function. The parameters can be used to determine the value the "forced position" object is to obtain when the push-button is pressed and/or released. Furthermore, the behaviour of the channel after the bus voltage returns can be parameterised and a disabling function activated. No distinction is made between a brief or long press.

13.2.3.1 Table of parameters

The following parameters are available in the "push-button" channel function with the parameterised "forced position" function.

When pressed	no reaction **Switch ON with priority** Switch OFF with priority Remove priority control
This parameter defines the reaction when the push-button is pressed.	

When released	**no reaction** Switch ON with priority Switch OFF with priority Remove priority control
This parameter determines the reaction when the push-button is released.	

After the bus voltage returns	**no reaction** transmit current state Switch ON with priority Switch OFF with priority Remove priority control
This parameter determines the reaction after the bus voltage returns. Either no telegram, a telegram according to the current input state at the channel, a forcing active ON telegram, a forcing active OFF telegram or a forcing inactive telegram is transmitted on the bus according to the parameterisation. The reaction after the bus voltage returns takes place only after the parameterised "delay after bus voltage returns" expires ("General" parameter page).	

Disabling function	**Inactive** Active
This parameter enables the disabling function for the channel.	

At the beginning of the disabling function	**no reaction** Switch ON with priority Switch OFF with priority Remove priority control
Besides disabling the channel, the device can immediately react when the disabling occurs. This parameter defines the reaction of the channel at the beginning of the disabling.	

At the end of the disabling function	**no reaction** transmit current state Switch ON with priority Switch OFF with priority Remove priority control
Besides disabling the channel, the device can immediately react at the end of the disabling. This parameter defines the reaction of the channel at the end of the disabling.	

Object polarity	**0 = Released / 1 = Locked** 1 = Released / 0 = Locked
This parameter defines the value of the disabling object at which the disabling function is active.	

13.2.3.2 Object list

The following communication objects are available in the "push-button" channel function with the parameterised "forced position" function. The name can be adjusted with the "Name" parameter.

Function	Name	Type	DPT	Flag
Priority control	I … - Output	2-bit	2,001	C, R, -, T, A
2-bit input object for activating and deactivating the forced position. With the value "1", bit 1 of the telegram activates the forced position. The assigned channels are then locked in the state specified by bit 0 ("0" = OFF / "1" = ON). The value "0" in bit 1 deactivates the forced position again. 0x = forcing inactive 10 = forcing active, OFF 11 = forcing active, ON				

Function	Name	Type	DPT	Flag
Forced position -Disabling	I … - Input	1-bit	1,003	C, -, W, -, U
1-bit object for activating or deactivating the disabling function. The object polarity can be configured.				

13.2.4 Dimming and colour temperature

In the "push-button" channel function, the push-button can be parameterised for the "dimming and colour control" function. The ETS indicates up to four communication objects for each channel for the "dimming and colour control" function. The parameters can be used to determine the value the objects "Dimming - ..." obtain when the button is pressed. Furthermore, the behaviour of the channel after the bus voltage returns can be parameterised and a disabling function activated.

Generally, the device transmits a switching telegram after a brief actuation and a dimming telegram after a long actuation. In the standard parameterisation the device transmits a telegram for stopping the dimming action after a long actuation. The duration of pressing the button between switching and dimming is 400 milliseconds in the default parameterisation and can be set in the advanced parameters. The brightness and/or the colour temperature can be dimmed.

i The time between switching and dimming should be adjusted according to the parameterised debouncing time.

Status

If an actuator is controlled by multiple control points, the actuator must report its switching status back to the 1-bit object "Dimming - Switching - Status" of the channel. Due to the feedback, the device detects that the actuator has changed its switching status by input from another element and adjusts the dimming direction accordingly. The status is visible only if switchover commands are set.

i The dimming direction is always only evaluated and switched locally, unless the actuator changes its switching status due to input from multiple elements (e. g. lighting ON / change of brightness value only). The 4-bit dimming objects and the 3-byte combi object are not tracked via the bus.

Advanced configuration options

The device has advanced parameters for the dimming function. If necessary, these advanced parameters can be activated and thus be made visible.

In the continuous dimming mode (100%), the device transmits a telegram only at the beginning of the long press to start the dimming process and generally a stop telegram after the end of the press. For dimming in small levels it may be useful if the device repeats the dimming telegram in case of a sustained press for a time that can be set (parameter "Telegram repetition"). The stop telegram after the end of the press is then not needed.

The following settings are made if the advanced parameters are switched to invisible (advanced parameters = inactive):

– Time between switching and dimming = 400 ms
– Dimming ranges = 100 %
– Stop telegram = active
– Telegram repetition = inactive

13.2.4.1 Brightness

The brightness is dimmed in the default configuration.

The control of the brightness in the "Dimming and colour temperature" function distinguishes between dual-area operation and single-area operation. The parameter "Brightness on pressing" defines the single-area or dual-area dimming function.

Dual-area operation	Single-area operation
Brighter (ON)	Brighter/darker (TOGGLE)
Darker (OFF)	Brighter (TOGGLE)
	Darker (TOGGLE)

With dual-area operation, the device transmits a telegram for switching on or off after a brief actuation, and a telegram for increasing the brightness ("Brighter") or dimming ("Darker") after a long actuation.

In the event of single-area operation, the device transmits ON and OFF telegrams alternately ("TOGGLE") each time the respective button is briefly pressed. If the button is pressed and held, the device transmits either a telegram for dimming up ("brighter") or down ("darker") or the "Brighter" and "Darker" telegrams alternately.

13.2.4.2 Colour temperature

The "Dimming and colour temperature" function with the control of the colour temperature distinguishes between dual-area operation and single-area operation. The parameter "Colour temperature on pressing" defines the single-surface or double-surface dimming function.

Dual-area operation	Single-area operation
Colder (ON)	Colder / warmer (TOGGLE)
Warmer (OFF)	Colder (TOGGLE)
	Warmer (TOGGLE)

In the event of dual-area operation, the device transmits a telegram for switching on or off after short actuation and a telegram for dimming to a colder or warmer colour temperature after long actuation.

In the event of single-area operation, the device transmits ON and OFF telegrams alternately ("TOGGLE") each time the respective button is briefly pressed. In the event of long actuation, the device transmits either a telegram for dimming colder or warmer or the "Colour temperature colder" and "Colour temperature warmer" telegrams alternately.

13.2.4.3 Brightness and colour temperature

The dimming process can only adjust either the brightness or the colour temperature via individual objects.

Optionally, the brightness and the colour temperature can also be adjusted together via a combi object.

The "Dimming and colour temperature" function with the control of the brightness and colour temperature distinguishes between dual-area operation and single-area operation. The parameter "Brightness + colour temperature on pressing" defines the single-area or dual-area dimming function.

Dual-area operation	Single-area operation
Brighter + colder (ON)	Brighter + colder / darker + warmer (TOGGLE)
Darker + warmer (OFF)	Brighter + colder (TOGGLE)
	Darker + warmer (TOGGLE)

In dual-area operation, the device sends a telegram for switching on or off in the event of brief actuation and a telegram for brighter/colder or darker/warmer dimming in the event of long actuation.

In the event of single-area operation, the device transmits ON and OFF telegrams alternately ("TOGGLE") each time the respective button is briefly pressed. In the event of long actuation, the device transmits either a telegram for brighter/colder dimming or darker/warmer dimming or the "Brighter + colder" and "Darker + warmer" telegrams alternately.

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13.2.4.4 Table of parameters

The following parameters are available in the "push-button" channel function with the parameterised "Dimming and colour temperature" function.

Dimming control	**Single object: brightness** **Single object: colour temperature** Combi object: brightness + colour temperature
With this parameter, either the brightness or the colour temperature can be dimmed by means of an individual object, or the brightness and colour temperature can be controlled together by means of a combination object	

Brightness on pressing	no reaction **Brighter (ON)** Darker (OFF) Brighter/darker (TOGGLE) Brighter (TOGGLE) Darker (TOGGLE)
This parameter defines the reaction when a button is pressed. If the device is to toggle on a brief press, the corresponding switching objects of other sensors with the same function must be interlinked. This parameter is visible only if: dimming control = individual object: brightness	

Colour temperature on pressing	no reaction **Colder (ON)** Warmer (OFF) Colder / warmer (TOGGLE) Colder (TOGGLE) Warmer (TOGGLE)
This parameter defines the reaction when a button is pressed. If the device is to toggle on a brief press, the corresponding switching objects of other sensors with the same function must be interlinked. This parameter is visible only if: dimming control = individual object: colour temperature	

Brightness + colour temperature on pressing	no reaction Brighter + colder (ON) Darker + warmer (OFF) **Brighter + colder / darker + warmer (TOGGLE)** Brighter + colder (TOGGLE) Darker + warmer (TOGGLE)
This parameter defines the reaction when a button is pressed. If the device is to toggle on a brief press, the corresponding switching objects of other sensors with the same function must be interlinked. This parameter is visible only if: dimming control = combination object: brightness + colour temperature	

Extended settings	Active **Inactive**
When the advanced parameters are activated, the ETS shows the following parameters.	

Time between switching and dimming	**0** ... 50 s | 100 ... **400** ... 990 ms
This parameter defines how long the button must be pressed for a dimming telegram to be transmitted.	

Dim brightness by	1.5% 3% 6% 12.5% 25% 50% **100%**
This parameter sets the relative dimming level when the brightness is increased. On each button actuation, the brightness is changed at maximum by the configured step width. It is recommended that the device repeats the dimming telegrams automatically, particularly with a small dimming level (see "Telegram repetition").	

Dimming darker by	1.5% 3% 6% 12.5% 25% 50% **100%**
This parameter sets the relative dimming level when the brightness is reduced. On each button actuation, the brightness is changed at maximum by the configured step width. It is recommended that the device repeats the dimming telegrams automatically, particularly with a small dimming level (see "Telegram repetition").	

Colour temperature colder by	1.5% 3% 6% 12.5% 25% 50% **100%**
This parameter sets the relative dimming level when the colour temperature is increased. On each button actuation, the brightness is changed at maximum by the configured step width. It is recommended that the device repeats the dimming telegrams automatically, particularly with a small dimming level (see "Telegram repetition").	

Colour temperature warmer by	1.5% 3% 6% 12.5% 25% 50% **100%**
This parameter sets the relative dimming level when the colour temperature is reduced. On each button actuation, the brightness is changed at maximum by the configured step width. It is recommended that the device repeats the dimming telegrams automatically, particularly with a small dimming level (see "Telegram repetition").	

<table>
<tr><td>Stop telegram</td><td>Active
Inactive</td></tr>
<tr><td colspan="2">On "Active" the device transmits a telegram for stopping the dimming process when the button is released.
When the device transmits telegrams for dimming in smaller levels, the stop telegram is generally not needed.</td></tr>
</table>

<table>
<tr><td>Telegram repetition</td><td>Active
Inactive</td></tr>
<tr><td colspan="2">This parameter can be used to activate telegram repetition for dimming. With telegram repetition activated, the device cyclically sends relative dimming telegrams (in the parameterised step width) to the bus if the button is pressed long.</td></tr>
</table>

<table>
<tr><td>Time between two telegrams</td><td>200 ms
300 ms
400 ms
500 ms
750 ms
1000 ms
2000 ms</td></tr>
<tr><td colspan="2">This parameter defines the interval at which the dimming telegrams are automatically repeated in the telegram repetition mode.
This parameter is only visible if "Telegram repetition = active"!</td></tr>
</table>

<table>
<tr><td>After the bus voltage returns</td><td>no reaction
transmit current state
ON
OFF</td></tr>
<tr><td colspan="2">This parameter determines the reaction after the bus voltage returns.
Either no telegram, a telegram according to the current input state at the channel, an ON telegram or an OFF telegram is transmitted on the bus according to the parameterisation.
The reaction after the bus voltage returns takes place only after the parameterised "delay after bus voltage returns" expires ("General" parameter page).</td></tr>
</table>

<table>
<tr><td>Disabling function</td><td>Inactive
Active</td></tr>
<tr><td colspan="2">This parameter enables the disabling function for the channel.</td></tr>
</table>

At the beginning of the disabling function	**no reaction** ON OFF TOGGLE
Besides disabling the channel, the device can immediately react when the disabling occurs. This parameter defines the reaction of the channel at the beginning of the disabling.	

At the end of the disabling function	**no reaction** transmit current state ON OFF TOGGLE
Besides disabling the channel, the device can immediately react at the end of the disabling. This parameter defines the reaction of the channel at the end of the disabling.	

Object polarity	**0 = enable / 1 = disable** 1 = enable / 0 = disable
This parameter defines the value of the disabling object at which the disabling function is active.	

13.2.4.5 Object list

The following communication objects are available in the "push-button" channel function with the parameterised "dimming and colour temperature" function. The name can be adjusted with the "Name" parameter.

Function	Name	Type	DPT	Flag
Dimming - Switching	I … - Output	1-bit	1,001	C, R, -, T, A
1-bit object for transmission of switching telegrams (ON, OFF).				

Function	Name	Type	DPT	Flag
Dimming - Brightness	I … - Output	4-bit	3,007	C, R, -, T, A
4-bit object for sending relative dimming telegrams to adjust the brightness.				

Function	Name	Type	DPT	Flag
Dimming - Brightness and colour temperature	I … - Output	3-byte	250,600	C, R, -, T, A
3-byte object for sending dimming telegrams for adjusting the brightness and the colour temperature in combination.				

Function	Name	Type	DPT	Flag
Dimming - Switching - Status	I … - Output	1-bit	1,001	C, -, W, -, U
1-bit object for receiving feedback telegrams (ON, OFF). This object is visible if the parameter " ... when pressed" is parameterised to "TOGGLE".				

Function	Name	Type	DPT	Flag
Dimming - Colour temperature fading	I … - Output	4-bit	3,007	C, R, -, T, A
4-bit object for sending relative dimming telegrams to adjust the colour temperature.				

Function	Name	Type	DPT	Flag
Dimming - Disabling	I … - Input	1-bit	1,003	C, -, W, -, U
1-bit object for activating or deactivating the disabling function. The object polarity can be configured.				

13.2.5 Venetian blind / shutter / awning / roof window

In the "push-button" channel function, the push-button can be parameterised for the "venetian blind / shutter / awning / roof window" function. The ETS indicates up to three communication objects for each channel for the "venetian blind / shutter / awning / roof window" function. The parameters can be used to determine the values the "Venetian blind" objects obtain when the push-button is pressed. Furthermore, the behaviour of the channel after the bus voltage returns can be parameterised and a disabling function activated.

The “Type of blind/shutter“ parameter can be used to select whether “Venetian blind“ or “shutter / awning / skylight“ are to be controlled. The selectable values of the “Command sequence“ parameter vary, depending on the setting.

The "Venetian blind / shutter / awning / skylight" function distinguishes between dual-area operation (UP, DOWN) and single-area operation (TOGGLE). The "Command on pressing" parameter defines the single-area or double-area blind function.

Dual-area operation	Single-area operation
UP	TOGGLE
DOWN	

Dual-area operation means that e. g. the device transmits a telegram for upward movement if one channel is actuated and a telegram for downward movement if a different channel is actuated.

Single-area operation means the device changes the direction of the long-time telegram after each long actuation. Several short time telegrams in succession have the same direction.

Status

If the actuator can be controlled from several sensors, a faultless single-area operation requires that the long-time objects of the control elements are interlinked. The device would otherwise not be able to detect that the actuator has been addressed from another sensor, in which case it would have to be actuated twice during the next use in order to produce the desired reaction.

Operating concepts

For the control of Venetian blind, shutter, awning or similar drives, the device supports four operating concepts in which the telegrams are transmitted in different time sequences. The device can therefore be used to operate a wide variety of drive configurations.

Operating concept "Step - Up/Down - Step":

i The "Step - Up/down – Step" operating concept replaces the "Short - Long - Short" operating concept.

When selecting the operating concept "Step – Up/down – Step", the device behaves as follows:

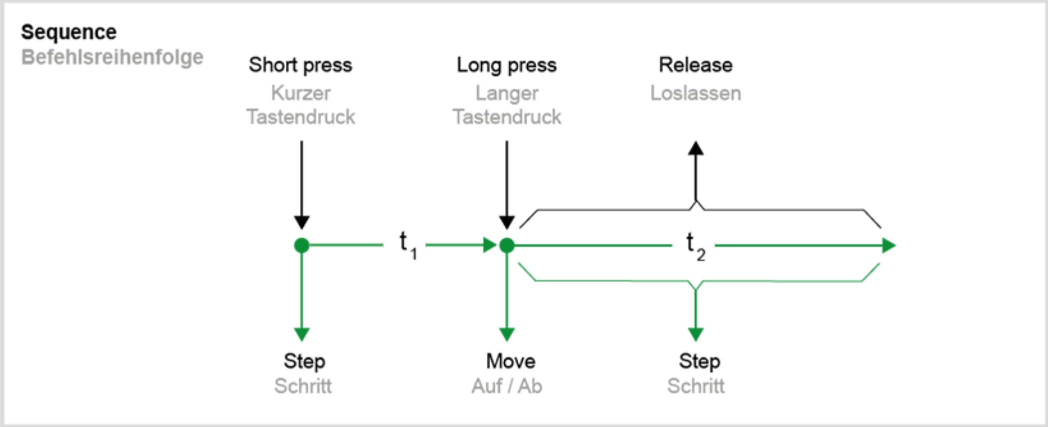

Figure 20: Operating concept "Step - Up/down - Step"

– Immediately on pressing the button, the device transmits a short time telegram. This stops a running drive and starts the time t1 ("long button actuation"). No other telegram will be sent if the button is released within t1. This short time serves the purpose of stopping a continuous movement.
The time "long button actuation from" selected in the device should be shorter than the short-time operation of the actuator to prevent jerky motion of the Venetian blind.

– If the button is kept depressed for longer than t1, the push-button will send a long-time telegram at the end of t1 to move the drive, and the time t2 ("slat adjustment time window") will be started.

– If the button is released within the time window, the device will send another short-time telegram. This function is used for adjusting the slats of a Venetian blind. The function permits stopping the slats in any position during their rotation.
The "slat adjustment time window" should be chosen as required by the drive to completely rotate the slats. If the selected "slat adjustment time window" is longer than the complete running time of the drive, a pushbutton function is possible as well. This means that the drive is active only when the button is kept depressed.

– If the button is kept depressed for longer than t2, the device will not send another telegram. The drive remains on until the end position is reached.

Operating concept "Up/Down – Step":

i The "Up/down – Step" operating concept replaces the "Long - Short" operating concept.

If the operating concept "Up/down – Step" is selected, the device behaves as follows:

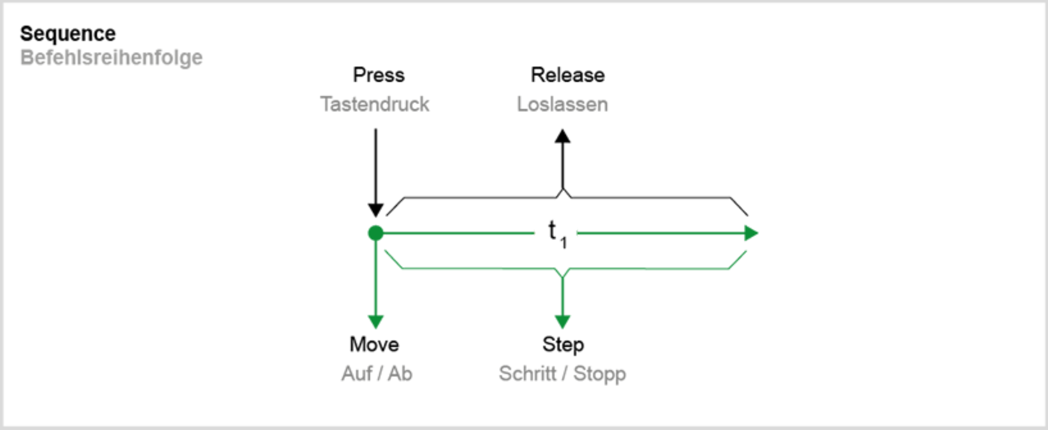

Figure 21: Operating concept "Up/Down - Step"

– Immediately on pressing the button, the device transmits a long time telegram. The drive begins to move and the time t1 ("slat adjustment time window") is started.

ℹ Venetian blind actuators should generate a break when changing the direction of travel to prevent motor damage.

– If the button is released within the slat adjustment time window, the device will send a short-time telegram. This function is used for adjusting the slats of a Venetian blind. The function permits stopping the slats in any position during their rotation.
The "slat adjustment time window" should be chosen as required by the drive to completely rotate the slats. If the selected "slat adjustment time window" is longer than the complete running time of the drive, a pushbutton function is possible as well. This means that the drive is active only when the button is kept depressed.

– If the button is kept depressed for longer than t1, the device will not send another telegram. The drive remains on until the end position is reached.

Operating concept "Step - Up/Down":

ℹ The "Step - Up/down" operating concept replaces the "Short - Long" operating concept.

If the operating concept "Step – Up/down" is selected, the device will behave as follows:

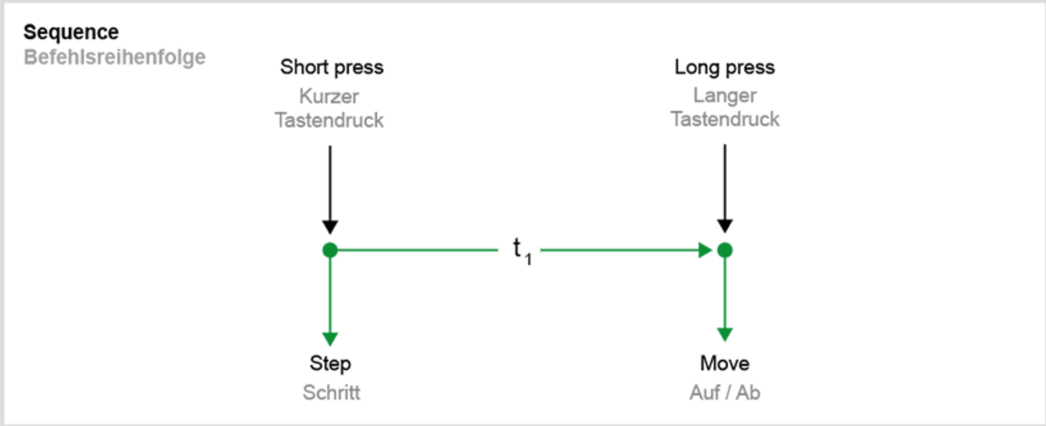

Figure 22: Operating concept "Step - Up/Down"

- Immediately on pressing the button, the device transmits a short time telegram. This stops a running drive and starts the time t1 ("long button actuation"). No other telegram will be sent if the button is released within t1. This short time serves the purpose of stopping a continuous movement.
  The time "long button actuation from" selected in the device should be shorter than the short-time operation of the actuator to prevent jerky motion of the Venetian blind.
- If the button is kept depressed for longer than t1, the push-button will transmit a long-time telegram to start the drive at the end of t1.
- No further telegram is transmitted when the push-button is released. The drive remains on until the end position is reached.

Operating concept "Up/Down - Step or step":

i The "Up/down – Step or step" operating concept replaces the "Long - Short or short" operating concept.

If the operating concept "Up/down – Step or step" is selected, the device will behave as follows:

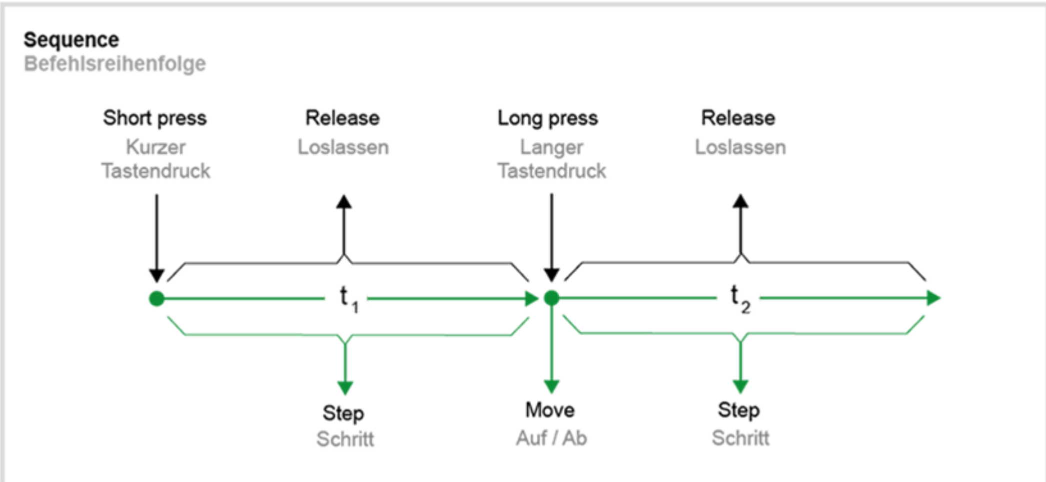

Figure 23: Operating concept "Up/Down – Step or step"

- Immediately after pressing the button, the device starts the time t1 ("long button actuation") and waits. If the button is released again before t1 expires, the device will send a short-time telegram. This telegram can be used to stop a running drive. A stationary drive rotates the slats by one level.
- If the button is kept depressed after t1 expires, the device will send a long-time telegram and start the time t2 ("slat adjustment time window").

i Venetian blind actuators should generate a break when changing the direction of travel to prevent motor damage.

- If the button is released within t2, the device will send another short-time telegram. This function is used for adjusting the slats of a Venetian blind. The function permits stopping the slats in any position during their rotation.
  The "slat adjustment time window" should be chosen as required by the drive to completely rotate the slats. If the selected "slat adjustment time window" is longer than the complete running time of the drive, a pushbutton function is possible as well. This means that the drive is active only when the button is kept depressed.
- If the button is kept depressed for longer than t2, the device will not send another telegram. The drive remains on until the end position is reached.

13.2.5.1 Table of parameters

The following parameters are available in the "push-button" channel function with the parameterised function "venetian blind / shutter / awning / roof window".

Type of blind/shutter	Venetian blind **Shutter / awning / roof window**
This parameter defines the type of blind/shutter to be controlled and optimises the available setting options of the channel function.	

Command on pressing	UP DOWN **TOGGLE**
This parameter defines the running direction of the drive on pressing the button. If the setting is "TOGGLE", the direction is changed after each long time command. If several devices are to control the same drive, the long-time objects of the devices must be interlinked to ensure that the running direction can be changed correctly.	

Command sequence	Up/down - Step **Step - Up/down**
Two different operating concepts can be selected to actuate the "shutter / awning / roof window" blind/shutter types.	

Command sequence	**Step - Up/down - Step** Up/down - Step Step - Up/down Step - Up/down or step
For Venetian blind control, four different operating concepts can be selected.	

Long button actuation from (t1)	**0** ... 59 s | 100 ... **400** ... 990 ms
This parameter sets the time after which the long-time operation will be evaluated on pressing the button. This parameter is not visible for the "command sequence = Up/down - Step"	

Time window for slat adjustment (t2)	**0** ... 59 s | 0 ... **500** ... 990 ms
The time during which a transmitted MOVE telegram can be terminated by releasing the button (STEP) is set here. This function serves to adjust the slats of a venetian blind. This parameter is not visible for the "command sequence = Step - Up/down"	

Show info graphic	**Active** Inactive
If info graphic is activated, the graphic diagram of the command sequence and related text information are displayed.	

After the bus voltage returns	**no reaction** transmit current state UP DOWN
This parameter determines the reaction after the bus voltage returns. Either no telegram, a telegram according to the current input state at the channel, an UP telegram or a DOWN telegram is transmitted on the bus according to the parameterisation. The reaction after the bus voltage returns takes place only after the parameterised "delay after bus voltage returns" expires ("General" parameter page).	

Disabling function	**Inactive** Active
This parameter enables the disabling function for the channel.	

At the beginning of the disabling function	**no reaction** UP DOWN
Besides disabling the channel, the device can immediately react when the disabling occurs. This parameter defines the reaction of the channel at the beginning of the disabling.	

At the end of the disabling function	**no reaction** transmit current state UP DOWN
Besides disabling the channel, the device can immediately react at the end of the disabling. This parameter defines the reaction of the channel at the end of the disabling.	

Object polarity	**0 = Released / 1 = Locked** 1 = Released / 0 = Locked
This parameter defines the value of the disabling object at which the disabling function is active.	

13.2.5.2 Object list

The following communication objects are available in the "push-button" channel function with the parameterised function "venetian blind / shutter / awning / roof window". The name can be adjusted with the "Name" parameter.

Function	Name	Type	DPT	Flag
Venetian blind - Short time operation	I … - Output	1-bit	1,007	C, R, -, T, A
1-bit object for the transmission of telegrams with which a venetian blind or shutter drive motor can be stopped or with which the blind slats can be adjusted by short time operation.				

Function	Name	Type	DPT	Flag
Venetian blind - Long time operation	I … - Output	1-bit	1,008	C, R, W, T, A
1-bit object for the transmission of telegrams with which a venetian blind or shutter drive motor can be can be moved upwards or downwards.				

Function	Name	Type	DPT	Flag
Venetian blind - Disabling	I … - Input	1-bit	1,003	C, -, W, -, U
1-bit object for activating or deactivating the disabling function. The object polarity can be configured.				

13.2.6 Value transmitter

In the "push-button" channel function, the push-button can be parameterised for the "value transmitter" function. The ETS indicates up to six communication objects for each channel for the "value transmitter" function. The parameters can be used to determine the value the "value transmitter" objects obtain when the button is pressed.

With the "value transmitter" function, the device sends parameterised values to the bus at the press of a button.

Value adjustment

Furthermore, a value adjustment and the behaviour of the channel after the bus voltage returns can be parameterised and a disabling function activated. No distinction is made between a brief or long press.

In the function as value transmitter with value adjustment, the device transmits the parameterised value when the button is briefly pressed. After the initial value adjustment, the device still transmits the parameterised value or the device takes the value to be transmitted depending on the parameterisation from the value adjustment or from the status object if the button is briefly pressed. This allows fixed or changeable values or values transmitted via the bus to be called up.

Optionally, the channel adjusts the value if the button is pressed for a long time. This allows, for example, absolute dimming of the values to be generated. The direction of the value adjustment can be parameterised in the process. The value adjustment can be configured flexibly by allowing the starting time in the event of pressing the button for a long time and the time between the telegrams to be parameterised.

i The value adjustment is not available, with "DPT 249.600 | colour temperature value + brightness" and "RGBW/HSVW colour value".

Value ranges

The value transmitter knows 14 different value ranges. The parameter "Data point type | Value range" determines the value range used by the value transmitter, depending on the application case:

Function	Function	Lower numerical limit	Upper numerical limit
1-byte value transmitter	0...100%	0%	100%
1-byte value transmitter	0...255	0	255
1-byte value transmitter	0…360°	0°	360°
1-byte value transmitter	0...255%	0%	255%
1-byte value transmitter	-128...127	-128	127

Function	Function	Lower numerical limit	Upper numerical limit
2-byte value trans-mitter	0...65535	0	65535
2-byte value trans-mitter	Colour temperature value	1000 K	10000 K
2-byte value trans-mitter	-32768...32767	-32768	32767
2-byte value trans-mitter	Temperature value	0 °C	40 °C
2-byte value trans-mitter	Brightness value	0 lux	1500 lux
6-byte value trans-mitter	Colour temperature value + brightness	1000 K | 0%	10000 K | 100%
3-byte value trans-mitter	RGB/HSV with col-our wheel sequence	#000000	#FFFFFF
3-byte value trans-mitter	RGB/HSV with brightness adjust-ment	#000000	#FFFFFF
6-byte value trans-mitter	Colour value RGBW/HSVW	#000000 + 0	#FFFFFF + 255

For each of these ranges, the value that can be transmitted to the bus for each button actuation is configurable.

13.2.6.1 Table of parameters

The following parameters are available in the "push-button" channel function with the parameterised "value transmitter" function.

Data point type | Value range	DPT 5.001 | 0 ... 100% **DPT 5.010 | 0 ... 255** DPT 5.003 | 0 ... 360° DPT 5.004 | 0 ... 255% DPT 6.010 | -128 ... 127 DPT 7.001 | 0 ... 65535 DPT 7.600 | 1000 ... 10000 K DPT 8.001 | -32768 ... 32767 DPT 9.001 | 0 ... 40 °C DPT 9.004 | 0 ... 1500 lux DPT 249.600 | Colour temperature value + brightness RGB/HSV with colour wheel sequence (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001) RGB/HSV with brightness adjustment (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001) Colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)
The "value transmitter" function distinguishes between 1-byte, 2-byte 3-byte and 6-byte values. The following parameters and their settings depend on the setting for this parameter.	

Value when pressed	**0** ... 100%
This parameter defines the object value when the button is pressed. It is visible only if "data point type | value range = DPT 5.001 | 0 ... 100%".	

Value when pressed	**0** ... 255
This parameter defines the object value when the button is pressed. It is visible only if "data point type | value range = DPT 5.010 | 0 ... 255".	

Value when pressed	**0** ... 360°
This parameter defines the object value when the button is pressed. It is visible only if "data point type | value range = DPT 5.003 | 0 ... 360°".	

Value when pressed	**0** ... 255%
This parameter defines the object value when the button is pressed. It is visible only if "data point type | value range = DPT 5.004 | 0 ... 255%".	

Value when pressed	-128...**0** ...127
This parameter defines the object value when the button is pressed. It is visible only if "data point type | value range = DPT 6.010 | -128 ... 127".	

Value when pressed	**0** ... 65535
This parameter defines the object value when the button is pressed. It is visible only if "data point type | value range = DPT 7.001 | 0 ... 65535".	

Colour temperature value when pressed	1000 ... **2700** ... 10000 K
This parameter defines the object value when the button is pressed. It is visible only if "data point type | value range = DPT 7.600 | 1000 ... 10000 K".	

Value when pressed	-32768 ... **0** ... 32767
This parameter defines the object value when the button is pressed. It is visible only if "data point type | value range = DPT 8.001 | -32768 ... 32767".	

Temperature value when pressed	0 ... **20** ... 40 °C
This parameter defines the object value when the button is pressed. It is visible only if "data point type | value range = DPT 9.001 | 0 ... 40 °C".	

Brightness value when pressed	0, 50 ... **300** ... 1500 lux
This parameter defines the object value when the button is pressed. It is visible only if "data point type | value range = DPT 9.004 | 0 ... 1500 lux".	

Colour temperature value when pressed	1000 ... **2700** ... 10000 K
This parameter defines the object value when the button is pressed. It is visible only if "data point type | value range = DPT 249.600 | colour temperature value + brightness".	

Brightness value when pressed	**0** ... 100%
This parameter defines the object value when the button is pressed. It is visible only if "data point type | value range = DPT 249.600 | colour temperature value + brightness".	

Adjustment duration in the actuator	0 ... 100 min, 0, **1** ... 59 s, 0 ... 900 ms
This parameter defines the object value when the button is pressed. It is visible only if "data point type | value range = DPT 249.600 | colour temperature value + brightness".	

Colour value when pressed	#000000 ... **#FFFFFF**
This parameter determines the object values of the value transmitter 3-byte (or value transmitter 6-byte), brightness value (V), saturation (S) and colour hue (H) objects when the button is pressed. It is visible with "data point type | value range = RGB/HSV with colour wheel sequence (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001)", "data point type | value range = RGB/HSV with brightness adjustment (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001)" and "data point type | value range = colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)". The value (RGB/HSV) is configured by means of a colour picker. With the data point type | value range "colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)", the white value is configured by means of a separate slider.	

White value when pressed	0 ... **255**
This parameter defines the object value of the white level (W) object when the button is pressed. It is visible only if "data point type | value range = colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)".	

Value adjustment	Active **Inactive**
In the "push-button" channel function, the device can adjust the value in the "value transmitter" function. If the value adjustment is activated by a long button-press, the ETS shows further parameters. i The value adjustment is not available, with "DPT 249.600 | colour temperature value + brightness" and "RGBW/HSVW colour value".	

Start value	same as configured value same as value after last adjustment **Like value from status object**
Value adjustment can begin with different starting values. With "same as configured value": After each long press, the device always starts with the value configured in the ETS. With "same as value after last adjustment": After a long press, the device starts with the value transmitted by itself or by another device with this group address as the last value. With "same as value from status object": When the push-button is pressed for a long time, the device starts with the value that it or another device with this group address transmitted as the last value. i This selection is available only with 1-byte or 2-byte value transmitters.	

Start value	**As parameterised colour value** same as value after last adjustment same as value from status object colour angle (H) same as value from status object RGB

Value adjustment can begin with different starting values.

With "same as parameterised colour value": After each long actuation, the device always starts with the value programmed by the ETS.

With "same as value after last adjustment": After a long press, the device starts with the value transmitted by itself or by another device with this group address as the last value.

With "same as value from colour hue (H) status object": After long actuation, the device starts with the value that it or another device with this group address transmitted as the last value.

With "same as value from RGB status object": After long actuation, the device starts with the value that it or another device with this group address transmitted as the last value.

i This selection is available only with RGB/HSV with colour wheel sequence.

Start value	**As parameterised colour value** same as value after last adjustment same as value from status object brightness (V) same as value from status object RGB

Value adjustment can begin with different starting values.

With "same as parameterised colour value": After each long actuation, the device always starts with the value programmed by the ETS.

With "same as value after last adjustment": After a long press, the device starts with the value transmitted by itself or by another device with this group address as the last value.

With "same as value from brightness (V) status object": After long actuation, the device starts with the value that it or another device with this group address transmitted as the last value.

With "same as value from RGB status object": After long actuation, the device starts with the value that it or another device with this group address transmitted as the last value.

i This selection is available only with RGB/HSV with brightness adjustment.

Direction	upwards downwards Toggling (alternating)

With a long press, the device can either vary the values always in the same direction or it stores the direction of the last adjustment and reverses it on the next button-press.

i This selection is available only with 1-byte or 2-byte value transmitters.

Direction	Colour sequence in clockwise direction (red -> green -> blue -> red -> ...) Colour sequence in anti-clockwise direction (red -> blue -> green -> red -> ...) Toggling colour sequence (alternating when each new rising edge)

With a long press, the device can either vary the values always in the same direction or it stores the direction of the last adjustment and reverses it on the next button-press.

i This selection is available only with RGB/HSV with colour wheel sequence.

Direction	Brighter darker Toggling (alternating)

With a long press, the device can either vary the values always in the same direction or it stores the direction of the last adjustment and reverses it on the next button-press.

i This selection is available only with RGB/HSV with brightness adjustment.

Increment	1 ... 15

In a value adjustment, the device determines the new telegram value from the previous value and the preset step width. If the value falls below the lower limit of the adjustment range or if it exceeds the upper limit, the sensor adapts the step width of the last step automatically.

i This selection is available only with 1-byte value transmitters.

Increment	1, 2, 5, 10, 20, 50, 75, 100, 200, 500, 750, 1000

In a value adjustment, the device determines the new telegram value from the previous value and the preset step width. If the value falls below the lower limit of the adjustment range or if it exceeds the upper limit, the sensor adapts the step width of the last step automatically.

i This selection is available only with 2-byte value transmitters (0 ... 65535 and -32768 ... 32767) available.

Increment	0.5, **1**, 1.5, 2, ..., 40
In a value adjustment, the device determines the new telegram value from the previous value and the preset step width. If the value falls below the lower limit of the adjustment range or if it exceeds the upper limit, the sensor adapts the step width of the last step automatically. i This selection is available only with 2-byte value transmitters (0 ... 40 °C).	

Increment	1, 10, 20, ..., **500**, ..., 1000
In a value adjustment, the device determines the new telegram value from the previous value and the preset step width. If the value falls below the lower limit of the adjustment range or if it exceeds the upper limit, the sensor adapts the step width of the last step automatically. i This selection is available only with 2-byte value transmitters (1000 ... 10000 K).	

Increment	1, 2, 3, ..., **50**, ..., 1500 lux
In a value adjustment, the device determines the new telegram value from the previous value and the preset step width. If the value falls below the lower limit of the adjustment range or if it exceeds the upper limit, the sensor adapts the step width of the last step automatically. i This selection is available only with 2-byte value transmitters (0 ... 1500 lux).	

Increment	**1**, 2, 4, 5, 10, 20, 25, 30, 50, 60 °
In a value adjustment, the device determines the new telegram value from the previous value and the preset step width. If the value falls below the lower limit of the adjustment range or if it exceeds the upper limit, the sensor adapts the step width of the last step automatically. i This selection is available only with 3-byte value transmitters (RGB/HSV).	

Value adjustment starts after	0.5 s after pressing the button 1 s after pressing the button 2 s after pressing the button 3 s after pressing the button **5 s** after pressing the button
This parameter determines the time from when the device starts the value adjustment after a key is pressed.	

Time between two telegrams	**0.5 s** 1 s 2 s 3 s
This parameter defines the interval at which the device transmits new telegrams during a value adjustment.	

Value adjustment with overflow	Active **Inactive**
If value adjustment is to be effected without overflow (setting "inactive") and if the device reaches the lower limit of the adjustment range or the upper limit during value adjustment, the adjustment will be stopped automatically by the sensor. If the value adjustment with overflow is programmed (setting "active") and if the device reaches the lower or the upper limit, it will transmit the value of this range limit and then add a pause the duration of which corresponds to two levels. Thereafter, the device transmits a telegram with the value of the other range limit and continues the value adjustment in the same direction.	

After the bus voltage returns	**no reaction** transmit current state Transmit value
This parameter determines the reaction after the bus voltage returns. Either no telegram, a telegram according to the current input state at the channel or a value parameterised accordingly for the set data point type | value range is transmitted on the bus. The reaction after the bus voltage returns takes place only after the parameterised "delay after bus voltage returns" expires ("General" parameter page).	

Value	**0** ... 100%
This parameter determines the object value after the bus voltage returns. It is visible only if "data point type | value range = DPT 5.001 | 0 ... 100%".	

Value	**0** ... 255
This parameter determines the object value after the bus voltage returns. It is visible only if "data point type | value range = DPT 5.010 | 0 ... 255".	

Value	**0** ... 360°
This parameter determines the object value after the bus voltage returns. It is visible only if "data point type | value range = DPT 5.003 | 0 ... 360°".	

Value	**0** ... 255%
This parameter determines the object value after the bus voltage returns. It is visible only if "data point type | value range = DPT 5.004 | 0 ... 255%".	

Value	-128...**0** ...127
This parameter determines the object value after the bus voltage returns. It is visible only if "data point type | value range = DPT 6.010 | -128 ... 127".	

Value	**0** ... 65535
This parameter determines the object value after the bus voltage returns. It is visible only if "data point type | value range = DPT 7.001 | 0 ... 65535".	

Colour temperature value	1000 ... **2700** ... 10000 K
This parameter determines the object value after the bus voltage returns. It is visible only if "data point type | value range = DPT 7.600 | 1000 ... 10000 K".	

Value	-32768 ... **0** ... 32767
This parameter determines the object value after the bus voltage returns. It is visible only if "data point type | value range = DPT 8.001 | -32768 ... 32767".	

Temperature value	0 ... **20** ... 40 °C
This parameter determines the object value after the bus voltage returns. It is visible only if "data point type | value range = DPT 9.001 | 0 ... 40 °C".	

Brightness value	0, 50 ... **300** ... 1500 lux
This parameter determines the object value after the bus voltage returns. It is visible only if "data point type | value range = DPT 9.004 | 0 ... 1500 lux".	

Colour temperature value	1000 ... **2700** ... 10000 K
This parameter determines the object value after the bus voltage returns. It is visible only if "data point type | value range = DPT 249.600 | colour temperature value + brightness".	

Brightness value	**0** ... 100%
This parameter determines the object value after the bus voltage returns. It is visible only if "data point type | value range = DPT 249.600 | colour temperature value + brightness".	

Adjustment duration in the actuator	0 ... 100 min, 0, **1** ... 59 s, 0 ... 900 ms
This parameter determines the object value after the bus voltage returns. It is visible only if "data point type | value range = DPT 249.600 | colour temperature value + brightness".	

Colour value	#000000 ... **#FFFFFF**
This parameter determines the object values of the 3-byte value transmitter (or 6-byte value transmitter), brightness value (V), saturation (S) and colour hue (H) objects after the bus voltage returns. It is visible with "data point type | value range = RGB/HSV with colour wheel sequence (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001)", "data point type | value range = RGB/HSV with brightness adjustment (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001)" and "data point type | value range = colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)". The value (RGB/HSV) is configured by means of a colour picker. With the data point type | value range "colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)", the white value is configured by means of a separate slider.	

White value	0 ... **255**
This parameter determines the object value of the white value (W) after the bus voltage returns. It is visible only if "data point type | value range = colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)".	

Disabling function	**Inactive** Active
This parameter enables the disabling function for the channel.	

At the beginning of the disabling function	**no reaction** Transmit value
Besides disabling the channel, the device can immediately react when the disabling occurs. This parameter defines the reaction of the channel at the beginning of the disabling.	

Value	**0** ... 100%
This parameter determines the object value at the beginning of the disabling. It is visible only if "data point type | value range = DPT 5.001 | 0 ... 100%".	

Value	**0** ... 255
This parameter determines the object value at the beginning of the disabling. It is visible only if "data point type | value range = DPT 5.010 | 0 ... 255".	

Value	**0** ... 360°
This parameter determines the object value at the beginning of the disabling. It is visible only if "data point type | value range = DPT 5.003 | 0 ... 360°".	

Value	**0** ... 255%
This parameter determines the object value at the beginning of the disabling. It is visible only if "data point type | value range = DPT 5.004 | 0 ... 255%".	

Value	-128...**0** ...127
This parameter determines the object value at the beginning of the disabling. It is visible only if "data point type | value range = DPT 6.010 | -128 ... 127".	

Value	**0** ... 65535
This parameter determines the object value at the beginning of the disabling. It is visible only if "data point type | value range = DPT 7.001 | 0 ... 65535".	

Colour temperature value	1000 ... **2700** ... 10000 K
This parameter determines the object value at the beginning of the disabling. It is visible only if "data point type | value range = DPT 7.600 | 1000 ... 10000 K".	

Value	-32768 ... **0** ... 32767
This parameter determines the object value at the beginning of the disabling. It is visible only if "data point type | value range = DPT 8.001 | -32768 ... 32767".	

Temperature value	0 ... **20** ... 40 °C
This parameter determines the object value at the beginning of the disabling. It is visible only if "data point type | value range = DPT 9.001 | 0 ... 40 °C".	

Brightness value	0, 50 ... **300** ... 1500 lux
This parameter determines the object value at the beginning of the disabling. It is visible only if "data point type | value range = DPT 9.004 | 0 ... 1500 lux".	

Colour temperature value	1000 ... **2700** ... 10000 K
This parameter determines the object value at the beginning of the disabling. It is visible only if "data point type | value range = DPT 249.600 | colour temperature value + brightness".	

Brightness value	**0** ... 100%
This parameter determines the object value at the beginning of the disabling. It is visible only if "data point type | value range = DPT 249.600 | colour temperature value + brightness".	

Adjustment duration in the actuator	0 ... 100 min, 0, **1** ... 59 s, 0 ... 900 ms
This parameter determines the object value at the beginning of the disabling. It is visible only if "data point type | value range = DPT 249.600 | colour temperature value + brightness".	

Colour value	#000000 ... **#FFFFFF**
This parameter determines the object values of the 3-byte value transmitter (or 6-byte value transmitter), brightness value (V), saturation (S) and colour hue (H) objects at the beginning of the disabling. It is visible with "data point type | value range = RGB/HSV with colour wheel sequence (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001)", "data point type | value range = RGB/HSV with brightness adjustment (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001)" and "data point type | value range = colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)". The value (RGB/HSV) is configured by means of a colour picker. With the data point type | value range "colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)", the white value is configured by means of a separate slider.	

White value	0 ... **255**
This parameter determines the object value of the white value (W) object at the beginning of the disabling. It is visible only if "data point type | value range = colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)".	

At the end of the disabling function	**no reaction** transmit current state Transmit value
Besides disabling the channel, the device can immediately react at the end of the disabling. This parameter defines the reaction of the channel at the end of the disabling.	

Value	**0** ... 100%
This parameter determines the object value at the end of the disabling. It is visible only if "data point type | value range = DPT 5.001 | 0 ... 100%".	

Value	**0** ... 255
This parameter determines the object value at the end of the disabling. It is visible only if "data point type | value range = DPT 5.010 | 0 ... 255".	

Value	**0** ... 360°
This parameter determines the object value at the end of the disabling. It is visible only if "data point type | value range = DPT 5.003 | 0 ... 360°".	

Value	**0** ... 255%
This parameter determines the object value at the end of the disabling. It is visible only if "data point type | value range = DPT 5.004 | 0 ... 255%".	

Value	-128...**0** ...127
This parameter determines the object value at the end of the disabling. It is visible only if "data point type | value range = DPT 6.010 | -128 ... 127".	

Value	**0** ... 65535
This parameter determines the object value at the end of the disabling. It is visible only if "data point type | value range = DPT 7.001 | 0 ... 65535".	

Colour temperature value	1000 ... **2700** ... 10000 K
This parameter determines the object value at the end of the disabling. It is visible only if "data point type | value range = DPT 7.600 | 1000 ... 10000 K".	

Value	-32768 ... **0** ... 32767
This parameter determines the object value at the end of the disabling. It is visible only if "data point type | value range = DPT 8.001 | -32768 ... 32767".	

Temperature value	0 ... **20** ... 40 °C
This parameter determines the object value at the end of the disabling. It is visible only if "data point type | value range = DPT 9.001 | 0 ... 40 °C".	

Brightness value	0, 50 ... **300** ... 1500 lux
This parameter determines the object value at the end of the disabling. It is visible only if "data point type | value range = DPT 9.004 | 0 ... 1500 lux".	

Colour temperature value	1000 ... **2700** ... 10000 K
This parameter determines the object value at the end of the disabling. It is visible only if "data point type | value range = DPT 249.600 | colour temperature value + brightness".	

Brightness value	**0** ... 100%
This parameter determines the object value at the end of the disabling. It is visible only if "data point type | value range = DPT 249.600 | colour temperature value + brightness".	

Adjustment duration in the actuator	0 ... 100 min, 0, **1** ... 59 s, 0 ... 900 ms
This parameter determines the object value at the end of the disabling. It is visible only if "data point type | value range = DPT 249.600 | colour temperature value + brightness".	

Colour value	#000000 ... **#FFFFFF**
This parameter determines the object values of the 3-byte value transmitter (or 6-byte value transmitter), brightness value (V), saturation (S) and colour hue (H) objects at the end of the disabling. It is visible with "data point type | value range = RGB/HSV with colour wheel sequence (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001)", "data point type | value range = RGB/HSV with brightness adjustment (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001)" and "data point type | value range = colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)". The value (RGB/HSV) is configured by means of a colour picker. With the data point type | value range "colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)", the white value is configured by means of a separate slider.	

White value	0 ... 255
This parameter determines the object value of the white value (W) object at the end of the disabling. It is visible only if "data point type | value range = colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)".	

Object polarity	0 = Released / 1 = Locked 1 = Released / 0 = Locked
This parameter defines the value of the disabling object at which the disabling function is active.	

13.2.6.2 Object list

The following communication objects are available in the "push-button" channel function with the parameterised "value transmitter" function. The name can be adjusted with the "Name" parameter.

Function	Name	Type	DPT	Flag
Value transmitter - 0...100%	I … - Output	1-byte	5,001	C, R, -, T, A
1-byte object for the transmission of values from 0 to 100%. These objects are visible only if "data point type | value range = DPT 5.001 | 0 ... 100%".				

Function	Name	Type	DPT	Flag
Value transmitter - 0...255	I … - Output	1-byte	5,010	C, R, -, T, A
1-byte object for the transmission of values from 0 to 255. These objects are visible only if "data point type | value range = DPT 5.010 | 0 ... 255".				

Function	Name	Type	DPT	Flag
Value transmitter - 0...360°	I … - Output	1-byte	5,003	C, R, -, T, A
1-byte object for the transmission of values from 0 to 360°. These objects are visible only if "data point type | value range = DPT 5.003 | 0 ... 360°".				

Function	Name	Type	DPT	Flag
Value transmitter - 0...255%	I … - Output	1-byte	5,004	C, R, -, T, A
1-byte object for the transmission of values from 0 to 255%. These objects are visible only if "data point type | value range = DPT 5.004 | 0 ... 255%".				

Function	Name	Type	DPT	Flag
Value transmitter - -128...127	I … - Output	1-byte	6,010	C, R, -, T, A
1-byte object for the transmission of values from -128 to 127. These objects are visible only if "data point type | value range = DPT 6.010 | -128 ... 127".				

<table>
<tr><th>Function</th><th>Name</th><th>Type</th><th>DPT</th><th>Flag</th></tr>
<tr><td>Value transmitter - 0...65535</td><td>I … - Output</td><td>2-byte</td><td>7,001</td><td>C, R, -, T, A</td></tr>
<tr><td colspan="5">2-byte object for the transmission of values from 0 to 65535.
These objects are visible only if "data point type | value range = DPT 7.001 | 0 ... 65535".</td></tr>
</table>

<table>
<tr><th>Function</th><th>Name</th><th>Type</th><th>DPT</th><th>Flag</th></tr>
<tr><td>Value transmitter - Colour temperature value</td><td>I … - Output</td><td>2-byte</td><td>7,600</td><td>C, R, -, T, A</td></tr>
<tr><td colspan="5">2-byte object for transmitting colour temperatures from 1000 to 10000 Kelvin.
These objects are visible only if "data point type | value range = DPT 7.600 | 1000 ... 10000 K".</td></tr>
</table>

<table>
<tr><th>Function</th><th>Name</th><th>Type</th><th>DPT</th><th>Flag</th></tr>
<tr><td>Value transmitter - -32768...32767</td><td>I … - Output</td><td>2-byte</td><td>8,001</td><td>C, R, -, T, A</td></tr>
<tr><td colspan="5">2-byte object for the transmission of values from -32768 to 32767.
These objects are visible only if "data point type | value range = DPT 8.001 | -32768 ... 32767".</td></tr>
</table>

<table>
<tr><th>Function</th><th>Name</th><th>Type</th><th>DPT</th><th>Flag</th></tr>
<tr><td>Value transmitter - Temperature value</td><td>I … - Output</td><td>2-byte</td><td>9,001</td><td>C, R, -, T, A</td></tr>
<tr><td colspan="5">2-byte object for transmitting temperature values from 0 to 40 °C.
These objects are visible only if "data point type | value range = DPT 9.001 | 0 ... 40 °C".</td></tr>
</table>

<table>
<tr><th>Function</th><th>Name</th><th>Type</th><th>DPT</th><th>Flag</th></tr>
<tr><td>Value transmitter - Brightness value</td><td>I … - Output</td><td>2-byte</td><td>9,004</td><td>C, R, -, T, A</td></tr>
<tr><td colspan="5">2-byte object for transmitting brightness values from 0 to 1500 Lux.
These objects are visible only if "data point type | value range = DPT 9.004 | 0 ... 1500 lux".</td></tr>
</table>

<table>
<tr><th>Function</th><th>Name</th><th>Type</th><th>DPT</th><th>Flag</th></tr>
<tr><td>Value transmitter - Colour temperature value and brightness value</td><td>I … - Output</td><td>6-byte</td><td>249,600</td><td>C, R, -, T, A</td></tr>
<tr><td colspan="5">6-byte object used to transmit a colour temperature value, a brightness value and the adjustment time in the actuator. The actuator sets the received values during the adjustment time.
These objects are visible only if "data point type | value range = DPT 249.600 | colour temperature value + brightness" applies.</td></tr>
</table>

Function	Name	Type	DPT	Flag
Value transmitter - RGB/HSV (colour wheel sequence)	I … - Output	3-byte	232,600	C, R, -, T, A
3-byte object for transmitting 3-byte colour information. These objects are visible only if "data point type | value range = RGB/HSV with colour wheel sequence (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001)".				

Function	Name	Type	DPT	Flag
Value transmitter - RGB/HSV (brightness adjustment)	I … - Output	3-byte	232,600	C, R, -, T, A
3-byte object for transmitting 3-byte colour information. These objects are visible only with data point type | value range: RGB/HSV with brightness adjustment (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001).				

Function	Name	Type	DPT	Flag
Value transmitter - RGBW	I … - Output	6-byte	251,600	C, R, -, T, A
6-byte object for transmitting 6-byte colour information. These objects are visible only with data point type | value range: colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001).				

Function	Name	Type	DPT	Flag
Value transmitter - Colour hue (H)	I … - Output	1-byte	5,003	C, R, -, T, A
1-byte object for transmitting the colour hue. These objects are visible only with data point type | value range: – - RGB/HSV with colour wheel sequence (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001) – - RGB/HSV with brightness adjustment (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001) - Colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)				

Function	Name	Type	DPT	Flag
Value transmitter - Saturation (S)	I … - Output	1-byte	5,001	C, R, -, T, A
1-byte object for transmitting the saturation. These objects are visible only with data point type | value range: – - RGB/HSV with colour wheel sequence (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001) – - RGB/HSV with brightness adjustment (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001) - Colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)				

Function	Name	Type	DPT	Flag
Value transmitter - brightness value (V)	I … - Output	1-byte	5,001	C, R, -, T, A
1-byte object for transmitting the brightness value. These objects are visible only with data point type | value range: – - RGB/HSV with colour wheel sequence (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001) – - RGB/HSV with brightness adjustment (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001) - Colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)				

Function	Name	Type	DPT	Flag
Value transmitter - White value (W)	I … - Output	1-byte	5,001	C, R, -, T, A
1-byte object for transmitting the white level. These objects are visible only with data point type | value range: colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001).				

Function	Name	Type	DPT	Flag
Value transmitter - Brightness value (V) status	I … - Input	1-byte	5,001	C, -, W, -, U
1-byte object for receiving the brightness value. These objects are only visible with the following configuration: – - Data point type | value range: RGB/HSV with brightness adjustment (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001) - "Start value" parameter = as value from brightness (V) status object				

Function	Name	Type	DPT	Flag
Value transmitter - Colour hue (H) status	I … - Input	1-byte	5,003	C, -, W, -, U
1-byte object for receiving the colour hue. These objects are only visible with the following configuration: – - Data point type | value range: RGB/HSV with colour wheel sequence (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001) - "Start value" parameter = as value from colour hue (H) status object				

Function	Name	Type	DPT	Flag
Value transmitter - RGB - Status	I … - Input	3-byte	232,600	C, -, W, -, U
3-byte object for receiving 3-byte colour information. These objects are only visible with the following configuration: – - Parameter: data point type | value range: RGB/HSV with brightness adjustment (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001), RGB/HSV with colour wheel sequence (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001). - "Start value" parameter = as value from RGB status object				

Function	Name	Type	DPT	Flag
Value transmitter - Disabling	I … - Input	1-bit	1,003	C, -, W, -, U
1-bit object for activating or deactivating the disabling function. The object polarity can be configured.				

13.2.7 Scene extension unit

In the "push-button" channel function, the push-button can be parameterised for the "scene extension unit" function. The ETS indicates up to two communication objects for the "scene extension unit" function. The parameters can be used to determine the value the "scene extension unit" object obtains when the button is pressed. Furthermore, the behaviour of the channel after the bus voltage returns can be parameterised and a disabling function activated.

In the scene extension unit function, the device calls either a parameterised scene number (1…64) or switches between two scenes if the button is briefly pressed. This makes it possible to recall scenes stored in other devices. Optionally, the channel performs a storage function if the button is pressed for a long time.

Setting options when button is pressed briefly:

– Recall scene: results in simply recalling the scene.
– Switch over scene: The input option for a second scene number (1…64) appears. The two entered scene numbers are switched to and from each time the button is briefly pressed.

Setting options when button is pressed and held:

– No reaction
– Storage function: A storage command is generated by a button actuation for more than five seconds. In the scene extension unit function, a storage telegram is in this case transmitted to the bus. The internal scene is stored. The internal scene control module will then request the current scene values for the actuator groups used from the bus.

i A button actuation lasting between one and five seconds will be discarded as invalid.

13.2.7.1 Table of parameters

The following parameters are available in the "push-button" channel function with the parameterised "scene extension unit" function.

Short button operation	**Recall scene** Switch over scene
This parameter defines the functionality of the scene extension unit. If the device is used as a scene extension unit, the scenes can either be stored in one or several other KNX devices (e. g. light scene push button sensor). When a scene is recalled, the device transmits a telegram with the respective scene number via the extension object of the button.	

Scene number	**1**...64
In accordance with the KNX standard, objects with data type 18.001 "Scene Control" can retrieve or store up to 64 scenes by their numbers. The parameter defines the scene number to be transmitted when the button is pressed. The input of the scene number is available only if "Call scene" is active in the event of the "short button actuation" command.	

First scene number	**1**...64
In accordance with the KNX standard, objects with data type 18.001 "Scene Control" can retrieve or store up to 64 scenes by their numbers. The parameter defines the scene number to be transmitted when the button is pressed. The input of the first scene number is available only if "Switch over scene" is active when the "Short button actuation" command is issued.	

Second scene number	1, **2** ... 64
In accordance with the KNX standard, objects with data type 18.001 "Scene Control" can retrieve or store up to 64 scenes by their numbers. The parameter defines the scene number to be transmitted when the button is pressed. The input of the second scene number is available only if "Switch over scene" is active when the "Short button actuation" command is issued.	

Long button operation	**No reaction** Memory function
This parameter defines the functionality of the scene extension unit. If the device is used as a scene extension unit, the scenes can either be stored in one or several other KNX devices (e. g. light scene push button sensor). With activated storage function, the device transmits a telegram with the respective scene number via the extension object of the button.	

After the bus voltage returns	**no reaction** transmit current state Recall scene
This parameter determines the reaction after the bus voltage returns. Either no telegram, a telegram according to the current input state at the channel or a parameterised scene number is transmitted on the bus according to the parameterisation. The reaction after the bus voltage returns takes place only after the parameterised "delay after bus voltage returns" expires ("General" parameter page).	

Scene number	1...64
The parameter defines here the scene number to be transmitted after the bus voltage returns.	

Disabling function	**Inactive** Active
This parameter enables the disabling function for the channel.	

At the beginning of the disabling function	**no reaction** Recall scene
Besides disabling the channel, the device can immediately react when the disabling occurs. This parameter defines the reaction of the channel at the beginning of the disabling.	

Scene number	1...64
The scene number to be transmitted at the beginning of the disabling is defined here.	

At the end of the disabling function	**no reaction** transmit current state Recall scene
Besides disabling the channel, the device can immediately react at the end of the disabling. This parameter defines the reaction of the channel at the end of the disabling.	

Scene number	1...64
The scene number to be transmitted at the end of the disabling is defined here.	

Object polarity	**0 = Released / 1 = Locked** 1 = Released / 0 = Locked
This parameter defines the value of the disabling object at which the disabling function is active.	

13.2.7.2 Object list

The following communication objects are available in the "push-button" channel function with the parameterised "scene extension unit" function. The name can be adjusted with the "Name" parameter.

Function	Name	Type	DPT	Flag
Scene extension unit - Scene number	I … - Output	1-byte	18,001	C, R, -, T, A
1-byte object for recalling, switching over or storing one of a maximum of 64 scenes at a scene push-button sensor.				

Function	Name	Type	DPT	Flag
Scene extension unit - Disabling	I … - Input	1-bit	1,003	C, -, W, -, U
1-bit object for activating or deactivating the disabling function. The object polarity can be configured.				

13.2.8 Short and long button operation

ℹ The "short and long button actuation" function replaces the "2-channel operation" function.

In the "push-button" channel function, the push-button can be parameterised for the "short and long button actuation" function. The ETS indicates up to nine communication objects for each channel for the "short and long button actuation" function. The parameters can be used to determine the values the "short and long button actuation" objects obtain when the button is pressed. Furthermore, the behaviour of the channel after the bus voltage returns can be parameterised and a disabling function activated.

The "short and long button actuation" function allows two objects to be operated with one push-button. Two different functions can be configured to transmit different telegrams.

The following functions are available for selection:

- DPT 1.001 | Switching
- DPT 2.001 | Priority control
- DPT 5.001 | 0 ... 100%
- DPT 5.010 | 0 ... 255
- DPT 5.003 | 0 ... 360°
- DPT 5.004 | 0 ... 255%
- DPT 6.010 | -128 ... 127
- DPT 7.001 | 0 ... 65535
- DPT 8.001 | -32768 ... 32767
- DPT 9.001 | 0 ... 40 °C
- DPT 9.004 | 0 ... 1500 lux
- DPT 18.001 | Call up scene (externally)
- DPT 18.001 | Switch scene (external)
- Room temperature control point
- RGB/HSV (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001)
- RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)

The object value that the device is to transmit on a button actuation can be selected depending on the selected function.

Transmission behaviour, long button actuation = object 2

With this transmission behaviour, exactly one telegram is sent each time the button is pressed.

- The device sends the telegram for object 1 if the button is pressed briefly.
- The device sends the telegram for object 2 if the button is pressed longer.

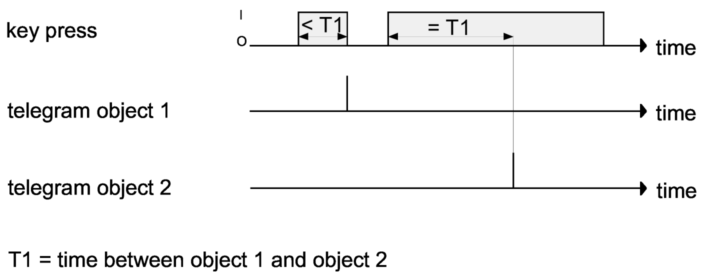

Figure 24: Example of "object 1 or object 2" operating concept

The "Long button actuation from" parameter defines the time period for distinguishing between short-time and long-time operation. If the push-button is pressed for shorter than the parameterised time, only the telegram for object 1 is transmitted on the bus. If the "long button actuation" time is exceeded by the actuation period, only the telegram for object 2 is transmitted on the bus.

i The device does not directly transmit a telegram on the bus.

Transmission behaviour, long button actuation = object 1 and object 2

With this transmission behaviour, one or alternatively two telegrams can be transmitted each time the button is pressed.

– The device will send the telegram for object 1 if the button is pressed briefly.
– The device will send the telegram for object 1 and then the telegram for object 2 if the button is pressed longer.

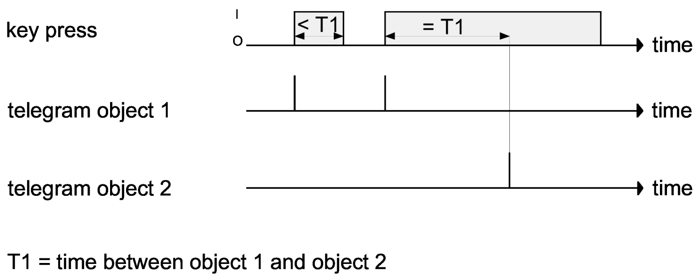

Figure 25: Example of "object 1 and object 2" operating concept

The "Long button actuation from" parameter defines the time period for distinguishing between short-time and long-time operation. The telegram for object 1 is immediately transmitted on the bus if the button is pressed. If the push-button remains pressed for the parameterised time, the telegram for object 2 is also transmitted on the bus. If the push-button is released before the time expires, no further telegram is transmitted on the bus.

i The "long button actuation from" time is to be parameterised for a sufficient period, depending on the application case, to prevent simultaneous transmission of the objects.

13.2.8.1 Table of parameters

The following parameters are available in the "push-button" channel function with the parameterised "short and long button actuation" function.

Short button operation (object 1)	no function **DPT 1.001 | Switching** DPT 2.001 | Priority control DPT 5.001 | 0 ... 100% DPT 5.010 | 0 ... 255 DPT 5.003 | 0 ... 360° DPT 5.004 | 0 ... 255% DPT 6.010 | -128 ... 127 DPT 7.001 | 0 ... 65535 DPT 7.006 | 1000 ... 10000 K DPT 8.001 | -32768 ... 32767 DPT 9.001 | 0 ... 40 °C DPT 9.004 | 0 ... 1500 lux DPT 18.001 | Call up scene (externally) DPT 18.001 | Switch scene (external) DPT 249.600 | Colour temperature value + brightness Room temperature control point RGB/HSV (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001) RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)
This parameter determines the function of the short button actuation and defines the other parameters and communication objects to be displayed.	

Function	**Operating mode switchover** Forced operating mode switchover Presence function Setpoint temperature shift
A room temperature control point can optionally switch over (force) the operating mode with normal or high priority, change the presence status or change the current room temperature setpoint value. Visible only if "short button actuation (object 1) = room temperature control point".	

Setpoint temperature shift	**by relative temperature value** by counter value
Depending on the setting of the "Target temperature shift" parameter, the shift takes place by means of the 2-byte communication object in accordance with KNX DPT 9.002 or KNX DPT 6.010. Visible only if "functionality = setpoint temperature shift".	

Long button operation (object 2)	no function **DPT 1.001 | Switching** DPT 2.001 | Priority control DPT 5.001 | 0 ... 100% DPT 5.010 | 0 ... 255 DPT 5.003 | 0 ... 360° DPT 5.004 | 0 ... 255% DPT 6.010 | -128 ... 127 DPT 7.001 | 0 ... 65535 DPT 7.006 | 1000 ... 10000 K DPT 8.001 | -32768 ... 32767 DPT 9.001 | 0 ... 40 °C DPT 9.004 | 0 ... 1500 lux DPT 18.001 | Call up scene (externally) DPT 18.001 | Switch scene (external) DPT 249.600 | Colour temperature value + brightness Room temperature control point RGB/HSV (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001) RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)
This parameter determines the function of the long button actuation and defines the other parameters and communication objects to be displayed.	

Function	**Operating mode switchover** Forced operating mode switchover Presence function Setpoint temperature shift
A room temperature control point can optionally switch over (force) the operating mode with normal or high priority, change the presence status or change the current room temperature setpoint value. Visible only if "long button actuation (object 2) = room temperature control point".	

Setpoint temperature shift	**by relative temperature value** by counter value
Depending on the setting of the "Target temperature shift" parameter, the shift takes place by means of the 2-byte communication object in accordance with KNX DPT 9.002 or KNX DPT 6.010. Visible only if "functionality = setpoint temperature shift".	

Short button operation (object 1) Long button operation (object 2)	ON OFF **TOGGLE**
This parameter defines the object value transmitted to the bus when the button is pressed. It is visible only if "function = DPT 1.001 | Switching".	

Short button operation (object 1) Long button operation (object 2)	no reaction **Switch ON with priority** Switch OFF with priority Remove priority control
This parameter defines the object value transmitted to the bus when the button is pressed. It is visible only if "functionality = DPT 2.001 | Forced position".	

Short button operation (object 1) Long button operation (object 2) Value	**0**...100 %
This parameter defines the object value transmitted to the bus when the button is pressed. It is visible only if "function = DPT 5.001 | 0 ... 100%".	

Short button operation (object 1) Long button operation (object 2) Value	**0**...255
This parameter defines the object value transmitted to the bus when the button is pressed. It is visible only if "function = DPT 5.010 | 0 ... 255".	

Short button operation (object 1) Long button operation (object 2) Value	**0**...360°
This parameter defines the object value transmitted to the bus when the button is pressed. It is visible only if "function = DPT 5.003 | 0 ... 360°".	

Short button operation (object 1) Long button operation (object 2) Value	**0**...255 %
This parameter defines the object value transmitted to the bus when the button is pressed. It is visible only if "function = DPT 5.004 | 0 ... 255%".	

Short button operation (object 1) Long button operation (object 2) Value	-128...**0**...127
This parameter defines the object value transmitted to the bus when the button is pressed. It is visible only if "function = DPT 6.010 | -128 ... 127".	

Short button operation (object 1) Long button operation (object 2) Value	**0**...65535
This parameter defines the object value transmitted to the bus when the button is pressed. It is visible only if "function = DPT 7.001 | 0 ... 65535".	

Short button operation (object 1) Long button operation (object 2) Value	1000...**2700**...10000 K
This parameter defines the object value transmitted to the bus when the button is pressed. It is visible only if "functionality = DPT 7.600 | 1000 ... 10000 K".	

Short button operation (object 1) Long button operation (object 2) Value	-32768...**0**...32767
This parameter defines the object value transmitted to the bus when the button is pressed. It is visible only if "function = DPT 8.001 | -32768 ... 32767".	

Short button operation (object 1) Long button operation (object 2) Temperature value	0...**20**...40 °C
This parameter defines the object value transmitted to the bus when the button is pressed. It is visible only if "function = DPT 9.001 | 0 ... 40 °C".	

Short button operation (object 1) Long button operation (object 2) Brightness value	0...**300**...1500 lux
This parameter defines the object value transmitted to the bus when the button is pressed. It is visible only if "function of object 1 (2) = DPT 9.004 | 0 ... 1500 lux".	

Short button operation (object 1) Long button operation (object 2) Scene number	**1**...64
This parameter defines the object value transmitted to the bus when the button is pressed. It is visible only if "function = DPT 18.001 | Recall scene (externally)".	

Short button operation (object 1) Long button operation (object 2) First scene number	**1**...64
This parameter defines the object value transmitted to the bus when the button is pressed. It is visible only if "functionality = DPT 18.001 | Switch over scene (externally)".	

Short button operation (object 1) Long button operation (object 2) Second scene number	1...**2**...64
This parameter defines the object value transmitted to the bus when the button is pressed. It is visible only if "functionality = DPT 18.001 | Switch over scene (externally)".	

Short button operation (object 1) Long button operation (object 2) Colour temperature value	1000 ... **2700** ... 10000 K
This parameter defines the object value when the button is pressed. It is visible only if "functionality = DPT 249.600 | colour temperature value + brightness".	

Short button operation (object 1) Long button operation (object 2) Brightness value	0 ... **100**%
This parameter defines the object value when the button is pressed. It is visible only if "functionality = DPT 249.600 | colour temperature value + brightness".	

Short button operation (object 1) Long button operation (object 2) Adjustment duration in the actuator	0 ... 100 min, 0, **1** ... 59 s, 0 ... 900 ms
This parameter defines the object value when the button is pressed. It is visible only if "functionality = DPT 249.600 | colour temperature value + brightness".	

Short button operation (object 1) Long button operation (object 2) Operating mode	**Comfort** Standby Night Frost/heat protection Switchover: comfort/standby Switchover: comfort/night Switchover: standby/night Switchover: comfort/standby/night
If the room temperature control point is intended to change over the operating mode of the room temperature controller with normal priority, the extension unit can either switch on a defined operating mode or switch between different operating modes when operated. Visible only if "functionality = room temperature control point -> operating mode change-over".	

Short button operation (object 1) Long button operation (object 2) Forced operating mode	Forcing inactive (auto) **Comfort** Standby Night Frost/heat protection Switchover: comfort/standby Switchover: comfort/night Switchover: standby/night Switchover: comfort/standby/night Toggle: forced inactive (auto) / comfort Toggle: forced inactive (auto) / standby Toggle: forced inactive (auto) / night Switchover: forced inactive (auto) / frost/ heat protection
If the room temperature control point is intended to switch the operating mode of the room temperature controller with high priority, the extension unit can either enable change-over with normal priority (auto), switch on a defined operating mode with high priority or switch different operating modes when operated. Visible only if "functionality = room temperature control point -> forced operating mode change-over".	

Short button operation (object 1) Long button operation (object 2)	Presence ON Presence OFF **Presence TOGGLE**
The room temperature control point can switch the presence state of the room temperature controller either on or off in a defined way or the extension unit can switch between both states ("Presence TOGGLE") by pressing the button. Visible only if "functionality = room temperature control point -> presence function".	

Short button operation (object 1) Long button operation (object 2) Setpoint temperature shift	+2 K +1.5 K +1 K **+0.5 K** -0.5 K -1 K -1.5 K -2 K
The temperature difference is defined in Kelvin here by which the setpoint temperature will be shifted up or down when the button is pressed. To shift the setpoint temperature, the room temperature control point uses the two communication objects "Setpoint temperature shift" and "Setpoint temperature shift - Status". The communication object "Setpoint temperature shift - Status" informs the room temperature control point about the current state of the room temperature controller. Based on this value and the parameter here, the room temperature control point calculates the new level value, which it transmits to the room temperature controller by means of the "setpoint temperature shift" communication object. Visible only if "Functionality = room temperature control point -> Setpoint temperature shift -> By relative temperature value".	

Short button operation (object 1) Long button operation (object 2)	**Increase setpoint temperature** Reduce setpoint temperature
The direction of the target temperature shift is defined here at the room temperature control point. To shift the setpoint temperature, the room temperature control point uses the two communication objects "Setpoint temperature shift" and "Setpoint temperature shift - Status". The communication object "Setpoint temperature shift - Status" informs the extension unit about the current state of the room temperature controller. Based on this value and the parameter here, the room temperature control point calculates the new level value, which it transmits to the room temperature controller by means of the "setpoint temperature shift" communication object. Visible only if "Functionality = room temperature control point -> Setpoint temperature shift -> By counting value".	

Short button operation (object 1) Long button operation (object 2) Colour value	**#000000** ... #FFFFFF
This parameter determines the object values of the colour hue (H), saturation (S), brightness value (V), which is transmitted to the bus when the button is pressed. It is visible if "function = RGB/HSV (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001)".	

Short button operation (object 1) Long button operation (object 2) White value	**0** ... 255
This parameter defines the object value of the white level (W) object when the button is pressed. It is visible only if "function = RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)".	

Extended settings	Active **Inactive**
This parameter enables advanced configuration options for the "short and long button actuation" function. If the advanced parameters are deactivated, the device transmits object 1 if the button is pressed briefly and object 2 if it is pressed for a long period. Pressing the button for at least 3 seconds is regarded as long. When the advanced parameters are activated, the ETS shows the following parameters.	

Transmission behaviour, long button actuation	**Object 2** Object 1 and Object 2
This parameter defines the transmission behaviour of long button actuation. Object 2: object 1 is transmitted by pressing the button briefly and object 2 is transmitted by pressing the button for a long period Object 1 and object 2: object 1 is transmitted by pressing the button briefly and object 1 and object 2 are transmitted by pressing the button for a long period	

Long button operation from	0...**3**...25 s | 0...990 ms
This parameter defines the interval at which the device transmits the telegram for object 1 and the telegram for object 2, depending on the selected transmission behaviour. A time from 100 ms to 25.5 s can be set. i The "long button actuation from" time is to be parameterised for a sufficient period, depending on the application case, to prevent simultaneous transmission of the objects.	

After the bus voltage returns Object 1 (object 2)	**no reaction** Transmit value
This parameter determines the reaction after the bus voltage returns. Either no telegram or a value parameterised according to the functionality is transmitted on the bus according to the parameterisation. The reaction after the bus voltage returns takes place only after the parameterised "delay after bus voltage returns" expires ("General" parameter page).	

Disabling function	**Inactive** Active
This parameter enables the disabling function for the channel.	

At the beginning of the disabling function Object 1 (object 2)	**no reaction** Transmit value
Besides disabling the channel, the device can immediately react when the disabling occurs. Either no telegram or a value parameterised according to the functionality is transmitted on the bus according to the parameterisation. This parameter defines the reaction of the channel at the beginning of the disabling.	

At the end of the disabling function Object 1 (object 2)	**no reaction** Transmit value
Besides disabling the channel, the device can immediately react at the end of the disabling. Either no telegram or a value parameterised according to the functionality is transmitted on the bus according to the parameterisation. This parameter defines the reaction of the channel at the end of the disabling.	

Object polarity	**0 = Released / 1 = Locked** 1 = Released / 0 = Locked
This parameter defines the value of the disabling object at which the disabling function is active.	

13.2.8.2 Object list

The following communication objects are available in the "push-button" channel function with the parameterised "short and long button actuation" function. The name can be adjusted with the "Name" parameter.

Function	Name	Type	DPT	Flag
Short and long button actuation - Object 1 - Switching	I … - Output	1-bit	1,001	C, R, -, T, A
1-bit object to send switching telegrams if the button is briefly pressed (object 1).				

Function	Name	Type	DPT	Flag
Short and long button actuation - Object 2 - Switching	I … - Output	1-bit	1,001	C, R, -, T, A
1-bit object to send switching telegrams if the button is pressed and held (object 2).				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 1 - Switching - Status	I ... - Input	1-bit	1,001	C, -, W, -, U
1-bit object for receiving feedback telegrams (ON, OFF) (object 1). This object is visible if the parameter "Short button actuation (object 1)" is parameterised to "TOGGLE".				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 2 - Switching - Status	I ... - Input	1-bit	1,001	C, -, W, -, U
1-bit object for receiving feedback telegrams (ON, OFF) (object 2). This object is visible if the parameter "Long button actuation (object 2)" is parameterised to "TOGGLE".				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 1 - Forced position	I … - Output	2-bit	2,001	C, R, -, T, A
2-bit input object for activating and deactivating the forced position (object 1). With the value "1", bit 1 of the telegram activates the forced position. The assigned channels are then locked in the state specified by bit 0 ("0" = OFF / "1" = ON). The value "0" in bit 1 deactivates the forced position again. 0x = forcing inactive 10 = forcing active, OFF 11 = forcing active, ON				

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Function	Name	Type	DPT	Flag
Short and long button operation - Object 2 - Forced position	I … - Output	2-bit	2,001	C, R, -, T, A
2-bit input object for activating and deactivating the forced position (object 1). With the value "1", bit 1 of the telegram activates the forced position. The assigned channels are then locked in the state specified by bit 0 ("0" = OFF / "1" = ON). The value "0" in bit 1 deactivates the forced position again. 0x = forcing inactive 10 = forcing active, OFF 11 = forcing active, ON				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 1 - Value 0...100%	I … - Output	1-byte	5,001	C, R, -, T, A
1-byte object to send value telegrams if the button is briefly pressed (object 1).				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 2 - Value 0...100%	I … - Output	1-byte	5,001	C, R, -, T, A
1-byte object to send value telegrams if the button is pressed and held (object 2).				

Function	Name	Type	DPT	Flag
Short and long button actuation - Object 1 - Value 0...255	I … - Output	1-byte	5,010	C, R, -, T, A
1-byte object to send value telegrams if the button is briefly pressed (object 1).				

Function	Name	Type	DPT	Flag
Short and long button actuation - Object 2 - Value 0...255	I … - Output	1-byte	5,010	C, R, -, T, A
1-byte object to send value telegrams if the button is pressed and held (object 2).				

Function	Name	Type	DPT	Flag
Short and long button actuation - Object 1 - Value 0...360°	I ... - Output	1-byte	5,003	C, R, -, T, A
1-byte object to send value telegrams if the button is briefly pressed (object 1).				

Function	Name	Type	DPT	Flag
Short and long button actuation - Object 2 - Value 0...360°	I ... - Output	1-byte	5,003	C, R, -, T, A
1-byte object to send value telegrams if the button is pressed and held (object 2).				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 1 - Value 0...255%	I ... - Output	1-byte	5,004	C, R, -, T, A
1-byte object to send value telegrams if the button is briefly pressed (object 1).				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 2 - Value 0...255%	I ... - Output	1-byte	5,004	C, R, -, T, A
1-byte object to send value telegrams if the button is pressed and held (object 2).				

Function	Name	Type	DPT	Flag
Short and long button actuation - Object 1 - Value -128...127	I ... - Output	1-byte	6,010	C, R, -, T, A
1-byte object to send value telegrams if the button is briefly pressed (object 1).				

Function	Name	Type	DPT	Flag
Short and long button actuation - Object 2 - Value -128...127	I ... - Output	1-byte	6,010	C, R, -, T, A
1-byte object to send value telegrams if the button is pressed and held (object 2).				

Function	Name	Type	DPT	Flag
Short and long button actuation - Object 1 - Value 0...65535	I ... - Output	2-byte	7,001	C, R, -, T, A
2-byte object to send value telegrams if the button is briefly pressed (object 1).				

Function	Name	Type	DPT	Flag
Short and long button actuation - Object 2 - Value 0...65535	I ... - Output	2-byte	7,001	C, R, -, T, A
2-byte object to send value telegrams if the button is pressed and held (object 2).				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 1 - Colour temperature value	I ... - Output	2-byte	7,600	C, R, -, T, A
2-byte object to send value telegrams if the button is briefly pressed (object 1).				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 2 - Colour temperature value	I ... - Output	2-byte	7,600	C, R, -, T, A
2-byte object to send value telegrams if the button is pressed and held (object 2).				

Function	Name	Type	DPT	Flag
Short and long button actuation - Object 1 - Value -32768...32767	I ... - Output	2-byte	8,001	C, R, -, T, A
2-byte object to send value telegrams if the button is briefly pressed (object 1).				

Function	Name	Type	DPT	Flag
Short and long button actuation - Object 2 - Value -32768...32767	I ... - Output	2-byte	8,001	C, R, -, T, A
2-byte object to send value telegrams if the button is pressed and held (object 2).				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 1 -Temperature value	I ... - Output	2-byte	9,001	C, R, -, T, A
2-byte object to send temperature values if the button is briefly pressed (object 1).				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 2 -Temperature value	I ... - Output	2-byte	9,001	C, R, -, T, A
2-byte object to send temperature values if the button is pressed and held (object 2).				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 1 - Brightness value	I ... - Output	2-byte	9,004	C, R, -, T, A
2-byte object to transmit brightness values if the button is briefly pressed (object 1).				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 2 - Brightness value	I ... - Output	2-byte	9,004	C, R, -, T, A
2-byte object to send brightness values if the button is pressed and held (object 2).				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 1 - Scene number 1...64	I ... - Output	1-byte	18,001	C, R, -, T, A
1-byte object to send scene values if the button is briefly pressed (object 1).				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 2 - Scene number 1...64	I ... - Output	1-byte	18,001	C, R, -, T, A
1-byte object to send scene values if the button is pressed and held (object 2).				

Function	Name	Type	DPT	Flag
Short and long button actuation - Object 1 - Colour temperature value and brightness value	I ... - Output	6-byte	249,600	C, R, -, T, A
6-byte object used to transmit a colour temperature value, a brightness value and the adjustment time in the actuator (object 1). The actuator sets the received values during the adjustment time. These objects are visible only if "Short button actuation (object 1) = DPT 249.600 | colour temperature value + brightness".				

Function	Name	Type	DPT	Flag
Short and long button actuation - Object 2 - Colour temperature value and brightness value	I ... - Output	6-byte	249,600	C, R, -, T, A
6-byte object used to transmit a colour temperature value, a brightness value and the adjustment time in the actuator (object 2). The actuator sets the received values during the adjustment time. These objects are visible only if "Long button actuation (object 2) = DPT 249.600 | colour temperature value + brightness".				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 1 - Operating mode	I ... - Output	1-byte	20,102	C, R, -, T, A
1-byte object for switching a room temperature controller between the Comfort, Standby, Night and Frost/heat protection operating modes. This object is only visible if "Function = operating mode switchover".				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 2 - Operating mode	I ... - Output	1-byte	20,102	C, R, -, T, A
1-byte object for switching a room temperature controller between the Comfort, Standby, Night and Frost/heat protection operating modes. This object is only visible if "Function = operating mode switchover".				

Function	Name	Type	DPT	Flag
Short and long button actuation - Object 1 - Operating mode - Status	I ... - Input	1-byte	20,102	C, -, W, -, U
1-byte object for receiving the operating mode of a room temperature controller. This object is only visible if "Function = operating mode switchover".				

Function	Name	Type	DPT	Flag
Short and long button actuation - Object 2 - Operating mode - Status	I ... - Input	1-byte	20,102	C, -, W, -, U
1-byte object for receiving the operating mode of a room temperature controller. This object is only visible if "Function = operating mode switchover".				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 1 - Operating mode - Forcing	I ... - Output	1-byte	20,102	C, R, -, T, A
1-byte object for switching a room temperature controller under forced control between the Automatic, Comfort, Standby, Night and Frost / heat protection operating modes. This object is only visible if "Function = forced operating mode switchover".				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 2 - Operating mode - Forcing	I ... - Output	1-byte	20,102	C, R, -, T, A
1-byte object for switching a room temperature controller under forced control between the Automatic, Comfort, Standby, Night and Frost / heat protection operating modes. This object is only visible if "Function = forced operating mode switchover".				

Function	Name	Type	DPT	Flag
Short and long button actuation - Object 1 - Operating mode - Forcing - Status	I ... - Input	1-byte	20,102	C, -, W, -, U
1-byte object for receiving the operating mode of a room temperature controller. This object is only visible if "Function = forced operating mode switchover".				

Function	Name	Type	DPT	Flag
Short and long button actuation - Object 2 - Operating mode - Forcing - Status	I ... - Input	1-byte	20,102	C, -, W, -, U
1-byte object for receiving the operating mode of a room temperature controller. This object is only visible if "Function = forced operating mode switchover".				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 1 - Presence	I ... - Output	1-bit	1,018	C, R, -, T, A
1-bit object for changing over the presence status of a room temperature controller. This object is only visible if "Function = presence function".				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 2 - Presence	I ... - Output	1-bit	1,018	C, R, -, T, A
1-bit object for changing over the presence status of a room temperature controller. This object is only visible if "Function = presence function".				

Function	Name	Type	DPT	Flag
Short and long button actuation - Object 1 - Presence - Status	I ... - Input	1-bit	1,018	C, -, W, -, U
1-bit object for receiving the presence status of a room temperature controller. This object is only visible if "Function = presence function".				

Function	Name	Type	DPT	Flag
Short and long button actuation - Object 2 - Presence - Status	I ... - Input	1-bit	1,018	C, -, W, -, U
1-bit object for receiving the presence status of a room temperature controller. This object is only visible if "Function = presence function".				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 1 - Setpoint temperature shift	I ... - Output	2-byte	9,002	C, R, -, T, A
2-byte object for specification of a target temperature shift in Kelvin. The value "0" means that no shift is active . Values can be specified between -670760 K and 670760 K. This object is visible only if "function = target temperature shift" and "type of target temperature shift = above relative temperature value".				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 2 - Setpoint temperature shift	I ... - Output	2-byte	9,002	C, R, -, T, A
2-byte object for specification of a target temperature shift in Kelvin. The value "0" means that no shift is active . Values can be specified between -670760 K and 670760 K. This object is visible only if "function = target temperature shift" and "type of target temperature shift = above relative temperature value".				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 1 - Setpoint temperature shift - Status	I ... - Input	2-byte	9,002	C, -, W, -, U
2-byte object for receiving the status of the current target temperature shift in Kelvin. This object is visible only if "function = target temperature shift" and "type of target temperature shift = above relative temperature value".				

<table>
<tr><th>Function</th><th>Name</th><th>Type</th><th>DPT</th><th>Flag</th></tr>
<tr><td>Short and long button operation - Object 2 - Setpoint temperature shift - Status</td><td>I ... - Input</td><td>2-byte</td><td>9,002</td><td>C, -, W, -, U</td></tr>
<tr><td colspan="5">2-byte object for receiving the status of the current target temperature shift in Kelvin.
This object is visible only if "function = target temperature shift" and "type of target temperature shift = above relative temperature value".</td></tr>
</table>

<table>
<tr><th>Function</th><th>Name</th><th>Type</th><th>DPT</th><th>Flag</th></tr>
<tr><td>Short and long button operation - Object 1 - Setpoint temperature shift</td><td>I ... - Output</td><td>1-byte</td><td>6,010</td><td>C, R, -, T, A</td></tr>
<tr><td colspan="5">1-byte object for specification of a target temperature shift. The value "0" means that no shift is active . The value is depicted in a two's complement in the positive or negative direction.
This object is visible only if "function = target temperature shift" and "type of target temperature shift = above meter value".</td></tr>
</table>

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<tr><th>Function</th><th>Name</th><th>Type</th><th>DPT</th><th>Flag</th></tr>
<tr><td>Short and long button operation - Object 2 - Setpoint temperature shift</td><td>I ... - Output</td><td>1-byte</td><td>6,010</td><td>C, R, -, T, A</td></tr>
<tr><td colspan="5">1-byte object for specification of a target temperature shift. The value "0" means that no shift is active . The value is depicted in a two's complement in the positive or negative direction.
This object is visible only if "function = target temperature shift" and "type of target temperature shift = above meter value".</td></tr>
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<tr><th>Function</th><th>Name</th><th>Type</th><th>DPT</th><th>Flag</th></tr>
<tr><td>Short and long button operation - Object 1 - Setpoint temperature shift - Status</td><td>I ... - Input</td><td>1-byte</td><td>6,010</td><td>C, -, W, -, U</td></tr>
<tr><td colspan="5">1-byte object to receive the status of the current target temperature shift.
This object is visible only if "function = target temperature shift" and "type of target temperature shift = above meter value".</td></tr>
</table>

Function	Name	Type	DPT	Flag
Short and long button operation - Object 2 - Setpoint temperature shift - Status	I ... - Input	1-byte	6,010	C, -, W, -, U
1-byte object to receive the status of the current target temperature shift. This object is visible only if "function = target temperature shift" and "type of target temperature shift = above meter value".				

Function	Name	Type	DPT	Flag
Short and long button actuation - Object 1 - Colour value (RGB)	I ... - Output	3-byte	232,600	C, R, -, T, A
3-byte object to send RBG values if the button is briefly pressed (object 1). This object is visible only if "colour control = combi object: RGB or combi object: RGBW" was selected.				

Function	Name	Type	DPT	Flag
Short and long button actuation - Object 2 - Colour value (RGB)	I ... - Output	3-byte	232,600	C, R, -, T, A
3-byte object to send RBG values if the button is pressed and held (object 2). This object is visible only if "colour control = combi object: RGB or combi object: RGBW" was selected.				

Function	Name	Type	DPT	Flag
Short and long button actuation - Object 1 - Colour value (RGBW)	I ... - Output	6-byte	251,600	C, R, -, T, A
6-byte object to send RBGW values if the button is briefly pressed (object 1). This object is visible only if "colour control = combi object: RGB or combi object: RGBW" was selected.				

Function	Name	Type	DPT	Flag
Short and long button actuation - Object 2 - Colour value (RGBW)	I ... - Output	6-byte	251,600	C, R, -, T, A
6-byte object to send RBGW values if the button is pressed and held (object 2). This object is visible only if "colour control = combi object: RGB or combi object: RGBW" was selected.				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 1 - Red colour value	I ... - Output	1-byte	5,001	C, R, -, T, A
1-byte object to send the red colour value if the button is briefly pressed (object 1). This object is visible only if "colour control = individual object: RGB or individual object: RGBW" was selected.				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 2 - Red colour value	I ... - Output	1-byte	5,001	C, R, -, T, A
1-byte object to send the red colour value if the button is pressed and held (object 2). This object is visible only if "colour control = individual object: RGB or individual object: RGBW" was selected.				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 1 - Green colour value	I ... - Output	1-byte	5,001	C, R, -, T, A
1-byte object to send the green colour value if the button is briefly pressed (object 1). This object is visible only if "colour control = individual object: RGB or individual object: RGBW" was selected.				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 2 - Green colour value	I ... - Output	1-byte	5,001	C, R, -, T, A
1-byte object to send the green colour value if the button is pressed and held (object 2). This object is visible only if "colour control = individual object: RGB or individual object: RGBW" was selected.				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 1 - Blue colour value	I ... - Output	1-byte	5,001	C, R, -, T, A
1-byte object to send the blue colour value if the button is briefly pressed (object 1). This object is visible only if "colour control = individual object: RGB or individual object: RGBW" was selected.				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 2 - Blue colour value	I ... - Output	1-byte	5,001	C, R, -, T, A
1-byte object to send the blue colour value if the button is pressed and held (object 2). This object is visible only if "colour control = individual object: RGB or individual object: RGBW" was selected.				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 1 - Colour hue (H)	I ... - Output	1-byte	5,003	C, R, -, T, A
1-byte object to send the colour hue if the button is briefly pressed (object 1). This object is visible only if "colour control = individual object: HSV or individual object: HSVW" was selected.				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 2 - Colour hue (H)	I ... - Output	1-byte	5,003	C, R, -, T, A
1-byte object to send the colour hue if the button is pressed and held (object 2). This object is visible only if "colour control = individual object: HSV or individual object: HSVW" was selected.				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 1 - Saturation (S)	I ... - Output	1-byte	5,001	C, R, -, T, A
1-byte object to send the saturation if the button is briefly pressed (object 1). This object is visible only if "colour control = individual object: HSV or individual object: HSVW" was selected.				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 2 - Saturation (S)	I ... - Output	1-byte	5,001	C, R, -, T, A
1-byte object to send the saturation if the button is pressed and held (object 2). This object is visible only if "colour control = individual object: HSV or individual object: HSVW" was selected.				

Function	Name	Type	DPT	Flag
Short and long button actuation - Object 1 - Brightness value (V)	I ... - Output	1-byte	5,001	C, R, -, T, A
1-byte object to send the brightness value if the button is briefly pressed (object 1). This object is visible only if "colour control = individual object: HSV or individual object: HSVW" was selected.				

Function	Name	Type	DPT	Flag
Short and long button actuation - Object 2 - Brightness value (V)	I ... - Output	1-byte	5,001	C, R, -, T, A
1-byte object to send the brightness value if the button is pressed and held (object 2). This object is visible only if "colour control = individual object: HSV or individual object: HSVW" was selected.				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 1 - White value (W)	I ... - Output	1-byte	5,001	C, R, -, T, A
1-byte object to send the white value if the button is briefly pressed (object 1). This object is visible only if "colour control = individual object: HSVW" was selected.				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 2 - White value (W)	I ... - Output	1-byte	5,001	C, R, -, T, A
1-byte object to send the white value if the button is pressed and held (object 2). This object is visible only if "colour control = individual object: HSVW" was selected.				

Function	Name	Type	DPT	Flag
Short and long button operation - Object 1/2 - Disabling	I ... - Input	1-bit	1,003	C, -, W, -, U
1-bit object for activating or deactivating the disabling function. The object polarity can be configured.				

13.2.9 Room temperature control point

In the "push-button" channel function, the push-button can be parameterised for the "room temperature control point" function. The ETS indicates up to three communication objects for the "room temperature control point" function. The parameters can be used to determine the value the "RTC control point" objects obtain when the button is pressed. Furthermore, the behaviour of the channel after the bus voltage returns can be parameterised and a disabling function activated. No distinction is made between a brief or long press.

The "room temperature control point" channel function can be used to actuate a KNX room temperature controller.

The room temperature control point itself is not involved in the temperature control process. It allows the user to operate the single-room regulation from different points in the room. The room temperature control point can also be used to control central heating control devices located, for example, in a sub-distribution unit.

Typical KNX room temperature controllers generally offer different ways of influencing the room temperature control:

– Operating mode switchover:
  Switching between different modes of operation (e. g. "Comfort", "Night" ...) with different setpoint temperatures assigned to each mode by the controller.
– Presence function:
  Signalling the presence of a person in a room. The signalling may also be combined with a configured switchover in the mode of operation.
– Setpoint temperature shift:
  Adjustment of the setpoint temperature via a temperature offset (DPT 9.002) or via levels (DPT 6.010).

The room temperature control point is operated with the button functions of the device. In this way, it is possible to completely control a room temperature controller by changing the operating mode, specifying the presence function or adjusting the target temperature shift.

13.2.9.1 Operating mode switchover

Switchover of the controller operating mode can be effected in accordance with the standard function block for room temperature controllers defined in the KNX handbook using two 1-byte communication objects. The operating mode can be switched over with the normal and with the forced objects. The object "RTC control point - Operating mode" allows different modes to be selected:

– Comfort
– Standby
– Night
– Frost/heat protection
– Switchover: comfort/standby
– Switchover: comfort/night

- Switchover: standby/night
- Switchover: comfort/standby/night

The communication object "RTC control point - Operating mode - Forcing" is of higher priority. It permits forced switching between the following modes of operation:

- Forcing inactive (auto)
- Comfort
- Standby
- Night
- Frost/heat protection
- Switchover: comfort/standby
- Switchover: comfort/night
- Switchover: standby/night
- Switchover: comfort/standby/night
- Toggle: forced inactive (auto) / comfort
- Toggle: forced inactive (auto) / standby
- Toggle: forced inactive (auto) / night
- Switchover: forced inactive (auto) / frost/heat protection

The operating mode transmitted to the bus when pressing the button of the room temperature control point is defined by the parameter "When pressed". Depending on the parameterised operating concept, either pressing a button will activate one of the above modes or each button actuation will toggle between two or three modes.

i It is recommended to visualise the state when switching over. The visualisation can take place by means of a switch setting or by a status LED, actuated, for example, via the output of the push-button interface.

13.2.9.2 Presence function

All channels whose functionality is set to "presence function" have the two communication objects "RTC control point - Presence" and "RTC control point - Presence - Status". The "When pressed" parameter determines the object value transmitted to the bus in the event of button actuation.

13.2.9.3 Setpoint temperature shift

Another function of the room temperature control point that is available is the target temperature shift. It makes use of either two 2-byte communication objects with datapoint type 9.002 or two 1-byte communication objects with datapoint type 6.010 (integer with sign).

This control point function allows the basic setpoint for the temperature to be shifted on a room temperature controller by pressing a button. The control point is usually operated in the same way as the main control point. A button configured as target temperature shift reduces or increases the target temperature shift value each time the button is pressed. The direction of the value adjustment is defined by the parameters "Increase setpoint temperature difference when pressed" or "Reduce setpoint temperature difference when pressed".

Communication with main controller

To enable the device to shift the target temperature on a room temperature controller, the controller must have input and output objects for the target temperature shift. In this case, the output object of the controller must be connected to the input object of the room temperature control point, and the input object of the controller must be connected to the output object of the room temperature control point in each case via their own group address.

All objects are of the same datapoint type and have the same value range. A target temperature shift is interpreted by count values: a shift in positive direction is expressed by positive values, whereas a shift in negative direction is represented by negative object values. An object value of "0" means that no target temperature shift has been set.

The room temperature control points detect the current position of the setpoint adjustment by means of the object "RTC control point - Target temperature shift - Status" of the room temperature control point connected to the room temperature controller. Starting from the value of the communication object, the setpoint is adjusted in the configured direction each time a button is pressed on a room temperature control point. Each time the setpoint is adjusted, the new shift by means of the object "RTC control point - Target temperature shift" of the room temperature control point is sent to the room temperature regulator.

With the "by counter value" function, the individual levels are weighted by the controller itself.

This requires that the respective communication objects are connected to all room temperature control points and the controller. The feedback information from the controller enables the room temperature control point to continue the adjustment at any time at the right point.

13.2.9.4 Table of parameters

The following parameters are available in the "push-button" channel function with the parameterised "room temperature control point" function.

Function	**Operating mode switchover** Forced operating mode switchover Presence function Setpoint temperature shift
A room temperature control point can optionally switch over (force) the operating mode with normal or high priority, change the presence status or change the current room temperature setpoint value. With regard to the setting of this parameter, the ETS shows further parameters.	

When pressed	**Comfort** Standby Night Frost/heat protection Switchover: comfort/standby Switchover: comfort/night Switchover: standby/night Switchover: comfort/standby/night
If the room temperature control point is intended to change over the operating mode of the room temperature controller with normal priority, the extension unit can either switch on a defined operating mode or switch between different operating modes when operated.	

When pressed	Forcing inactive (auto) **Comfort** Standby Night Frost/heat protection Switchover: comfort/standby Switchover: comfort/night Switchover: standby/night Switchover: comfort/standby/night Toggle: forced inactive (auto) / comfort Toggle: forced inactive (auto) / standby Toggle: forced inactive (auto) / night Switchover: forced inactive (auto) / frost/ heat protection
If the room temperature control point is intended to switch the operating mode of the room temperature controller with high priority, the extension unit can either enable change-over with normal priority (auto), switch on a defined operating mode with high priority or switch different operating modes when operated.	

When pressed	Presence ON Presence OFF **Presence TOGGLE**
The room temperature control point can switch the presence state of the room temperature controller either on or off in a defined way or the extension unit can switch between both states ("Presence TOGGLE") by pressing the button. This parameter is only visible if "Function = presence function".	

Setpoint temperature shift	**by relative temperature value** By meter value
Depending on the setting of the "Target temperature shift" parameter, the shift takes place by means of the 2-byte communication object in accordance with KNX DPT 9.002 or KNX DPT 6.010. This parameter is visible only if "function = target temperature shift".	

When pressed	+2 K +1.5 K +1 K **+0.5 K** -0.5 K -1 K -1.5 K -2 K

The temperature difference is defined in Kelvin here by which the setpoint temperature will be shifted up or down when the button is pressed.
To shift the target temperature value, the room temperature control point uses the two communication objects "RTC control point - Target temperature shift" and "RTC control point - Target temperature shift - Status".
The communication object "RTC control point - Target temperature shift - Status" informs the room temperature control point about the current state of the room temperature controller. Based on this value and the parameter here, the room temperature control point calculates the new level value, which it sends to the room temperature controller via the communication object "RTC control point - Target temperature shift".

This parameter is visible only if "function = target temperature shift" and "type of target temperature shift = above relative temperature value".

When pressed	Increase setpoint temperature **Reduce setpoint temperature**

The direction of the target temperature shift is defined here at the room temperature control point.
To shift the target temperature value, the room temperature control point uses the two communication objects "RTC control point - Target temperature shift" and "RTC control point - Target temperature shift - Status".
The communication object "RTC control point - Target temperature shift - Status" informs the extension unit about the current state of the room temperature controller. Based on this value and the parameter here, the room temperature control point calculates the new level value, which it sends to the room temperature controller via the communication object "RTC control point - Target temperature shift".

This parameter is visible only if "function = target temperature shift" and "type of target temperature shift = above meter value".

After the bus voltage returns	**no reaction** transmit current state Comfort Standby Night Frost/heat protection

This parameter determines the reaction after the bus voltage returns.

Either no telegram, a telegram according to the current input state at the channel, a comfort telegram, a standby telegram, a night telegram or a frost/heat protection telegram is transmitted on the bus according to the parameterisation.

The reaction after the bus voltage returns takes place only after the parameterised "delay after bus voltage returns" expires ("General" parameter page).

Visible only if "Functionality = operating mode change-over".

After the bus voltage returns	**no reaction** transmit current state Forcing inactive (auto) Comfort Standby Night Frost/heat protection

This parameter determines the reaction after the bus voltage returns.

Either no telegram, a telegram according to the current input state at the channel, a forcing inactive (auto) telegram, a comfort telegram, a standby telegram, a night telegram or a frost/heat protection telegram is transmitted on the bus according to the parameterisation.

The reaction after the bus voltage returns takes place only after the parameterised "delay after bus voltage returns" expires ("General" parameter page).

Visible only if "Functionality = forced operating mode change-over".

After the bus voltage returns	**no reaction** transmit current state Presence ON Presence OFF Presence TOGGLE

This parameter determines the reaction after the bus voltage returns.

Either no telegram, a telegram according to the current input state at the channel or a presence telegram is transmitted on the bus according to the parameterisation.

The reaction after the bus voltage returns takes place only after the parameterised "delay after bus voltage returns" expires ("General" parameter page).

This parameter is only visible if "Function = presence function".

After the bus voltage returns	**no reaction** +2 K +1.5 K +1 K +0.5 K -0.5 K -1 K -1.5 K -2 K
This parameter determines the reaction after the bus voltage returns. Either no telegram or a temperature value telegram is transmitted on the bus according to the parameterisation. The reaction after the bus voltage returns takes place only after the parameterised "delay after bus voltage returns" expires ("General" parameter page). This parameter is visible only if "function = target temperature shift" and "type of target temperature shift = above relative temperature value".	

After the bus voltage returns	**no reaction** Increase setpoint temperature Reduce setpoint temperature
This parameter determines the reaction after the bus voltage returns. Either no telegram or a counting value telegram is transmitted on the bus according to the parameterisation. The reaction after the bus voltage returns takes place only after the parameterised "delay after bus voltage returns" expires ("General" parameter page). This parameter is visible only if "function = target temperature shift" and "type of target temperature shift = above meter value".	

Disabling function	**Inactive** Active
This parameter enables the disabling function for the channel.	

At the beginning of the disabling function	**no reaction** Comfort Standby Night Frost/heat protection
Besides disabling the channel, the device can immediately react when the disabling occurs. This parameter defines the reaction of the channel at the beginning of the disabling. Visible only if "Functionality = operating mode change-over".	

At the beginning of the disabling function	no reaction Forcing inactive (auto) Comfort Standby Night Frost/heat protection
Besides disabling the channel, the device can immediately react when the disabling occurs. This parameter defines the reaction of the channel at the beginning of the disabling. Visible only if "Functionality = forced operating mode change-over".	

At the beginning of the disabling function	no reaction Presence ON Presence OFF Presence TOGGLE
Besides disabling the channel, the device can immediately react when the disabling occurs. This parameter defines the reaction of the channel at the beginning of the disabling. This parameter is only visible if "Function = presence function".	

At the beginning of the disabling function	no reaction +2 K +1.5 K +1 K +0.5 K -0.5 K -1 K -1.5 K -2 K
Besides disabling the channel, the device can immediately react when the disabling occurs. This parameter defines the reaction of the channel at the beginning of the disabling. This parameter is visible only if "function = target temperature shift" and "type of target temperature shift = above relative temperature value".	

At the beginning of the disabling function	no reaction Increase setpoint temperature Reduce setpoint temperature
Besides disabling the channel, the device can immediately react when the disabling occurs. This parameter defines the reaction of the channel at the beginning of the disabling. This parameter is visible only if "function = target temperature shift" and "type of target temperature shift = above meter value".	

At the end of the disabling function	no reaction transmit current state Comfort Standby Night Frost/heat protection
Besides disabling the channel, the device can immediately react at the end of the disabling. This parameter defines the reaction of the channel at the end of the disabling. Visible only if "Functionality = operating mode change-over".	

At the end of the disabling function	no reaction transmit current state Forcing inactive (auto) Comfort Standby Night Frost/heat protection
Besides disabling the channel, the device can immediately react at the end of the disabling. This parameter defines the reaction of the channel at the end of the disabling. Visible only if "Functionality = forced operating mode change-over".	

At the end of the disabling function	no reaction transmit current state Presence ON Presence OFF Presence TOGGLE
Besides disabling the channel, the device can immediately react at the end of the disabling. This parameter defines the reaction of the channel at the end of the disabling. This parameter is only visible if "Function = presence function".	

At the end of the disabling function	**no reaction** +2 K +1.5 K +1 K +0.5 K -0.5 K -1 K -1.5 K -2 K

Besides disabling the channel, the device can immediately react at the end of the disabling.

This parameter defines the reaction of the channel at the end of the disabling.

This parameter is visible only if "function = target temperature shift" and "type of target temperature shift = above relative temperature value".

At the end of the disabling function	**no reaction** Increase setpoint temperature Reduce setpoint temperature

Besides disabling the channel, the device can immediately react at the end of the disabling.

This parameter defines the reaction of the channel at the end of the disabling.

This parameter is visible only if "function = target temperature shift" and "type of target temperature shift = above meter value".

Object polarity	**0 = Released / 1 = Locked** 1 = Released / 0 = Locked

This parameter defines the value of the disabling object at which the disabling function is active.

13.2.9.5 Object list

The following communication objects are available in the "push-button" channel function with the parameterised "room temperature control point" function. The name can be adjusted with the "Name" parameter.

Function	Name	Type	DPT	Flag
RTC control point - Operating mode	I … - Output	1-byte	20,102	C, R, -, T, A
1-byte object for switching a room temperature controller between the Comfort, Standby, Night and Frost/heat protection operating modes. This object is only visible if "Function = operating mode switchover".				

Function	Name	Type	DPT	Flag
RTC control point - Operating mode - Status	I … - Input	1-byte	20,102	C, -, W, -, U
1-byte object for receiving the operating mode of a room temperature controller. This object is only visible if "Function = operating mode switchover".				

Function	Name	Type	DPT	Flag
RTC control point - Operating mode - Forced	I … - Output	1-byte	20,102	C, R, -, T, A
1-byte object for switching a room temperature controller under forced control between the Automatic, Comfort, Standby, Night and Frost / heat protection operating modes. This object is only visible if "Function = forced operating mode switchover".				

Function	Name	Type	DPT	Flag
RTC control point - Operating mode - Forced - Status	I … - Input	1-byte	20,102	C, -, W, -, U
1-byte object for receiving the operating mode of a room temperature controller. This object is only visible if "Function = forced operating mode switchover".				

Function	Name	Type	DPT	Flag
Presence	I … - Output	1-bit	1,018	C, R, -, T, A
1-bit object for changing over the presence status of a room temperature controller. This object is only visible if "Function = presence function".				

Function	Name	Type	DPT	Flag
RTC control point - Presence - Status	I … - Input	1-bit	1,018	C, -, W, -, U
1-bit object for receiving the presence status of a room temperature controller. This object is only visible if "Function = presence function".				

Function	Name	Type	DPT	Flag
Setpoint shift	I … - Output	2-byte	9,002	C, R, -, T, A
2-byte object for specification of a target temperature shift in Kelvin. The value "0" means that no shift is active . Values can be specified between -670760 K and 670760 K. This object is visible only if "function = target temperature shift" and "type of target temperature shift = above relative temperature value".				

Function	Name	Type	DPT	Flag
Setpoint shift status	I … - Input	2-byte	9,002	C, -, W, -, U
2-byte object for receiving the status of the current target temperature shift in Kelvin. This object is visible only if "function = target temperature shift" and "type of target temperature shift = above relative temperature value".				

Function	Name	Type	DPT	Flag
Setpoint shift	I … - Output	1-byte	6,010	C, R, -, T, A
1-byte object for specification of a target temperature shift. The value "0" means that no shift is active . The value is depicted in a two's complement in the positive or negative direction. This object is visible only if "function = target temperature shift" and "type of target temperature shift = above meter value".				

Function	Name	Type	DPT	Flag
Setpoint shift status	I … - Input	1-byte	6,010	C, -, W, -, U
1-byte object to receive the status of the current target temperature shift. This object is visible only if "function = target temperature shift" and "type of target temperature shift = above meter value".				

Function	Name	Type	DPT	Flag
Lock	I … - Input	1-bit	1,003	C, -, W, -, U
1-bit object for activating or deactivating the disabling function. The object polarity can be configured.				

13.3 Switch

The "switch" channel function can be parametrised for each input. The following functions are available for each output object in the "switch" channel function:

- Switching
- Priority control
- Value transmitter
- Scene extension unit
- Room temperature control point

The ETS provides the corresponding parameters and communication objects dynamically for the function according to the parameterised function.

The debouncing time is to be parameterised separately for each channel. One or two output objects can be parameterised and actuated in the "switch" channel function. The available functions can be selected and combined independently of each other for both output objects. A disabling function can be activated optionally for each switch channel output object.

A command can be parameterised when closing and when opening the contact for each switch channel output object.

i The "switch" channel function is recommended if telegrams are to be transmitted cyclically on the KNX. This allows monitoring, similar to the heartbeat, to be implemented or rising and falling edges - like with the switch - to be evaluated regardless of the time.

13.3.1 Table of parameters

The following parameters are generally available for the "switch" channel function.

Number of objects	1 2
This parameter defines the number of output objects actuated in the "switch" channel function for each channel.	

Debounce time	4 ... 10 ... 255 ms
This parameter specifies the software debouncing time. A signal edge is evaluated at the input after a delay based on this time.	

The following parameters are available for each output object for the "switch" channel function.

Function	**Switching** Priority control Value transmitter Scene extension unit Room temperature control point
This parameter determines the function of the switch connected to the channel for each output object.	

13.3.2 Switching

In the "switch" channel function, each object of the switch can be parameterised separately for the "switching" function. The ETS indicates up to three communication objects for each switch channel output object for the "switching" function. The parameters can be used to determine which value the "switch" object receives when the contact is closed or opened. Furthermore, the behaviour of the switch channel output object after the bus voltage returns can be parameterised and a disabling function activated. The switching status of the switch channel output objects can be transmitted cyclically on the bus. No distinction is made between a brief or long press.

13.3.2.1 Table of parameters

The following parameters are available in the "switch" channel function with the parameterised "switching" function for each switch channel output object.

<table>
<tr><td>When closing the contact</td><td>no reaction
ON
OFF
TOGGLE</td></tr>
<tr><td colspan="2">This parameter determines the reaction when closing the contact of the switch.
With "TOGGLE", the ETS application program makes the status object available.</td></tr>
</table>

<table>
<tr><td>When opening the contact</td><td>no reaction
ON
OFF
TOGGLE</td></tr>
<tr><td colspan="2">This parameter determines the reaction when opening the contact of the switch.
With "TOGGLE", the ETS application program makes the status object available.</td></tr>
</table>

<table>
<tr><td>After the bus voltage returns</td><td>**no reaction**
transmit current state
ON
OFF</td></tr>
<tr><td colspan="2">This parameter determines the reaction after the bus voltage returns.
Either no telegram, a telegram according to the current input state at the channel, an ON telegram or an OFF telegram is transmitted on the bus according to the parameterisation.
The reaction after the bus voltage returns takes place only after the parameterised "delay after bus voltage returns" expires ("General" parameter page).</td></tr>
</table>

Send switching status cyclically	**Inactive** Active
The switching status of the switch channel output objects can be transmitted cyclically on the bus. This parameter enables the cyclical transmission.	

Cycle time	**0**...24 h | 0...**5**...59 min | **0**...59 s
This parameter defines the interval at which the switching status is transmitted on the bus. The cycle time can be parameterised between 3 seconds and 24 hours.	

Disabling function	**Inactive** Active
This parameter enables the disabling function for the channel.	

At the beginning of the disabling function	**no reaction** ON OFF TOGGLE
Besides disabling the channel, the device can immediately react when the disabling occurs. This parameter defines the reaction of the channel at the beginning of the disabling. i With "TOGGLE", the feedback of an actuator is to be connected with the "switching" object if the status object is not already made available by the settings of the parameter "When closing the contact" or "When opening the contact".	

At the end of the disabling function	**no reaction** transmit current state ON OFF TOGGLE
Besides disabling the channel, the device can immediately react at the end of the disabling. This parameter defines the reaction of the channel at the end of the disabling. i With "TOGGLE", the feedback of an actuator is to be connected with the "switching" object if the status object is not already made available by the settings of the parameter "When closing the contact" or "When opening the contact".	

Object polarity	**0 = Released / 1 = Locked** 1 = Released / 0 = Locked
This parameter defines the value of the disabling object at which the disabling function is active.	

13.3.2.2 Object list

The following communication objects are available in the "switch" channel function with the parameterised "switching" function. The name can be adjusted with the "Name" parameter.

Function	Name	Type	DPT	Flag
Object 1 - Switching	I … - Output	1-bit	1,001	C, R, -, T, A

1-bit object for transmission of switching telegrams (ON, OFF). This is object 1 of the parameterised output objects.

i With "TOGGLE", the feedback of an actuator is to be connected with the "switching" object if the status object is not already made available by the settings of the parameter "When closing the contact" or "When opening the contact".

Function	Name	Type	DPT	Flag
Object 1 - Switching - Status	I … - Input	1-bit	1,001	C, -, W, -, U

1-bit object for receiving feedback telegrams (ON, OFF). This is object 1 of the parameterised output objects.

This object is visible if the "When closing the contact" or "When opening the contact" parameter is parameterised to "TOGGLE".

Function	Name	Type	DPT	Flag
Object 1 - Switching - Disabling	I … - Input	1-bit	1,003	C, -, W, -, U

1-bit object for activating or deactivating the disabling function. The object polarity can be configured. This is object 1 of the parameterised output objects.

Function	Name	Type	DPT	Flag
Object 2 - Switching	I … - Output	1-bit	1,001	C, R, -, T, A

1-bit object for transmission of switching telegrams (ON, OFF). This is object 2 of the parameterised output objects.

i With "TOGGLE", the feedback of an actuator is to be connected with the "switching" object if the status object is not already made available by the settings of the parameter "When closing the contact" or "When opening the contact".

Function	Name	Type	DPT	Flag
Object 2 - Switching - Status	I … - Input	1-bit	1,001	C, -, W, -, U

1-bit object for receiving feedback telegrams (ON, OFF). This is object 2 of the parameterised output objects.

This object is visible if the "When closing the contact" or "When opening the contact" parameter is parameterised to "TOGGLE".

Function	Name	Type	DPT	Flag
Object 2 - Switching - Disabling	I … - Input	1-bit	1,003	C, -, W, -, U
1-bit object for activating or deactivating the disabling function. The object polarity can be configured. This is object 2 of the parameterised output objects.				

13.3.3 Priority control

In the "switch" channel function, each object of the switch can be parameterised separately for the "forced position" function. The ETS indicates up to two communication objects for each switch channel output object for the "forced position" function. The parameters can be used to determine which value the "forced position" object receives when the contact is closed or opened. Furthermore, the behaviour of the switch channel output object after the bus voltage returns can be parameterised and a disabling function activated. The switching status of the switch channel output objects can be transmitted cyclically on the bus. No distinction is made between a brief or long press.

i A forced position can be used as a superordinate, prioritised function. A forced position is recommended for load management or in service mode.

13.3.3.1 Table of parameters

The following parameters are available in the "switch" channel function with the parameterised "forced position" function for each switch channel output object.

When closing the contact	no reaction **Switch ON with priority** Switch OFF with priority Remove priority control
This parameter determines the reaction when closing the contact of the switch.	

When opening the contact	no reaction Switch ON with priority **Switch OFF with priority** Remove priority control
This parameter determines the reaction when opening the contact of the switch.	

After the bus voltage returns	**no reaction** transmit current state Switch ON with priority Switch OFF with priority Remove priority control
This parameter determines the reaction after the bus voltage returns. Either no telegram, a telegram according to the current input state at the channel, a forcing active ON telegram, a forcing active OFF telegram or a forcing inactive telegram is transmitted on the bus according to the parameterisation. The reaction after the bus voltage returns takes place only after the parameterised "delay after bus voltage returns" expires ("General" parameter page).	

Send switching status cyclically	**Inactive** Active
The switching status of the switch channel output objects can be transmitted cyclically on the bus. This parameter enables the cyclical transmission.	

Cycle time	**0**...24 h | 0...**5**...59 min | **0**...59 s
This parameter defines the interval at which the switching status is transmitted on the bus. The cycle time can be parameterised between 3 seconds and 24 hours.	

Disabling function	**Inactive** Active
This parameter enables the disabling function for the channel.	

At the beginning of the disabling function	**no reaction** Switch ON with priority Switch OFF with priority Remove priority control
Besides disabling the channel, the device can immediately react when the disabling occurs. This parameter defines the reaction of the channel at the beginning of the disabling.	

At the end of the disabling function	**no reaction** transmit current state Switch ON with priority Switch OFF with priority Remove priority control
Besides disabling the channel, the device can immediately react at the end of the disabling. This parameter defines the reaction of the channel at the end of the disabling.	

Object polarity	**0 = Released / 1 = Locked** 1 = Released / 0 = Locked
This parameter defines the value of the disabling object at which the disabling function is active.	

13.3.3.2 Object list

The following communication objects are available in the "switch" channel function with the parameterised "forced position" function. The name can be adjusted with the "Name" parameter.

Function	Name	Type	DPT	Flag
Object 1 - Forced position	I … - Output	2-bit	2,001	C, R, -, T, A
2-bit input object for activating and deactivating the forced position. With the value "1", bit 1 of the telegram activates the forced position. The assigned channels are then locked in the state specified by bit 0 ("0" = OFF / "1" = ON). The value "0" in bit 1 deactivates the forced position again. This is object 1 of the parameterised output objects. 0x = forcing inactive 10 = forcing active, OFF 11 = forcing active, ON				

Function	Name	Type	DPT	Flag
Object 1 - Forced position - Disabling	I … - Input	1-bit	1,003	C, -, W, -, U
1-bit object for activating or deactivating the disabling function. The object polarity can be configured. This is object 1 of the parameterised output objects.				

Function	Name	Type	DPT	Flag
Object 2 - Forced position	I … - Output	2-bit	2,001	C, R, -, T, A
2-bit input object for activating and deactivating the forced position. With the value "1", bit 1 of the telegram activates the forced position. The assigned channels are then locked in the state specified by bit 0 ("0" = OFF / "1" = ON). The value "0" in bit 1 deactivates the forced position again. This is object 2 of the parameterised output objects. 0x = forcing inactive 10 = forcing active, OFF 11 = forcing active, ON				

Function	Name	Type	DPT	Flag
Object 2 - Forced position - Disabling	I … - Input	1-bit	1,003	C, -, W, -, U
1-bit object for activating or deactivating the disabling function. The object polarity can be configured. This is object 2 of the parameterised output objects.				

13.3.4 Value transmitter

In the "switch" channel function, each object of the switch can be parameterised separately for the "value transmitter" function. The ETS indicates up to six communication objects for each switch channel output object for the "value transmitter" function. The parameters can be used to determine which value the "value transmitter" objects receive when the contact is closed or opened.

Furthermore, the behaviour of the switch channel output object after the bus voltage returns can be parameterised and a disabling function activated. The value status of the switch channel output objects can be transmitted cyclically on the bus. No distinction is made between a brief or long press.

The "value transmitter" function is used by the device to transmit parameterised values on the bus when closing and opening the contact.

Value ranges

The value transmitter knows 13 different value ranges. The parameter "Data point type | Value range" determines the value range used by the value transmitter, depending on the application case:

Function	Function	Lower numerical limit	Upper numerical limit
1-byte value transmitter	0...100%	0%	100%
1-byte value transmitter	0...255	0	255
1-byte value transmitter	0…360°	0°	360°
1-byte value transmitter	0...255%	0%	255%
1-byte value transmitter	-128...127	-128	127
2-byte value transmitter	0...65535	0	65535
2-byte value transmitter	Colour temperature value	1000 K	10000 K
2-byte value transmitter	-32768...32767	-32768	32767
2-byte value transmitter	Temperature value	0 °C	40 °C
2-byte value transmitter	Brightness value	0 lux	1500 lux
6-byte value transmitter	Colour temperature value + brightness	1000 K | 0%	10000 K | 100%
3-byte value transmitter	RGB/HSV	#000000	#FFFFFF

Function	Function	Lower numerical limit	Upper numerical limit
6-byte value transmitter	Colour value RGBW/HSVW	#000000 + 0	#FFFFFF + 255

The value that can be transmitted on the bus when closing and/or opening the contact can be parameterised for each of these ranges.

13.3.4.1 Table of parameters

The following parameters are available in the "switch" channel function with the parameterised "value transmitter" function for each switch channel output object.

Data point type | Value range	DPT 5.001 | 0 ... 100% **DPT 5.010 | 0 ... 255** DPT 5.003 | 0 ... 360° DPT 5.004 | 0 ... 255% DPT 6.010 | -128 ... 127 DPT 7.001 | 0 ... 65535 DPT 7.600 | 1000 ... 10000 K DPT 8.001 | -32768 ... 32767 DPT 9.001 | 0 ... 40 °C DPT 9.004 | 0 ... 1500 lux DPT 249.600 | Colour temperature value + brightness RGB/HSV (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001) Colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)
The "value transmitter" function distinguishes between 1-byte, 2-byte 3-byte and 6-byte values. The following parameters and their settings depend on the setting for this parameter.	

When closing the contact	no reaction **Transmit value**
This parameter determines the reaction when closing the contact of the switch. Transmit value: The ETS displays a suitable input field where the value can be entered according to the set "data point type | value range".	

When opening the contact	**no reaction** Transmit value
This parameter determines the reaction when opening the contact of the switch. Transmit value: The ETS displays a suitable input field where the value can be entered according to the set "data point type | value range".	

Value	**0** ... 100%
This parameter determines the object value when closing or opening the contact. It is visible only if "data point type | value range = DPT 5.001 | 0 ... 100%".	

Value	**0** ... 255
This parameter determines the object value when closing or opening the contact. It is visible only if "data point type | value range = DPT 5.010 | 0 ... 255".	

Value	**0** ... 360°
This parameter determines the object value when closing or opening the contact. It is visible only if "data point type | value range = DPT 5.003 | 0 ... 360°".	

Value	**0** ... 255%
This parameter determines the object value when closing or opening the contact. It is visible only if "data point type | value range = DPT 5.004 | 0 ... 255%".	

Value	-128...**0** ...127
This parameter determines the object value when closing or opening the contact. It is visible only if "data point type | value range = DPT 6.010 | -128 ... 127".	

Value	**0** ... 65535
This parameter determines the object value when closing or opening the contact. It is visible only if "data point type | value range = DPT 7.001 | 0 ... 65535".	

Colour temperature value	1000 ... **2700** ... 10000 K
This parameter determines the object value when closing or opening the contact. It is visible only if "data point type | value range = DPT 7.600 | 1000 ... 10000 K".	

Value	-32768 ... **0** ... 32767
This parameter determines the object value when closing or opening the contact. It is visible only if "data point type | value range = DPT 8.001 | -32768 ... 32767".	

Temperature value	0 ... **20** ... 40 °C
This parameter determines the object value when closing or opening the contact. It is visible only if "data point type | value range = DPT 9.001 | 0 ... 40 °C".	

Brightness value	0, 50 ... **300** ... 1500 lux
This parameter determines the object value when closing or opening the contact. It is visible only if "data point type | value range = DPT 9.004 | 0 ... 1500 lux".	

Colour temperature value	1000 ... **2700** ... 10000 K
This parameter determines the object value when closing or opening the contact. It is visible only if "data point type | value range = DPT 249.600 | colour temperature value + brightness".	

Brightness value	**0** ... 100%
This parameter determines the object value when closing or opening the contact. It is visible only if "data point type | value range = DPT 249.600 | colour temperature value + brightness".	

Adjustment duration in the actuator	0 ... 100 min, 0, **1** ... 59 s, 0 ... 900 ms
This parameter determines the object value when closing or opening the contact. It is visible only if "data point type | value range = DPT 249.600 | colour temperature value + brightness".	

Colour value	#000000 ... **#FFFFFF**
This parameter determines the object values of the 3-byte value transmitter (or 6-byte value transmitter), brightness value (V), saturation (S) and colour hue (H) objects when closing or opening the contact. It is visible with "data point type | value range = RGB/HSV with colour wheel sequence (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001)", "data point type | value range = RGB/HSV with brightness adjustment (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001)" and "data point type | value range = colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)". The value (RGB/HSV) is configured by means of a colour picker. With the data point type | value range "colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)", the white value is configured by means of a separate slider.	

White value when pressed	0 ... **255**
This parameter determines the object value of the white value (W) object when closing or opening the contact. It is visible only if "data point type | value range = colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)".	

After the bus voltage returns	**no reaction** transmit current state Transmit value
This parameter determines the reaction after the bus voltage returns. Either no telegram, a telegram according to the current input state at the channel or a value parameterised accordingly for the set data point type | value range is transmitted on the bus. The reaction after the bus voltage returns takes place only after the parameterised "delay after bus voltage returns" expires ("General" parameter page).	

Value	**0** ... 100%
This parameter determines the object value after the bus voltage returns. It is visible only if "data point type | value range = DPT 5.001 | 0 ... 100%".	

Value	**0** ... 255
This parameter determines the object value after the bus voltage returns. It is visible only if "data point type | value range = DPT 5.010 | 0 ... 255".	

Value	**0** ... 360°
This parameter determines the object value after the bus voltage returns. It is visible only if "data point type | value range = DPT 5.003 | 0 ... 360°".	

Value	**0** ... 255%
This parameter determines the object value after the bus voltage returns. It is visible only if "data point type | value range = DPT 5.004 | 0 ... 255%".	

Value	-128...**0** ...127
This parameter determines the object value after the bus voltage returns. It is visible only if "data point type | value range = DPT 6.010 | -128 ... 127".	

Value	**0** ... 65535
This parameter determines the object value after the bus voltage returns. It is visible only if "data point type | value range = DPT 7.001 | 0 ... 65535".	

Colour temperature value	1000 ... **2700** ... 10000 K
This parameter determines the object value after the bus voltage returns. It is visible only if "data point type | value range = DPT 7.600 | 1000 ... 10000 K".	

Value	-32768 ... **0** ... 32767
This parameter determines the object value after the bus voltage returns. It is visible only if "data point type | value range = DPT 8.001 | -32768 ... 32767".	

Temperature value	0 ... **20** ... 40 °C
This parameter determines the object value after the bus voltage returns. It is visible only if "data point type | value range = DPT 9.001 | 0 ... 40 °C".	

Brightness value	0, 50 ... **300** ... 1500 lux
This parameter determines the object value after the bus voltage returns. It is visible only if "data point type | value range = DPT 9.004 | 0 ... 1500 lux".	

Colour temperature value	1000 ... **2700** ... 10000 K
This parameter determines the object value after the bus voltage returns. It is visible only if "data point type | value range = DPT 249.600 | colour temperature value + brightness".	

Brightness value	**0** ... 100%
This parameter determines the object value after the bus voltage returns. It is visible only if "data point type | value range = DPT 249.600 | colour temperature value + brightness".	

Adjustment duration in the actuator	0 ... 100 min, 0, **1** ... 59 s, 0 ... 900 ms
This parameter determines the object value after the bus voltage returns. It is visible only if "data point type | value range = DPT 249.600 | colour temperature value + brightness".	

Colour value	#000000 ... **#FFFFFF**
This parameter determines the object values of the 3-byte value transmitter (or 6-byte value transmitter), brightness value (V), saturation (S) and colour hue (H) objects after the bus voltage returns. It is visible with "data point type | value range = RGB/HSV with colour wheel sequence (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001)", "data point type | value range = RGB/HSV with brightness adjustment (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001)" and "data point type | value range = colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)". The value (RGB/HSV) is configured by means of a colour picker. With the data point type | value range "colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)", the white value is configured by means of a separate slider.	

White value	0 ... **255**
This parameter determines the object value of the white value (W) after the bus voltage returns. It is visible only if "data point type | value range = colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)".	

Transmit value cyclically	**Inactive** Active
The value status of the switch channel output objects can be transmitted cyclically on the bus. This parameter enables the cyclical transmission.	

Cycle time	**0**...24 h | 0...**5**...59 min | **0**...59 s
This parameter defines the interval at which the value status is transmitted on the bus. The cycle time can be parameterised between 3 seconds and 24 hours.	

Disabling function	**Inactive** Active
This parameter enables the disabling function for the channel.	

At the beginning of the disabling function	**no reaction** Transmit value
Besides disabling the channel, the device can immediately react when the disabling occurs. This parameter defines the reaction of the channel at the beginning of the disabling.	

Value	**0** ... 100%
This parameter determines the object value at the beginning of the disabling. It is visible only if "data point type | value range = DPT 5.001 | 0 ... 100%".	

Value	**0** ... 255
This parameter determines the object value at the beginning of the disabling. It is visible only if "data point type | value range = DPT 5.010 | 0 ... 255".	

Value	**0** ... 360°
This parameter determines the object value at the beginning of the disabling. It is visible only if "data point type | value range = DPT 5.003 | 0 ... 360°".	

Value	**0** ... 255%
This parameter determines the object value at the beginning of the disabling. It is visible only if "data point type | value range = DPT 5.004 | 0 ... 255%".	

Value	-128...**0** ...127
This parameter determines the object value at the beginning of the disabling. It is visible only if "data point type | value range = DPT 6.010 | -128 ... 127".	

Value	**0** ... 65535
This parameter determines the object value at the beginning of the disabling. It is visible only if "data point type | value range = DPT 7.001 | 0 ... 65535".	

Colour temperature value	1000 ... **2700** ... 10000 K
This parameter determines the object value at the beginning of the disabling. It is visible only if "data point type | value range = DPT 7.600 | 1000 ... 10000 K".	

Value	-32768 ... **0** ... 32767
This parameter determines the object value at the beginning of the disabling. It is visible only if "data point type | value range = DPT 8.001 | -32768 ... 32767".	

Temperature value	0 ... **20** ... 40 °C
This parameter determines the object value at the beginning of the disabling. It is visible only if "data point type | value range = DPT 9.001 | 0 ... 40 °C".	

Brightness value	0, 50 ... **300** ... 1500 lux
This parameter determines the object value at the beginning of the disabling. It is visible only if "data point type | value range = DPT 9.004 | 0 ... 1500 lux".	

Colour temperature value	1000 ... **2700** ... 10000 K
This parameter determines the object value at the beginning of the disabling. It is visible only if "data point type | value range = DPT 249.600 | colour temperature value + brightness".	

Brightness value	**0** ... 100%
This parameter determines the object value at the beginning of the disabling. It is visible only if "data point type | value range = DPT 249.600 | colour temperature value + brightness".	

Adjustment duration in the actuator	0 ... 100 min, 0, **1** ... 59 s, 0 ... 900 ms
This parameter determines the object value at the beginning of the disabling. It is visible only if "data point type | value range = DPT 249.600 | colour temperature value + brightness".	

Colour value	#000000 ... **#FFFFFF**
This parameter determines the object values of the 3-byte value transmitter (or 6-byte value transmitter), brightness value (V), saturation (S) and colour hue (H) objects at the beginning of the disabling. It is visible with "data point type | value range = RGB/HSV with colour wheel sequence (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001)", "data point type | value range = RGB/HSV with brightness adjustment (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001)" and "data point type | value range = colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)". The value (RGB/HSV) is configured by means of a colour picker. With the data point type | value range "colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)", the white value is configured by means of a separate slider.	

White value	0 ... **255**
This parameter determines the object value of the white value (W) object at the beginning of the disabling. It is visible only if "data point type | value range = colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)".	

At the end of the disabling function	**no reaction** transmit current state Transmit value
Besides disabling the channel, the device can immediately react at the end of the disabling. This parameter defines the reaction of the channel at the end of the disabling.	

Value	**0** ... 100%
This parameter determines the object value at the end of the disabling. It is visible only if "data point type | value range = DPT 5.001 | 0 ... 100%".	

Value	**0** ... 255
This parameter determines the object value at the end of the disabling. It is visible only if "data point type | value range = DPT 5.010 | 0 ... 255".	

Value	**0** ... 360°
This parameter determines the object value at the end of the disabling. It is visible only if "data point type | value range = DPT 5.003 | 0 ... 360°".	

Value	**0** ... 255%
This parameter determines the object value at the end of the disabling. It is visible only if "data point type | value range = DPT 5.004 | 0 ... 255%".	

Value	-128...**0** ...127
This parameter determines the object value at the end of the disabling. It is visible only if "data point type | value range = DPT 6.010 | -128 ... 127".	

Value	**0** ... 65535
This parameter determines the object value at the end of the disabling. It is visible only if "data point type | value range = DPT 7.001 | 0 ... 65535".	

Colour temperature value	1000 ... **2700** ... 10000 K
This parameter determines the object value at the end of the disabling. It is visible only if "data point type | value range = DPT 7.600 | 1000 ... 10000 K".	

Value	-32768 ... **0** ... 32767
This parameter determines the object value at the end of the disabling. It is visible only if "data point type | value range = DPT 8.001 | -32768 ... 32767".	

Temperature value	0 ... **20** ... 40 °C
This parameter determines the object value at the end of the disabling. It is visible only if "data point type | value range = DPT 9.001 | 0 ... 40 °C".	

Brightness value	0, 50 ... **300** ... 1500 lux
This parameter determines the object value at the end of the disabling. It is visible only if "data point type | value range = DPT 9.004 | 0 ... 1500 lux".	

Colour temperature value	1000 ... **2700** ... 10000 K
This parameter determines the object value at the end of the disabling. It is visible only if "data point type | value range = DPT 249.600 | colour temperature value + brightness".	

Brightness value	**0** ... 100%
This parameter determines the object value at the end of the disabling. It is visible only if "data point type | value range = DPT 249.600 | colour temperature value + brightness".	

Adjustment duration in the actuator	0 ... 100 min, 0, **1** ... 59 s, 0 ... 900 ms
This parameter determines the object value at the end of the disabling. It is visible only if "data point type | value range = DPT 249.600 | colour temperature value + brightness".	

Colour value	#000000 ... **#FFFFFF**
This parameter determines the object values of the 3-byte value transmitter (or 6-byte value transmitter), brightness value (V), saturation (S) and colour hue (H) objects at the end of the disabling. It is visible with "data point type | value range = RGB/HSV with colour wheel sequence (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001)", "data point type | value range = RGB/HSV with brightness adjustment (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001)" and "data point type | value range = colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)". The value (RGB/HSV) is configured by means of a colour picker. With the data point type | value range "colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)", the white value is configured by means of a separate slider.	

White value	0 ... **255**
This parameter determines the object value of the white value (W) object at the end of the disabling. It is visible only if "data point type | value range = colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)".	

Object polarity	**0 = Released / 1 = Locked** 1 = Released / 0 = Locked
This parameter defines the value of the disabling object at which the disabling function is active.	

13.3.4.2 Object list

The following communication objects are available in the "switch" channel function with the parameterised "value transmitter" function. The name can be adjusted with the "Name" parameter.

Function	Name	Type	DPT	Flag
Object 1 - Value transmitter – 0 ... 100% Object 2 - Value transmitter – 0 ... 100%	I … - Output	1-byte	5,001	C, R, -, T, A
1-byte object for the transmission of values from 0 to 100%. This is object 1 or 2 of the parameterised output objects. These objects are visible only if "data point type | value range = DPT 5.001 | 0 ... 100%".				

Function	Name	Type	DPT	Flag
Object 1 - Value transmitter – 0 ... 255 Object 2 - Value transmitter – 0 ... 255	I … - Output	1-byte	5,010	C, R, -, T, A
1-byte object for the transmission of values from 0 to 255. This is object 1 or 2 of the parameterised output objects. These objects are visible only if "data point type | value range = DPT 5.010 | 0 ... 255".				

Function	Name	Type	DPT	Flag
Object 1 - Value transmitter – 0 ... 360° Object 2 - Value transmitter – 0 ... 360°	I … - Output	1-byte	5,003	C, R, -, T, A
1-byte object for the transmission of values from 0 to 360°. This is object 1 or 2 of the parameterised output objects. These objects are visible only if "data point type | value range = DPT 5.003 | 0 ... 360°".				

Function	Name	Type	DPT	Flag
Object 1 - Value transmitter – 0 ... 255% Object 2 - Value transmitter – 0 ... 255%	I … - Output	1-byte	5,004	C, R, -, T, A
1-byte object for the transmission of values from 0 to 255%. This is object 1 or 2 of the parameterised output objects. These objects are visible only if "data point type | value range = DPT 5.004 | 0 ... 255%".				

Function	Name	Type	DPT	Flag
Object 1 - Value transmitter – -128 ... 127 Object 2 - Value transmitter – -128 ... 127	I … - Output	1-byte	6,010	C, R, -, T, A
1-byte object for the transmission of values from -128 to 127. This is object 1 or 2 of the parameterised output objects. These objects are visible only if "data point type | value range = DPT 6.010 | -128 ... 127".				

Function	Name	Type	DPT	Flag
Object 1 - Value transmitter – 0 ... 65535 Object 2 - Value transmitter – 0 ... 65535	I … - Output	2-byte	7,001	C, R, -, T, A
2-byte object for the transmission of values from 0 to 65535. This is object 1 or 2 of the parameterised output objects. These objects are visible only if "data point type | value range = DPT 7.001 | 0 ... 65535".				

Function	Name	Type	DPT	Flag
Colour temperature value A Colour temperature value B	I … - Output	2-byte	7,600	C, R, -, T, A
2-byte object for transmitting colour temperatures from 1000 to 10000 Kelvin. This is object 1 or 2 of the parameterised output objects. These objects are visible only if "data point type | value range = DPT 7.600 | 1000 ... 10000 K".				

Function	Name	Type	DPT	Flag
Object 1 - Value transmitter – -32768 ... 32767 Object 2 - Value transmitter – -32768 ... 32767	I … - Output	2-byte	8,001	C, R, -, T, A
2-byte object for the transmission of values from -32768 to 32767. This is object 1 or 2 of the parameterised output objects. These objects are visible only if "data point type | value range = DPT 8.001 | -32768 ... 32767".				

Function	Name	Type	DPT	Flag
Temperature value A Temperature value B	I … - Output	2-byte	9,001	C, R, -, T, A
2-byte object for transmitting temperature values from 0 to 40 °C. This is object 1 or 2 of the parameterised output objects. These objects are visible only if "data point type | value range = DPT 9.001 | 0 ... 40 °C".				

Function	Name	Type	DPT	Flag
Brightness value A Brightness value B	I … - Output	2-byte	9,004	C, R, -, T, A
2-byte object for the transmission of brightness values from 0 to 1500 lux. This is object 1 or 2 of the parameterised output objects. These objects are visible only if "data point type | value range = DPT 9.004 | 0 ... 1500 lux".				

Function	Name	Type	DPT	Flag
Colour temperature value and brightness value A Colour temperature value and brightness value B	I … - Output	6-byte	249,600	C, R, -, T, A
6-byte object used to transmit a colour temperature value, a brightness value and the adjustment time in the actuator. The actuator sets the received values during the adjustment time. This is object 1 or 2 of the parameterised output objects. These objects are visible only if "data point type | value range = DPT 249.600 | colour temperature value + brightness" applies.				

Function	Name	Type	DPT	Flag
Object 1 - Value transmitter - RGB/HSV (colour wheel sequence) Object 2 - Value transmitter - RGB/HSV (colour wheel sequence)	I … - Output	3-byte	232,600	C, R, -, T, A
3-byte object for transmitting 3-byte colour information. This is object 1 or 2 of the parameterised output objects. These objects are visible only if "data point type | value range = RGB/HSV with colour wheel sequence (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001)".				

Function	Name	Type	DPT	Flag
Object 1 - Value transmitter - RGB/HSV (brightness adjustment) Object 2 - Value transmitter - RGB/HSV (brightness adjustment)	I … - Output	3-byte	232,600	C, R, -, T, A
3-byte object for transmitting 3-byte colour information. This is object 1 or 2 of the parameterised output objects. These objects are visible only with data point type | value range: RGB/HSV with brightness adjustment (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001).				

Function	Name	Type	DPT	Flag
RGBW A RGBW B	I … - Output	6-byte	251,600	C, R, -, T, A
6-byte object for transmitting 6-byte colour information. This is object 1 or 2 of the parameterised output objects. These objects are visible only with data point type | value range: colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001).				

Function	Name	Type	DPT	Flag
Colour hue (H) A Colour hue (H) B	I … - Output	1-byte	5,003	C, R, -, T, A
1-byte object for transmitting the colour hue. This is object 1 or 2 of the parameterised output objects. These objects are visible only with data point type | value range: – - RGB/HSV with colour wheel sequence (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001) – - RGB/HSV with brightness adjustment (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001) – - Colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)				

Function	Name	Type	DPT	Flag
Saturation (S) A Saturation (S) B	I … - Output	1-byte	5,001	C, R, -, T, A

1-byte object for transmitting the saturation. This is object 1 or 2 of the parameterised output objects.

These objects are visible only with data point type | value range:
- - RGB/HSV with colour wheel sequence (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001)
- - RGB/HSV with brightness adjustment (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001)
- - Colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)

Function	Name	Type	DPT	Flag
Brightness value (V) A Brightness value (V) B	I … - Output	1-byte	5,001	C, R, -, T, A

1-byte object for transmitting the brightness value. This is object 1 or 2 of the parameterised output objects.

These objects are visible only with data point type | value range:
- - RGB/HSV with colour wheel sequence (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001)
- - RGB/HSV with brightness adjustment (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001)
- - Colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001)

Function	Name	Type	DPT	Flag
White value (W) A White value (W) B	I … - Output	1-byte	5,001	C, R, -, T, A

1-byte object for transmitting the white level. This is object 1 or 2 of the parameterised output objects.

These objects are visible only with data point type | value range: colour value RGBW/HSVW (RGBW: DPT 251.600, HSVW: DPT 5.003, DPT 5.001, DPT 5.001, DPT 5.001).

Function	Name	Type	DPT	Flag
Object 1 - Value transmitter - Brightness value (V) - Status Object 2 - Value transmitter - Brightness value (V) - Status	I … - Input	1-byte	5,001	C, -, W, -, U

1-byte object for receiving the brightness value. This is object 1 or 2 of the parameterised output objects.

These objects are only visible with the following configuration:

- - Data point type | value range: RGB/HSV with brightness adjustment (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001)
- - "Start value" parameter = as value from brightness (V) status object

Function	Name	Type	DPT	Flag
Object 1 - Value transmitter - Colour hue (H) - Status Object 2 - Value transmitter - Colour hue (H) - Status	I … - Input	1-byte	5,003	C, -, W, -, U

1-byte object for receiving the colour hue. This is object 1 or 2 of the parameterised output objects.

These objects are only visible with the following configuration:

- - Data point type | value range: RGB/HSV with colour wheel sequence (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001)
- - "Start value" parameter = as value from colour hue (H) status object

Function	Name	Type	DPT	Flag
Object 1 - Value transmitter - RGB - Status Object 2 - Value transmitter - RGB - Status	I … - Input	3-byte	232,600	C, -, W, -, U

3-byte object for receiving 3-byte colour information. This is object 1 or 2 of the parameterised output objects.

These objects are only visible with the following configuration:

- - Parameter: data point type | value range: RGB/HSV with brightness adjustment (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001), RGB/HSV with colour wheel sequence (RGB: DPT 232.600, HSV: DPT 5.003, DPT 5.001, DPT 5.001).
- - "Start value" parameter = as value from RGB status object

Function	Name	Type	DPT	Flag
Lock A Lock B	I … - Input	1-bit	1,003	C, -, W, -, U
1-bit object for activating or deactivating the disabling function. The object polarity can be configured. This is object 1 or 2 of the parameterised output objects.				

13.3.5 Scene extension unit

In the "switch" channel function, each object of the switch can be parameterised separately for the "scene extension unit" function. The ETS indicates up to two communication objects for each switch channel output object for the "scene extension unit" function. The parameters can be used to determine which value the "scene extension unit" object receives when the contact is closed and/or opened. Furthermore, the behaviour of the switch channel output object after the bus voltage returns can be parameterised and a disabling function activated. The switching status of the switch channel output objects can be transmitted cyclically on the bus. No distinction is made between a brief or long press.

In the scene extension unit function, the device either calls a parameterised scene number (1…64) or switches between two scenes when the contact is closed or opened. This makes it possible to recall scenes stored in other devices.

Setting options when closing or opening the contact:

- Recall scene: results in simply recalling the scene.
- Switch over scene: The input option for a second scene number (1…64) appears. The two entered scene numbers are switched to and from each time the contact is closed or opened.

ℹ This function can be used to call up to four different scenes if the switch is switched four times (Close - Open - Close - Open) if "Switch over scenes" is parameterised for "When closing the contact" and "When opening the contact".

13.3.5.1 Table of parameters

The following parameters are available in the "switch" channel function with the parameterised "scene extension unit" function for each switch channel output object.

When closing the contact	**Recall scene** Switch over scene
The functionality of the scene extension unit when closing the contact of the switch is set here. Recall scene: results in simply recalling the scene. Switch over scene: The input option for a second scene number (1…64) appears. The two entered scene numbers are switched to and from each time the contact is closed. i The device transmits a telegram with the respective scene number on the bus.	

Scene number	**1** ... 64
According to the KNX standard, objects with data type 18.001 "Scene Control" can call up to 64 scenes by their numbers. The scene number to be transmitted when closing the contact is defined here. The input of the scene number is available only if "When closing the contact = Call scene".	

First scene number	**1** ... 64
According to the KNX standard, objects with data type 18.001 "Scene Control" can call up to 64 scenes by their numbers. The scene number to be transmitted when closing the contact is defined here. The input of the first scene number is available only if "When closing the contact = Switch over scene".	

Second scene number	1, **2** ... 64
According to the KNX standard, objects with data type 18.001 "Scene Control" can call up to 64 scenes by their numbers. The scene number to be transmitted when closing the contact is defined here. The input of the second scene number is available only if "When closing the contact = Switch over scene".	

When opening the contact	**Recall scene** Switch over scene

The functionality of the scene extension unit when opening the contact of the switch is set here.

Recall scene: results in simply recalling the scene.

Switch over scene: The input option for a second scene number (1…64) appears. The two entered scene numbers are switched to and from each time the contact is opened.

i The device transmits a telegram with the respective scene number on the bus.

Scene number	**1** ... 64

According to the KNX standard, objects with data type 18.001 "Scene Control" can call up to 64 scenes by their numbers. The scene number to be transmitted when opening the contact is defined here.

The input of the scene number is available only if "When closing the contact = Call scene".

First scene number	**1** ... 64

According to the KNX standard, objects with data type 18.001 "Scene Control" can call up to 64 scenes by their numbers. The scene number to be transmitted when opening the contact is defined here.

The input of the first scene number is available only if "When closing the contact = Switch over scene".

Second scene number	1, **2** ... 64

According to the KNX standard, objects with data type 18.001 "Scene Control" can call up to 64 scenes by their numbers. The scene number to be transmitted when opening the contact is defined here.

The input of the second scene number is available only if "When closing the contact = Switch over scene".

After the bus voltage returns	**no reaction** transmit current state Recall scene

This parameter determines the reaction after the bus voltage returns.

Either no telegram, a telegram according to the current input state at the channel or a parameterised scene number is transmitted on the bus according to the paramet-erisation.

The reaction after the bus voltage returns takes place only after the parameterised "delay after bus voltage returns" expires ("General" parameter page).

Scene number	**1** ... 64
The parameter defines here the scene number to be transmitted after the bus voltage returns.	

Send scene number cyclically	Active **Inactive**
The output objects of the "door/window status" channel function can be transmitted cyclically on the bus. This parameter enables the cyclical transmission.	

Cycle time	**0** ... 24 h | 0 … **5** ... 59 min | **0** ... 59 s
This parameter defines the interval at which the output objects are transmitted on the bus. The cycle time can be parameterised between 3 seconds and 24 hours.	

Disabling function	**Inactive** Active
This parameter enables the disabling function for the channel.	

At the beginning of the disabling function	**no reaction** Recall scene
Besides disabling the channel, the device can immediately react when the disabling occurs. This parameter defines the reaction of the channel at the beginning of the disabling.	

Scene number	**1** ... 64
The scene number to be transmitted at the beginning of the disabling is defined here.	

At the end of the disabling function	**no reaction** transmit current state Recall scene
Besides disabling the channel, the device can immediately react at the end of the disabling. This parameter defines the reaction of the channel at the end of the disabling.	

Scene number	**1** ... 64
The scene number to be transmitted at the end of the disabling is defined here.	

Object polarity	**0 = enable / 1 = disable** 1 = enable / 0 = disable
This parameter defines the value of the disabling object at which the disabling function is active.	

13.3.5.2 Object list

The following communication objects are available in the "switch" channel function with the parameterised "scene extension unit" function. The name can be adjusted with the "Name" parameter.

Function	Name	Type	DPT	Flag
Object 1 - Scene extension unit - Scene number	I ... - Output	1-byte	18,001	C, R, -, T, A
1-byte object for recalling, switching over or storing one of a maximum of 64 scenes at a scene push-button sensor. This is object 1 of the parameterised output objects.				

Function	Name	Type	DPT	Flag
Object 1 - Scene extension unit - Disabling	I ... - Input	1-bit	1,003	C, -, W, -, U
1-bit object for activating or deactivating the disabling function. The object polarity can be configured. This is object 1 of the parameterised output objects.				

Function	Name	Type	DPT	Flag
Object 2 - Scene extension unit - Scene number	I ... - Output	1-byte	18,001	C, R, -, T, A
1-byte object for recalling, switching over or storing one of a maximum of 64 scenes at a scene push-button sensor. This is object 2 of the parameterised output objects.				

Function	Name	Type	DPT	Flag
Object 2 - Scene extension unit - Disabling	I ... - Input	1-bit	1,003	C, -, W, -, U
1-bit object for activating or deactivating the disabling function. The object polarity can be configured. This is object 2 of the parameterised output objects.				

13.3.6 Room temperature control point

In the "switch" channel function, each object of the switch can be parameterised separately for the "room temperature control point" function. The ETS indicates up to three communication objects for each switch channel output object for the "room temperature control point" function. The parameters can be used to determine which values the "RTC control point" objects receive when the contact is closed or opened. Furthermore, the behaviour of the switch channel output object after the bus voltage returns can be parameterised and a disabling function activated. The RTC status of the switch channel output objects can be transmitted cyclically on the bus. No distinction is made between a brief or long press.

The "room temperature control point" channel function can be used to actuate a KNX room temperature controller.

The room temperature control point itself is not involved in the temperature control process. It allows the user to operate the single-room regulation from different points in the room. The room temperature control point can also be used to control central heating control devices located, for example, in a sub-distribution unit.

Typical KNX room temperature controllers generally offer different ways of influencing the room temperature control:

– Operating mode switchover:
  Switching between different modes of operation (e. g. "Comfort", "Night" ...) with different setpoint temperatures assigned to each mode by the controller.
– Presence function:
  Signalling the presence of a person in a room. The signalling may also be combined with a configured switchover in the mode of operation.
– Setpoint temperature shift:
  Adjustment of the setpoint temperature via a temperature offset (DPT 9.002) or via levels (DPT 6.010).

The room temperature control point is operated by the switch functions of the device. In this way, it is possible to completely control a room temperature controller by changing the operating mode, specifying the presence function or adjusting the target temperature shift.

13.3.6.1 Operating mode switchover

Switchover of the controller operating mode can be effected in accordance with the standard function block for room temperature controllers defined in the KNX handbook using two 1-byte communication objects. The operating mode can be switched over with the normal and with the forced objects. The objects "RTC control point - Operating mode" enable the following modes to be selected:

– Comfort
– Standby
– Night
– Frost/heat protection

– Switchover: comfort/standby
– Switchover: comfort/night
– Switchover: standby/night
– Switchover: comfort/standby/night

The communication object "RTC control point - Operating mode - Forcing" is of higher priority. It permits forced switching between the following modes of operation:

– Forcing inactive (auto)
– Comfort
– Standby
– Night
– Frost/heat protection
– Switchover: comfort/standby
– Switchover: comfort/night
– Switchover: standby/night
– Switchover: comfort/standby/night
– Toggle: forced inactive (auto) / comfort
– Toggle: forced inactive (auto) / standby
– Toggle: forced inactive (auto) / night
– Switchover: forced inactive (auto) / frost/heat protection

The operating mode transmitted on the bus when closing or opening the switch of the room temperature control point is defined by the parameters "When closing the contact" and "When opening the contact". It is possible that either one of the above modes is called up or two or three modes are switched between.

13.3.6.2 Presence function

All channels whose functionality is set to "presence function" have the two communication objects "RTC control point - Presence" and "RTC control point - Presence - Status". The parameters "When closing the contact" and "When opening the contact" determine the object value transmitted on the bus when closing or opening the contact.

13.3.6.3 Setpoint temperature shift

Another function of the room temperature control point that is available is the target temperature shift. It makes use of either two 2-byte communication objects with datapoint type 9.002 or two 1-byte communication objects with datapoint type 6.010 (integer with sign).

This control point function allows the basic setpoint temperature to be shifted on a room temperature controller by closing or opening the contact. The control point is usually operated in the same way as the main control point. A switch output object parameterised as setpoint temperature shift reduces or increases the setpoint temperature shift value once each time the contact is closed or opened. The direction of the value adjustment is defined by the parameters "When closing the contact" and "When opening the contact".

Communication with main controller

To enable the device to shift the target temperature on a room temperature controller, the controller must have input and output objects for the target temperature shift. In this case, the output object of the controller must be connected to the input object of the room temperature control point, and the input object of the controller must be connected to the output object of the room temperature control point in each case via their own group address.

All objects are of the same datapoint type and have the same value range. A target temperature shift is interpreted by count values: a shift in positive direction is expressed by positive values, whereas a shift in negative direction is represented by negative object values. An object value of "0" means that no target temperature shift has been set.

The room temperature control points detect the current position of the setpoint adjustment by means of the object "RTC control point - Target temperature shift - Status" of the room temperature control point connected to the room temperature controller. Starting from the value of the communication object, the setpoint is adjusted in the configured direction each time a button is pressed on a room temperature control point. Each time the setpoint is adjusted, the new shift by means of the object "RTC control point - Target temperature shift" of the room temperature control point is sent to the room temperature regulator.

With the "by counter value" function, the individual levels are weighted by the controller itself.

This requires that the respective communication objects are connected to all room temperature control points and the controller. The feedback information from the controller enables the room temperature control point to continue the adjustment at any time at the right point.

13.3.6.4 Table of parameters

The following parameters are available in the "switch" channel function with the parameterised "room temperature control point" function for each switch channel output object.

Function	**Operating mode switchover** Forced operating mode switchover Presence function Setpoint temperature shift
A room temperature control point can optionally switch over (force) the operating mode with normal or high priority, change the presence status or change the current room temperature setpoint value. With regard to the setting of this parameter, the ETS shows further parameters.	

When closing the contact	**Comfort** Standby Night Frost/heat protection Switchover: comfort/standby Switchover: comfort/night Switchover: standby/night Switchover: comfort/standby/night
If the room temperature control point is intended to change over the operating mode of the room temperature controller with normal priority, the extension unit can either switch on a defined operating mode or switch between different operating modes when the contact is closed.	

When opening the contact	**Comfort** Standby Night Frost/heat protection Switchover: comfort/standby Switchover: comfort/night Switchover: standby/night Switchover: comfort/standby/night
If the room temperature control point is intended to change over the operating mode of the room temperature controller with normal priority, the extension unit can either switch on a defined operating mode or switch between different operating modes when the contact is opened.	

When closing the contact	Forcing inactive (auto) **Comfort** Standby Night Frost/heat protection Switchover: comfort/standby Switchover: comfort/night Switchover: standby/night Switchover: comfort/standby/night Toggle: forced inactive (auto) / comfort Toggle: forced inactive (auto) / standby Toggle: forced inactive (auto) / night Switchover: forced inactive (auto) / frost/ heat protection
If the room temperature control point is intended to switch the operating mode of the room temperature controller with high priority, the extension unit can either enable the change-over with normal priority (auto), switch on a defined operating mode with high priority or switch between different operating modes when the contact is closed.	

When opening the contact	Forcing inactive (auto) **Comfort** Standby Night Frost/heat protection Switchover: comfort/standby Switchover: comfort/night Switchover: standby/night Switchover: comfort/standby/night Toggle: forced inactive (auto) / comfort Toggle: forced inactive (auto) / standby Toggle: forced inactive (auto) / night Switchover: forced inactive (auto) / frost/ heat protection
If the room temperature control point is intended to switch the operating mode of the room temperature controller with high priority, the extension unit can either enable the change-over with normal priority (auto), switch on a defined operating mode with high priority or switch between different operating modes when the contact is opened.	

When closing the contact	Presence ON Presence OFF **Presence TOGGLE**
The room temperature control point can switch the presence state of the room temperature controller either on or off in a defined way or the extension unit can switch between both states ("Presence TOGGLE") when the contact is closed. This parameter is only visible if "Function = presence function".	

When opening the contact	Presence ON Presence OFF **Presence TOGGLE**
The room temperature control point can switch the presence state of the room temperature controller either on or off in a defined way or the extension unit can switch between both states ("Presence TOGGLE") when the contact is opened. This parameter is only visible if "Function = presence function".	

Setpoint temperature shift	**by relative temperature value** By meter value
Depending on the setting of the "Target temperature shift" parameter, the shift takes place by means of the 2-byte communication object in accordance with KNX DPT 9.002 or KNX DPT 6.010. This parameter is visible only if "function = target temperature shift".	

When closing the contact	+2 K +1.5 K +1 K **+0.5 K** -0.5 K -1 K -1.5 K -2 K
The temperature difference is defined in Kelvin here by which the setpoint temperature will be shifted up or down when the contact is closed. To shift the target temperature value, the room temperature control point uses the two communication objects "RTC control point - Target temperature shift" and "RTC control point - Target temperature shift - Status". The communication object "RTC control point - Target temperature shift - Status" informs the room temperature control point about the current state of the room temperature controller. Based on this value and the parameter here, the room temperature control point calculates the new level value, which it sends to the room temperature controller via the communication object "RTC control point - Target temperature shift". This parameter is visible only if "Functionality = setpoint temperature shift" and "Setpoint temperature shift = by relative temperature value".	

When opening the contact	+2 K +1.5 K +1 K **+0.5 K** -0.5 K -1 K -1.5 K -2 K

The difference in temperature by which the setpoint temperature is shifted up or down when the contact is opened is defined in Kelvin here.
To shift the target temperature value, the room temperature control point uses the two communication objects "RTC control point - Target temperature shift" and "RTC control point - Target temperature shift - Status".
The communication object "RTC control point - Target temperature shift - Status" informs the room temperature control point about the current state of the room temperature controller. Based on this value and the parameter here, the room temperature control point calculates the new level value, which it sends to the room temperature controller via the communication object "RTC control point - Target temperature shift".

This parameter is visible only if "Functionality = setpoint temperature shift" and "Setpoint temperature shift = by relative temperature value".

When closing the contact	Increase setpoint temperature **Reduce setpoint temperature**

The direction of the target temperature shift is defined here at the room temperature control point.
To shift the target temperature value, the room temperature control point uses the two communication objects "RTC control point - Target temperature shift" and "RTC control point - Target temperature shift - Status".
The communication object "RTC control point - Target temperature shift - Status" informs the extension unit about the current state of the room temperature controller. Based on this value and the parameter here, the room temperature control point calculates the new level value, which it sends to the room temperature controller via the communication object "RTC control point - Target temperature shift".

This parameter is visible only if "function = target temperature shift" and "type of target temperature shift = above meter value".

When opening the contact	Increase setpoint temperature **Reduce setpoint temperature**
The direction of the target temperature shift is defined here at the room temperature control point. To shift the target temperature value, the room temperature control point uses the two communication objects "RTC control point - Target temperature shift" and "RTC control point - Target temperature shift - Status". The communication object "RTC control point - Target temperature shift - Status" informs the extension unit about the current state of the room temperature controller. Based on this value and the parameter here, the room temperature control point calculates the new level value, which it sends to the room temperature controller via the communication object "RTC control point - Target temperature shift". This parameter is visible only if "function = target temperature shift" and "type of target temperature shift = above meter value".	

After the bus voltage returns	**no reaction** transmit current state Comfort Standby Night Frost/heat protection
This parameter determines the reaction after the bus voltage returns. Either no telegram, a telegram according to the current input state at the channel, a comfort telegram, a standby telegram, a night telegram or a frost/heat protection telegram is transmitted on the bus according to the parameterisation. The reaction after the bus voltage returns takes place only after the parameterised "delay after bus voltage returns" expires ("General" parameter page). Visible only if "Functionality = operating mode change-over".	

After the bus voltage returns	**no reaction** transmit current state Forcing inactive (auto) Comfort Standby Night Frost/heat protection
This parameter determines the reaction after the bus voltage returns. Either no telegram, a telegram according to the current input state at the channel, a forcing inactive (auto) telegram, a comfort telegram, a standby telegram, a night telegram or a frost/heat protection telegram is transmitted on the bus according to the parameterisation. The reaction after the bus voltage returns takes place only after the parameterised "delay after bus voltage returns" expires ("General" parameter page). Visible only if "Functionality = forced operating mode change-over".	

After the bus voltage returns	**no reaction** transmit current state Presence ON Presence OFF Presence TOGGLE
This parameter determines the reaction after the bus voltage returns. Either no telegram, a telegram according to the current input state at the channel or a presence telegram is transmitted on the bus according to the parameterisation. The reaction after the bus voltage returns takes place only after the parameterised "delay after bus voltage returns" expires ("General" parameter page). This parameter is only visible if "Function = presence function".	

After the bus voltage returns	**no reaction** +2 K +1.5 K +1 K +0.5 K -0.5 K -1 K -1.5 K -2 K
This parameter determines the reaction after the bus voltage returns. Either no telegram or a temperature value telegram is transmitted on the bus according to the parameterisation. The reaction after the bus voltage returns takes place only after the parameterised "delay after bus voltage returns" expires ("General" parameter page). This parameter is visible only if "Functionality = setpoint temperature shift" and "Setpoint temperature shift = by relative temperature value".	

After the bus voltage returns	**no reaction** Increase setpoint temperature Reduce setpoint temperature
This parameter determines the reaction after the bus voltage returns. Either no telegram or a counting value telegram is transmitted on the bus according to the parameterisation. The reaction after the bus voltage returns takes place only after the parameterised "delay after bus voltage returns" expires ("General" parameter page). This parameter is visible only if "function = target temperature shift" and "type of target temperature shift = above meter value".	

Send operating mode cyclically	**Inactive** Active
The switching status of the switch channel output objects can be transmitted cyclically on the bus. This parameter enables the cyclical transmission. Visible only if "Functionality = operating mode change-over".	

Send forced operation mode cyclically	**Inactive** Active
The switching status of the switch channel output objects can be transmitted cyclically on the bus. This parameter enables the cyclical transmission. Visible only if "Functionality = forced operating mode change-over".	

Send presence status cyclically	**Inactive** Active
The switching status of the switch channel output objects can be transmitted cyclically on the bus. This parameter enables the cyclical transmission. This parameter is only visible if "Function = presence function".	

Send target temperature shift cyclically	**Inactive** Active
The switching status of the switch channel output objects can be transmitted cyclically on the bus. This parameter enables the cyclical transmission. This parameter is visible only if "function = target temperature shift".	

Cycle time	**0**...24 h | 0...**5**...59 min | **0**...59 s
This parameter defines the interval at which the switching status is transmitted on the bus. The cycle time can be parameterised between 3 seconds and 24 hours.	

Disabling function	**Inactive** Active
This parameter enables the disabling function for the channel.	

At the beginning of the disabling function	**no reaction** Comfort Standby Night Frost/heat protection
Besides disabling the channel, the device can immediately react when the disabling occurs. This parameter defines the reaction of the channel at the beginning of the disabling. Visible only if "Functionality = operating mode change-over".	

At the beginning of the disabling function	**no reaction** Forcing inactive (auto) Comfort Standby Night Frost/heat protection
Besides disabling the channel, the device can immediately react when the disabling occurs. This parameter defines the reaction of the channel at the beginning of the disabling. Visible only if "Functionality = forced operating mode change-over".	

At the beginning of the disabling function	**no reaction** Presence ON Presence OFF Presence TOGGLE
Besides disabling the channel, the device can immediately react when the disabling occurs. This parameter defines the reaction of the channel at the beginning of the disabling. This parameter is only visible if "Function = presence function".	

At the beginning of the disabling function	**no reaction** +2 K +1.5 K +1 K +0.5 K -0.5 K -1 K -1.5 K -2 K
Besides disabling the channel, the device can immediately react when the disabling occurs. This parameter defines the reaction of the channel at the beginning of the disabling. This parameter is visible only if "Functionality = setpoint temperature shift" and "Setpoint temperature shift = by relative temperature value".	

At the beginning of the disabling function	no reaction Increase setpoint temperature Reduce setpoint temperature

Besides disabling the channel, the device can immediately react when the disabling occurs.

This parameter defines the reaction of the channel at the beginning of the disabling.

This parameter is visible only if "function = target temperature shift" and "type of target temperature shift = above meter value".

At the end of the disabling function	no reaction transmit current state Comfort Standby Night Frost/heat protection

Besides disabling the channel, the device can immediately react at the end of the disabling.

This parameter defines the reaction of the channel at the end of the disabling.

Visible only if "Functionality = operating mode change-over".

At the end of the disabling function	no reaction transmit current state Forcing inactive (auto) Comfort Standby Night Frost/heat protection

Besides disabling the channel, the device can immediately react at the end of the disabling.

This parameter defines the reaction of the channel at the end of the disabling.

Visible only if "Functionality = forced operating mode change-over".

At the end of the disabling function	no reaction transmit current state Presence ON Presence OFF Presence TOGGLE

Besides disabling the channel, the device can immediately react at the end of the disabling.

This parameter defines the reaction of the channel at the end of the disabling.

This parameter is only visible if "Function = presence function".

At the end of the disabling function	**no reaction** +2 K +1.5 K +1 K +0.5 K -0.5 K -1 K -1.5 K -2 K
Besides disabling the channel, the device can immediately react at the end of the disabling. This parameter defines the reaction of the channel at the end of the disabling. This parameter is visible only if "Functionality = setpoint temperature shift" and "Setpoint temperature shift = by relative temperature value".	

At the end of the disabling function	**no reaction** Increase setpoint temperature Reduce setpoint temperature
Besides disabling the channel, the device can immediately react at the end of the disabling. This parameter defines the reaction of the channel at the end of the disabling. This parameter is visible only if "function = target temperature shift" and "type of target temperature shift = above meter value".	

Object polarity	**0 = Released / 1 = Locked** 1 = Released / 0 = Locked
This parameter defines the value of the disabling object at which the disabling function is active.	

13.3.6.5 Object list

The following communication objects are available in the "switch" channel function with the parameterised "room temperature control point" function. The name can be adjusted with the "Name" parameter.

Function	Name	Type	DPT	Flag
Object 1 - RTC control point - Operating mode	I ... - Output	1-byte	20,102	C, R, -, T, A
1-byte object for switching a room temperature controller between the Comfort, Standby, Night and Frost/heat protection operating modes. This is object 1 of the parameterised output objects. This object is only visible if "Function = operating mode switchover".				

Function	Name	Type	DPT	Flag
Object 1 - RTC control point - Operating mode - Status	I ... - Input	1-byte	20,102	C, -, W, -, U
1-byte object for receiving the operating mode of a room temperature controller. This is object 1 of the parameterised output objects. This object is only visible if "Function = operating mode switchover".				

Function	Name	Type	DPT	Flag
Object 1 - RTC control point - Operating mode - Forcing	I ... - Output	1-byte	20,102	C, R, -, T, A
1-byte object for switching a room temperature controller under forced control between the Automatic, Comfort, Standby, Night and Frost / heat protection operating modes. This is object 1 of the parameterised output objects. This object is only visible if "Function = forced operating mode switchover".				

Function	Name	Type	DPT	Flag
Object 1 - RTC control point - Operating mode - Forcing - Status	I ... - Input	1-byte	20,102	C, -, W, -, U
1-byte object for receiving the operating mode of a room temperature controller. This is object 1 of the parameterised output objects. This object is only visible if "Function = forced operating mode switchover".				

Function	Name	Type	DPT	Flag
Presence A	I ... - Output	1-bit	1,018	C, R, -, T, A
1-bit object for changing over the presence status of a room temperature controller. This is object 1 of the parameterised output objects. This object is only visible if "Function = presence function".				

Function	Name	Type	DPT	Flag
Object 1 - RTC control point - Presence - Status	I ... - Input	1-bit	1,018	C, -, W, -, U
1-bit object for receiving the presence status of a room temperature controller. This is object 1 of the parameterised output objects. This object is only visible if "Function = presence function".				

Function	Name	Type	DPT	Flag
Setpoint shift A	I ... - Output	2-byte	9,002	C, R, -, T, A
2-byte object for specification of a target temperature shift in Kelvin. The value "0" means that no shift is active . Values can be specified between -670760 K and 670760 K. This is object 1 of the parameterised output objects. This object is visible only if "function = target temperature shift" and "type of target temperature shift = above relative temperature value".				

Function	Name	Type	DPT	Flag
Setpoint shift status A	I ... - Input	2-byte	9,002	C, -, W, -, U
2-byte object for receiving the status of the current target temperature shift in Kelvin. This is object 1 of the parameterised output objects. This object is visible only if "function = target temperature shift" and "type of target temperature shift = above relative temperature value".				

Function	Name	Type	DPT	Flag
Setpoint shift A	I ... - Output	1-byte	6,010	C, R, -, T, A
1-byte object for specification of a target temperature shift. The value "0" means that no shift is active . The value is depicted in a two's complement in the positive or negative direction. This is object 1 of the parameterised output objects. This object is visible only if "function = target temperature shift" and "type of target temperature shift = above meter value".				

Function	Name	Type	DPT	Flag
Setpoint shift status A	I ... - Input	1-byte	6,010	C, -, W, -, U
1-byte object to receive the status of the current target temperature shift. This is object 1 of the parameterised output objects. This object is visible only if "function = target temperature shift" and "type of target temperature shift = above meter value".				

Function	Name	Type	DPT	Flag
Lock A	I ... - Input	1-bit	1,003	C, -, W, -, U
1-bit object for activating or deactivating the disabling function. The object polarity can be configured. This is object 1 of the parameterised output objects.				

Function	Name	Type	DPT	Flag
Object 2 - RTC control point - Operating mode	I ... - Output	1-byte	20,102	C, R, -, T, A
1-byte object for switching a room temperature controller between the Comfort, Standby, Night and Frost/heat protection operating modes. This is object 2 of the parameterised output objects. This object is only visible if "Function = operating mode switchover".				

Function	Name	Type	DPT	Flag
Object 2 - RTC control point - Operating mode - Status	I ... - Input	1-byte	20,102	C, -, W, -, U
1-byte object for receiving the operating mode of a room temperature controller. This is object 2 of the parameterised output objects. This object is only visible if "Function = operating mode switchover".				

Function	Name	Type	DPT	Flag
Object 2 - RTC control point - Operating mode - Forcing	I ... - Output	1-byte	20,102	C, R, -, T, A
1-byte object for switching a room temperature controller under forced control between the Automatic, Comfort, Standby, Night and Frost / heat protection operating modes. This is object 2 of the parameterised output objects. This object is only visible if "Function = forced operating mode switchover".				

Function	Name	Type	DPT	Flag
Object 2 - RTC control point - Operating mode - Forcing - Status	I ... - Input	1-byte	20,102	C, -, W, -, U
1-byte object for receiving the operating mode of a room temperature controller. This is object 2 of the parameterised output objects. This object is only visible if "Function = forced operating mode switchover".				

Function	Name	Type	DPT	Flag
Presence B	I ... - Output	1-bit	1,018	C, R, -, T, A
1-bit object for changing over the presence status of a room temperature controller. This is object 2 of the parameterised output objects. This object is only visible if "Function = presence function".				

Function	Name	Type	DPT	Flag
Object 2 - RTC control point - Presence - Status	I ... - Input	1-bit	1,018	C, -, W, -, U
1-bit object for receiving the presence status of a room temperature controller. This is object 2 of the parameterised output objects. This object is only visible if "Function = presence function".				

Function	Name	Type	DPT	Flag
Setpoint shift B	I ... - Output	2-byte	9,002	C, R, -, T, A
2-byte object for specification of a target temperature shift in Kelvin. The value "0" means that no shift is active . Values can be specified between -670760 K and 670760 K. This is object 2 of the parameterised output objects. This object is visible only if "function = target temperature shift" and "type of target temperature shift = above relative temperature value".				

Function	Name	Type	DPT	Flag
Setpoint shift status B	I ... - Input	2-byte	9,002	C, -, W, -, U
2-byte object for receiving the status of the current target temperature shift in Kelvin. This is object 2 of the parameterised output objects. This object is visible only if "function = target temperature shift" and "type of target temperature shift = above relative temperature value".				

Function	Name	Type	DPT	Flag
Setpoint shift B	I ... - Output	1-byte	6,010	C, R, -, T, A
1-byte object for specification of a target temperature shift. The value "0" means that no shift is active . The value is depicted in a two's complement in the positive or negative direction. This is object 2 of the parameterised output objects. This object is visible only if "function = target temperature shift" and "type of target temperature shift = above meter value".				

Function	Name	Type	DPT	Flag
Setpoint shift status B	I ... - Input	1-byte	6,010	C, -, W, -, U
1-byte object to receive the status of the current target temperature shift. This is object 2 of the parameterised output objects. This object is visible only if "function = target temperature shift" and "type of target temperature shift = above meter value".				

Function	Name	Type	DPT	Flag
Lock B	I ... - Input	1-bit	1,003	C, -, W, -, U
1-bit object for activating or deactivating the disabling function. The object polarity can be configured. This is object 2 of the parameterised output objects.				

13.4 Door/window status

The "Door/window status" channel function can be parametrised for each input. The device can indicate a door/window status in combination with a sensor connected to the channel. In the "door/window status" channel function, the device indicates a door/window status on the bus by means of an output object according to the parameterisation.

ℹ The door/window status is transmitted in compressed form on the bus by the 2-byte object "Door/window status - Overall state - Status". The status can be interpreted and indicated by means of visualisation.

ℹ In addition, a door or window number can be assigned, with the effect that the status information is supplemented for visualisation by means of the object "Door/window status - Door/window number".

The ETS provides the suitable parameters for the function and up to five communication objects dynamically according to the parameterised function.

The following states are available for evaluation of a window sash:

– Open
– Closed
– Tilted
– Unknown

The following states are available for evaluation of a window handle:

– Open
– Closed
– Tilted
– Unknown

The following states are available for evaluation of a door leaf:

– Open
– Closed
– Unknown

The following states are available for evaluation of a door handle:

– Locked
– Unlocked
– Unknown

Door/window status in the single channel configuration

A contact can be evaluated in the single channel configuration. The "0" and "1" states can be evaluated. The meaning of the evaluated states can be parameterised flexibly in a table.

Door/window status in the combined channel configuration

Two contacts can be evaluated in the combined channel configuration. The "0" and "1" states can be evaluated separately for each contact. Contact 1 and contact 2 can be flexibly assigned to channels 1 and 2. The meaning of the evaluated states can be parameterised flexibly in a table.

Two channels, for example each with a magnetic contact, can be used. They can be used in the top and bottom window area, which allows the closed, open or tilted window status to be evaluated in combination.

Evaluation of the 2-byte object "Door/window status - Overall status - Status"

The device transmits suitable telegrams by means of the 2-byte object "Door/window status - Overall state - Status" on the bus according to the parameterisation.

The individual bits of the 2-byte object "Door/window status - Overall status - Status" have the following meaning...

Bit of the status object	Meaning
0 ... 2	"0" = undefined, "1" = leaf/sash closed, "2" = leaf/sash tilted, "3" = leaf/sash open
3 ... 5	"0" = undefined, "1" = handle closed, "2" = handle tilted, "3" = handle open
6 ... 7	"0" = undefined, "1" = closure unlocked, "2" = closure locked
8	"0" = no leaf/sash status, "1" leaf/sash status used
9	"0" = no handle status, "1" handle used status
10	"0" = no closure status, "1" closure used status
11	"0" = window, "1" = door
12	not used (permanent "0")
13	not used (permanent "0")
14	not used (permanent "0")
15	not used (permanent "0")

Advanced settings

An evaluation delay, an additional 1-bit status object, a debouncing time and the object polarity can be defined in the advanced parameters.

At the end of the evaluation delay, the device transmits the evaluated state on the bus.

An additional 1-bit status object can transmit the state of the contact according to the object polarity on the bus.

13.4.1 Table of parameters

The following parameters are available in the "door/window status" channel function.

Element	**Window** Door
This parameter defines the sub-element whose status is to be evaluated.	

Evaluation	**Wing** Handle
This parameter defines the sub-element whose status is to be evaluated. Visible only if the "Window" element has been parameterised.	

Evaluation	**Wing** Closure
This parameter defines the sub-element whose status is to be evaluated. Visible only if the "Door" element has been parameterised.	

Window number assigned	Active Inactive
The window element to be evaluated can be assigned an identifiable window number if this parameter is activated. Visible only if the "Window" element has been parameterised.	

Number	**0** ... 4294967295
This parameter defines the identifiable window number. The window number is transmitted on the bus if the status is changed by means of a communication object.	

Door number assigned	Active **Inactive**
The door element to be evaluated can be assigned an identifiable door number if this parameter is activated. Visible only if the "Door" element has been parameterised.	

Number	**0** ... 4294967295
This parameter defines the identifiable door number. The door number is transmitted on the bus in the event of a status change by means of a communication object.	

Name of contact 1	Free text
The text entered in this parameter is used to label the contact in the ETS parameter window (e. g. "Living room window", "Bathroom door"). The text is not programmed in the device.	

Leaf/sash (contact 1 = 0)	**Open** Closed Tilted Unknown
This parameter in the table "Evaluation of the states" defines the state if contact 1 of the window sash is "0". The object polarity can be parameterised in the advanced parameters.	

Leaf/sash (contact 1 = 1)	Open **Closed** Tilted Unknown
This parameter in the table "Evaluation of the states" defines the state if contact 1 of the window sash is "1". The object polarity can be parameterised in the advanced parameters.	

Handle (contact 1 = 0)	**Open** Closed Tilted Unknown
This parameter in the table "Evaluation of the states" defines the state if contact 1 of the window handle is "0". The object polarity can be parameterised in the advanced parameters.	

Handle (contact 1 = 1)	Open **Closed** Tilted Unknown
This parameter in the table "Evaluation of the states" defines the state if contact 1 of the window handle is "1". The object polarity can be parameterised in the advanced parameters.	

Leaf/sash (contact 1 = 0)	**Open** Closed Unknown
This parameter in the table "Evaluation of the states" defines the state if contact 1 of the door leaf is "0". The object polarity can be parameterised in the advanced parameters.	

Leaf/sash (contact 1 = 1)	Open **Closed** Unknown
This parameter in the table "Evaluation of the states" defines the state if contact 1 of the door leaf is "1". The object polarity can be parameterised in the advanced parameters.	

Closure (contact 1 = 0)	Locked **Unlocked** Unknown
This parameter in the table "Evaluation of the states" defines the state if contact 1 of the door closure is "0". The object polarity can be parameterised in the advanced parameters.	

Closure (contact 1 = 1)	**Locked** Unlocked Unknown
This parameter in the table "Evaluation of the states" defines the state if contact 1 of the door closure is "1". The object polarity can be parameterised in the advanced parameters.	

Extended settings	Active **Inactive**
When the advanced parameters are activated, the ETS shows the following parameters. The default values of the advanced parameters are used if the advanced parameters are deactivated.	

Evaluation delay (0 = inactive)	0 ... **1** ... 59 s | **0** ... 990 ms
The door/window status can be evaluated and transmitted after a delay. An evaluation delay of 1 second is activated in the default parameterisation. Visible only if "Advanced parameters = active".	

Additional 1-bit status object	**Active** Inactive
This parameter enables an additional 1-bit status object, which transmits the state of the contact on the bus according to the object polarity. Visible only if "Advanced parameters = active".	

Debounce time	4 ... **30** ... 255 ms
This parameter specifies the software debouncing time. A signal edge is evaluated at the input after a delay based on this time. Visible only if "Advanced parameters = active".	

Object polarity	0 = closed / 1 = open **1 = closed / 0 = open**
This parameter sets the polarity of the contact for adjustment to the NO or NC contacts.	

After the bus voltage returns	**no reaction** transmit current state
This parameter determines the reaction after the bus voltage returns. Either no telegram or a telegram according to the current input state at the channel is transmitted on the bus according to the parameterisation. The reaction after the bus voltage returns takes place only after the parameterised "delay after bus voltage returns" expires ("General" parameter page).	

Send output objects cyclically	Active **Inactive**
The output objects of the "door/window status" channel function can be transmitted cyclically on the bus. This parameter enables the cyclical transmission.	

Cycle time	**0** ... 24 h | 0, **1** ... 59 min | **0** ... 59 s
This parameter defines the interval at which the output objects are transmitted on the bus. The cycle time can be parameterised between 3 seconds and 24 hours.	

Disabling function	**Inactive** Active
This parameter enables the disabling function for the channel.	

At the beginning of the disabling function	**no reaction** Individual settings
Besides disabling the channel, the device can immediately react when the disabling occurs. This parameter defines the reaction of the channel at the beginning of the disabling.	

Wing status	**Open** Closed Tilted Unknown
This parameter defines the state at the beginning of the disabling with the individual setting.	

Handle status	**Open** Closed Tilted Unknown
This parameter defines the state at the beginning of the disabling with the individual setting.	

Wing status	**Open** Closed Unknown
This parameter defines the state at the beginning of the disabling with the individual setting.	

Handle status	Locked Unlocked Unknown
This parameter defines the state at the beginning of the disabling with the individual setting.	

At the end of the disabling function	**no reaction** transmit current state
Besides disabling the channel, the device can immediately react at the end of the disabling. This parameter defines the reaction of the channel at the end of the disabling.	

Object polarity	**0 = enable / 1 = disable** 1 = enable / 0 = disable
This parameter defines the value of the disabling object at which the disabling function is active.	

13.4.2 Object list

The following communication objects are available in the "door/window status" channel function. The name can be adjusted with the "Name" parameter.

<table>
<tr><th>Function</th><th>Name</th><th>Type</th><th>DPT</th><th>Flag</th></tr>
<tr><td>Door/window contact 1 status</td><td>I ... - Output</td><td>1-bit</td><td>1,001</td><td>C, R, -, T, A</td></tr>
<tr><td colspan="5">1-bit object for transmission of an additional 1-bit status. This object transmits the state of the contact according to the object polarity on the bus.
Visible only if the additional 1-bit status object was activated in the parameters.</td></tr>
</table>

<table>
<tr><th>Function</th><th>Name</th><th>Type</th><th>DPT</th><th>Flag</th></tr>
<tr><td>Door/window overall status</td><td>I ... - Output</td><td>2-byte</td><td>---</td><td>C, R, -, T, A</td></tr>
<tr><td colspan="5">2-byte object for transmission of the door/window status.
– Bit 0...2: "0" = undefined, "1" = leaf/sash closed, "2" = leaf/sash tilted, "3" = leaf/sash open
– Bit 3...5: "0" = undefined, "1" = handle closed, "2" = handle tilted, "3" = handle open
– Bit 6...7: "0" = undefined, "1" = closure unlocked, "2" = closure locked
– Bit 8: "0" = no leaf/sash status, "1" leaf/sash used status
– Bit 9: "0" = no handle status, "1" handle used status
– Bit 10: "0" = no closure status, "1" closure used status
– Bit 11: "0" = window, "1" = door
– Bit 12...15: not used</td></tr>
</table>

<table>
<tr><th>Function</th><th>Name</th><th>Type</th><th>DPT</th><th>Flag</th></tr>
<tr><td>Door/window lock</td><td>I ... - Output</td><td>1-bit</td><td>1,003</td><td>C, -, W, -, U</td></tr>
<tr><td colspan="5">1-bit object for activating or deactivating the disabling function. The object polarity can be configured.</td></tr>
</table>

<table>
<tr><th>Function</th><th>Name</th><th>Type</th><th>DPT</th><th>Flag</th></tr>
<tr><td>Door/window number</td><td>I ... - Output</td><td>4-byte</td><td>12,001</td><td>C, R, -, T, A</td></tr>
<tr><td colspan="5">4-byte object for transmission of the door or window number. The door/window number is transmitted on the bus each time the status is changed.
Visible only if the window number or door number was assigned in the parameters.</td></tr>
</table>

13.5 Leakage/condensation sensor

The "leakage/condensation sensor" channel function can be configured for the extension unit inputs. The device can indicate a leakage or condensation alarm in combination with a sensor connected to the channel. In the "leakage/condensation sensor" channel function, the device indicates a leakage or condensation alarm on the bus by means of an output object according to the parameterisation.

The ETS provides the appropriate parameters and up to two communication objects dynamically according to the parameterised function.

i If the "leakage/condensation sensor" channel function is selected, the "debouncing time" of 138 ms is optimally preset on the condensation or leakage sensor.

13.5.1 Table of parameters

The following parameters are available in the "leakage/condensation sensor" channel function.

Debounce time	4 ms ... **138 ms** ... 255 ms
This parameter specifies the software debouncing time. A signal edge is evaluated at the input after a delay based on this time. The debouncing time of 138 ms is optimally adjusted to the dew or leakage sensor. i The debouncing time is to be adjusted or increased in the event of false alarms.	

Object polarity	**1 = trigger / 0 = reset** 0 = trigger / 1 = reset
This parameter defines the value of the switching object at which the channel function is triggered or reset.	

After the bus voltage returns	no reaction **transmit current state**
This parameter determines the reaction after the bus voltage returns. Either no telegram or a telegram according to the current input state at the channel is transmitted on the bus according to the parameterisation. The reaction after the bus voltage returns takes place only after the parameterised "delay after bus voltage returns" expires ("General" parameter page).	

Send switching status cyclically	**Inactive** Active
The switching status of the switch channel output objects can be transmitted cyclically on the bus. This parameter enables the cyclical transmission.	

Cycle time	**0**...24 h | 0...**5**...59 min | **0**...59 s
This parameter defines the interval at which the switching status is transmitted on the bus. The cycle time can be parameterised between 3 seconds and 24 hours.	

Disabling function	**Inactive** Active
This parameter enables the disabling function for the channel.	

At the beginning of the disabling function	**no reaction**
The device does not immediately react when the disabling occurs.	

At the end of the disabling function	**no reaction** transmit current state
Besides disabling the channel, the device can immediately react at the end of the disabling. This parameter defines the reaction of the channel at the end of the disabling.	

Object polarity	**0 = enable / 1 = disable** 1 = enable / 0 = disable
This parameter defines the value of the disabling object at which the disabling function is active.	

13.5.2 Object list

The following communication objects are available in the "leakage/condensation sensor" channel function. The name can be adjusted with the "Name" parameter.

Function	Name	Type	DPT	Flag
Leakage and condensa-tion sensor - Switching	I ... - Output	1-bit	1,001	C, R, -, T, A
1-bit object for transmission of switching telegrams (ON, OFF).				

Function	Name	Type	DPT	Flag
Switching - Disabling	I ... - Input	1-bit	1,003	C, -, W, -, U
1-bit object for activating or deactivating the disabling function. The object polarity can be configured.				

13.6 Temperature sensor

The "temperature sensor" channel function can be configured for input 1. The device can indicate the actual temperature in combination with a sensor Accessories connected to the channel. In the "temperature sensor" channel function, the device indicates an actual temperature on the bus by means of an output object according to the parameterisation.

The ETS provides the appropriate parameters and up to three communication objects dynamically according to the parameterised function.

13.6.1 Table of parameters

The following parameters are available in the "temperature sensor" channel function.

Temperature measurement by	**Connected sensor** Connected sensor and ext. value via bus
The "Temperature measurement by" parameter specifies the sensors used to measure the room temperature. "Connected sensor": The temperature sensor connected to the device channel has been activated. Thus, the actual temperature value is determined only locally on the device. In this configuration, the feedback control will start directly after a device reset. "Connected sensor and ext. value via bus": This setting is used to combine the selected temperature sources. The external temperature is received by means of the "External value" 2-byte object.	

Weighting of the measured values	10% to 90% 20% to 80% 30% to 70% 40% to 60% **50% to 50%** 60% to 40% 70% to 30% 80% to 20% 90% to 10%
The weighting of the measured temperature value of the connected sensor and the external sensor is defined here. That results in an overall value, which will be used for the further interpretation of the room temperature. This parameter is visible only if "Room temperature measurement by = connected sensor and ext. value via bus".	

Connected sensor (0 = inactive)	-12.8...**0**...12.7
Determines the value in Kelvin by which the measured value of the connected sensor is adjusted. This parameter is visible only if the temperature detection system requires a connected sensor.	

External value via bus (0 = inactive)	-12.8...**0**...12.7
Determines the value in Kelvin by which the external sensor's room temperature value is calibrated. This parameter is only visible when the temperature detection system requires an external sensor.	

Transmit actual temperature	**on change** cyclical On change and cyclical
This parameter defines when the device transmits the actual temperature on the bus. According to the parameterisation, the ETS application program provides additional parameters.	

On change by	0.1 ... **0.2** ... 25.5
Determines the size of the value change of the room temperature in Kelvin after which the current value is automatically transmitted to the bus via the "Actual temperature" object.	

Cycle time	0 ... 24 h, 0 ... **15** ... 60 min, 0 ... 60 s
This parameter defines whether and when (in hours, minutes and seconds) the determined room temperature is to be periodically output via the "Actual temperature" object. The cycle time may be within a time frame of 3 seconds to 24 hours.	

Actual temperature without calibration	Active **Inactive**
If necessary, the unadjusted room temperature can be additionally transmitted to the bus as an information value via the object "Actual temperature without adjustment" and, for example, be displayed in visualisations. This parameter enables the corresponding object. i Besides the calibrated actual temperature, the additional object can be used advantageously for visualisation.	

13.6.2 Object list

The following communication objects are available in the "temperature sensor" channel function. The name can be adjusted with the "Name" parameter.

Function	Name	Type	DPT	Flag
Temperature sensor - Actual temperature - Status	I ... - Output	2-byte	9,001	C, R, -, T, A

2-byte object for displaying the actual temperature (room temperature) determined internally. Possible range of values: -99.9 °C to +99.9 °C.

The actual temperature is determined either by the connected sensor or by a combination of the connected sensor and an external value via the bus.

i The output value does not take into account the parameterised values for the calibration.

i The weighting of the measured values "connected sensor and ext. value via bus" is taken into account.

The temperature value is always output in the format "°C".

Function	Name	Type	DPT	Flag
Temperature sensor external value	I ... - Input	2-byte	9,001	C, -, W, -, U

2-byte object used to couple an external KNX room temperature sensor or a room temperature control point. Thus cascading of multiple temperature sensors for room temperature measurement. Possible range of values: -99.9 °C to +99.9 °C.

The temperature value must always be specified in the format "°C".

Function	Name	Type	DPT	Flag
Temperature sensor - Actual temperature without calibration - Status	I ... - Output	2-byte	9,001	C, R, -, T, A

2-byte object for the display of the determined actual temperature. The actual temperature is either determined by the internal sensor or by a combination of the internal sensor with an external temperature.

i The output value takes into account the parameterised values for the calibration.

i The weighting of the measured values "connected sensor and ext. value via bus" is taken into account.

The temperature value is always output in the format "°C".

13.7 Pulse counter

For each channel whose function is set to "pulse counter", the ETS indicates up to 16 communication objects. To an extent, the object data formats are dependent on the set pulse counter function.

In the function as a pulse meter, the device can count the number of pulses at the input of a channel.

As soon as a channel is set to the "pulse meter" function, this channel provides two pulse meters. The main meter and the intermediate meter are controlled equally by the pulses at the input channel, but count independently of each other. Both meters are configured independently of each other on separate parameter pages ("Main meter" and "Intermediate meter").

Synchronisation can be generated for load management. A synchronisation input is implemented by another input. Its output switch object can be linked to a group address on the "Meter query" input communication object, where it receives the synchronisation pulse.

ℹ The prerequisite is that the parameter "Query meter reading via object" is activated.

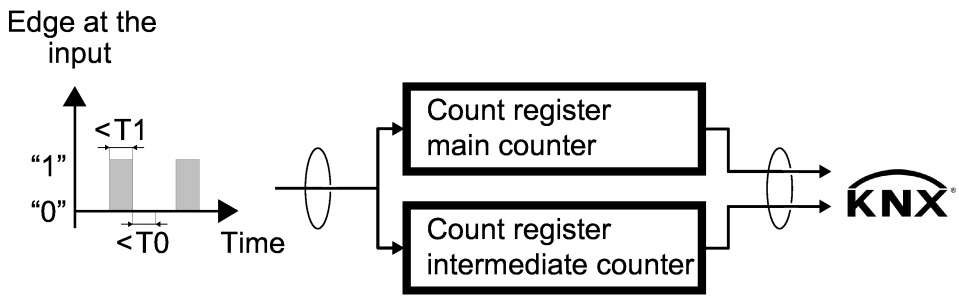


Figure 26: Pulse counter, functional diagram

T0	Minimum signal duration for "0" signals
T1	Minimum signal duration for "1" signals

Function of the pulse counter

The following basic settings for the functionality of the pulse meter are to be configured together for the main and intermediate meters on the parameter page "Extensions -> I … - General". These basic settings cannot differentiate between the main and primary counters.

- Size and interval of the countable value range (parameter "Data point type | Value range")
- Signal evaluation in the device (parameter "Count pulses for")
- Ratio of the pulses output by the pulse generator to the pulses counted in the device ("Change meter reading per" parameter)
- Factor of the meter reading change per counted pulse ("Increment per meter reading change" parameter)

– Debouncing time and minimum signal duration
– Handling the meter reading after the bus voltage returns or ETS download

Size and interval of the countable value range

For each channel whose function is set to "pulse counter", the ETS indicates up to 16 communication objects. Some of the data formats depend on the set data point type | value range of the pulse meter. The parameter "Data point type | Value range" defines the value range of the pulse meter to one of the following sizes and intervals:

– Pulse counter 0...255 (1-byte / KNX DPT 5.010)
– Pulse counter -128...127 (1-byte / KNX DPT 6.010)
– Pulse counter 0...65,535 (2-byte / KNX DPT 7.001)
– Pulse counter -32,768...32,767 (2-byte / KNX DPT 8.001)
– Pulse counter 0...4,294,967,295 (4-byte / KNX DPT 12.001)
– Pulse counter -2,147,483,647...2,147,483,647 (4-byte / KNX DPT 13.001)

The different data point types | value ranges of the pulse meter vary only in terms of the size and interval of the countable value range. The manner in which the pulses are counted is defined through the parameters in the ETS. For this purpose, the ETS provides different parameters that can adjust the function of the pulse meter individually, independently of the set data point type | value range of the pulse meter.

Signal evaluation in the device

The signal evaluation in the device is defined in the ETS. The device can recognise pulses by rising and/or falling edges. The "Count pulses for" parameter defines the edge that starts the signal evaluation in the device. The following settings in the ETS are possible:

– Rising edge
– Falling edge
– Rising and falling edge

Ratio of the pulses output by the pulse generator to the pulses counted in the device

The "Change meter reading per" parameter defines the ratio of the pulses received at the input to the pulses counted in the device. The device works with a configurable debouncing time or minimum signal duration.

Example of setting the pulses at the input per counted pulse:
- "Data point type | value range" = DPT 7.001 | 0...65,535
- "Count pulses for" = rising edge
- "Change meter reading per" = 4 pulses
- "Increment per counter reading change" = 1

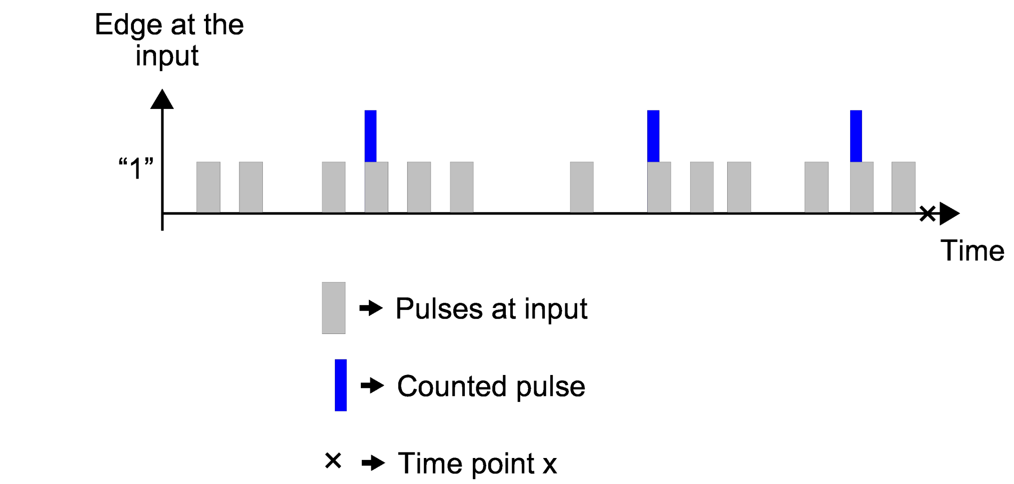


Figure 27: Example of setting the pulses at the input per counted pulse

The device internally counts the meter reading up for each counted pulse (up-counter) or down (down-counter). Thus, in this example the up-counter has a meter reading of 3. At time point x, the communication "... Meter reading" would transmit a "3" on the bus at the time x.

Factor of meter reading change per counter pulse

The "Change meter reading per" parameter defines the factor for the meter reading increase resulting from each counted pulse.

Example of setting the pulses at the input per counted pulse:
- "Data point type | value range" = DPT 7.001 | 0...65,535
- "Count pulses for" = rising edge
- "Change meter reading per" = 2 pulses
- "Increment per counter reading change" = 5

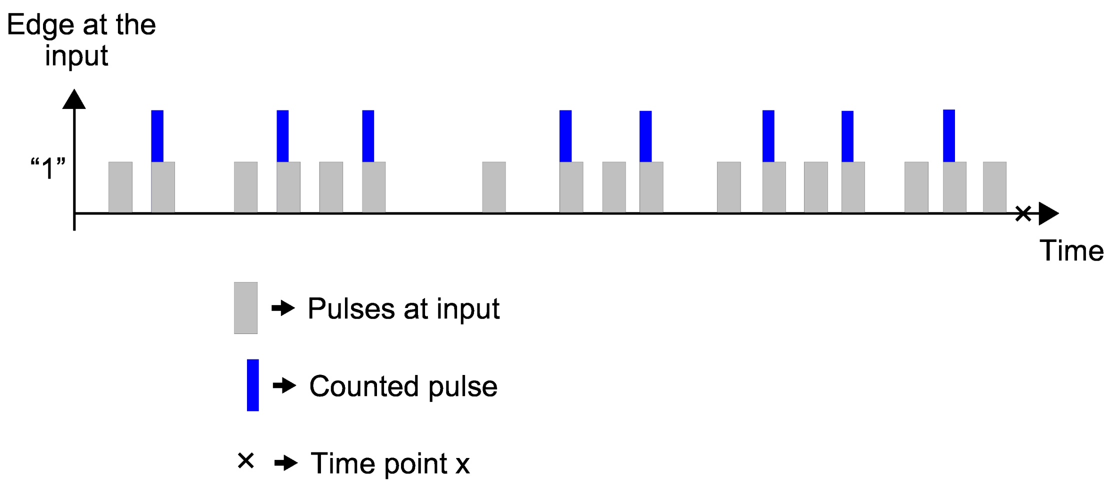


Figure 28: Example for setting the number of changes in counter status per counted pulse

The device internally counts the meter reading up for each counted pulse (up-counter) or down (down-counter). To determine the meter reading, the value of the configured "increment per meter reading change" is multiplied by the number of counted pulses. Thus, in this example an up meter would have a meter reading of "40". The "Change meter reading per" parameter defines the ratio of the pulses received at the input to the pulses counted in the device (17 pulses at the input -> 8 counted pulses). The communication object "... Meter reading" sends a "40" to the KNX at time point x.

Debounce time or minimum signal duration

The parameter "Activate minimum signal duration" decides whether the input is to work with a definable time for the signal debouncing or a minimum signal duration for "0" or "1" signals with the configured pulse meter function.

If "Debounce time" is configured, the input immediately responds to an edge at the input. When the edge is detected at the input, a timer in the device begins to determine the time since the edge was detected. The input does not evaluate any pulses for the configured debounce duration.

If "Minimum signal duration" has been configured, when an edge is detected at the input, a timer in the device begins to determine the time since the detection. The input only evaluates the pulse after the configured minimum signal duration has elapsed. The signal must remain stable during the minimum signal duration.

The debounce time of the signal is defined by the device software via the parameter "Debounce time". When the pulse counter function is configured, the duration which must elapse between two pulses for a valid pulse of the connected contacts to be identified is defined for the input via the debounce time. In this way, it is possible to prevent the device from mistakenly identifying short conduction faults as a pulse. The debounce time makes it possible to adapt the signal evaluation to the contact quality of the connected pulse output also.

Increase the debounce time in the ETS if undesirable pulse evaluations with very fast edge changes resulting in rapidly changing telegram states occur regularly or sporadically.

The parameters "Minimum signal duration for ..." re used to determine the times of the minimum signal duration for "0" and "1" signals by means of the device software. When the pulse counter function is configured, the period during which a pulse must be present until a valid pulse is identified is defined for the input via the minimum signal duration. Different times can be defined for "0" and "1" signals here. In this way, it is possible to prevent the device from mistakenly identifying short conduction faults as a pulse.

Example of setting the minimum signal duration:
- "Data point type | value range" = DPT 7.001 | 0...65,535
- "Count pulses for" = rising edge
- "Change meter reading per" = 1 pulses

Example of setting the minimum signal duration:
- "Increment per counter reading change" = 1

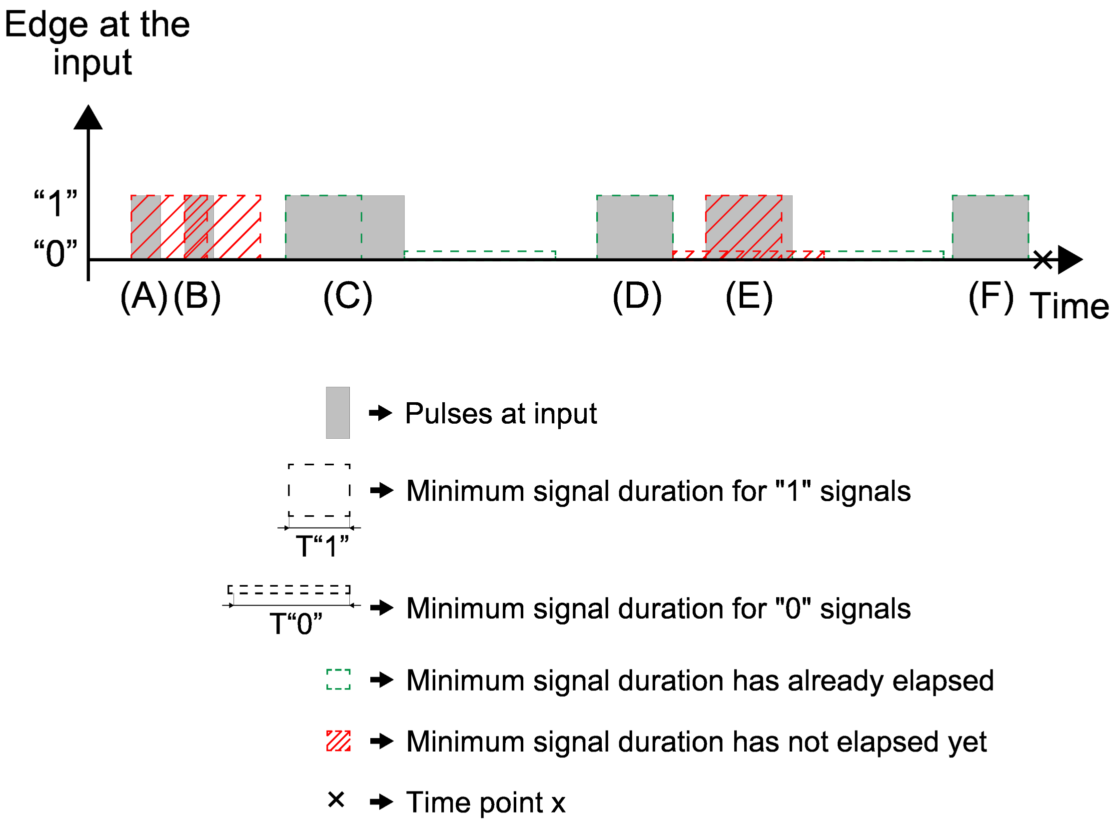


Figure 29: Example of setting the minimum signal duration

(A) The duration of this pulse is shorter than the minimum signal duration defined for "1" signals. This pulse is not identified as a valid pulse by the device.

(B) The duration of this pulse is shorter than the minimum signal duration defined for "1" signals. This pulse is not identified as a valid pulse by the device.

(C) The duration of this pulse is longer than the minimum signal duration defined for "1" signals. This pulse is identified as a valid pulse by the device.

(D) The duration of this pulse is equal to the minimum signal duration defined for "1" signals. The minimum signal duration for "0" signals has already elapsed. This pulse is identified as a valid pulse by the device.

(I) The duration of this pulse is equal to the minimum signal duration defined for "1" signals. However, the minimum signal duration for "0" signals has not elapsed yet. This pulse is not identified as a valid pulse by the device.

(F) The duration of this pulse is equal to the minimum signal duration defined for "1" signals. The minimum signal duration for "0" signals has already elapsed. This pulse is identified as a valid pulse by the device.

The device internally counts the meter reading up for each pulse (up-counter) or down (down-counter). To determine the counter status, the device evaluates the minimum signal duration set for the "0" and "1" signals. In this example, first the minimum signal duration for "0" signals must elapse after a valid pulse has been identified. Only then can the device recognise a "1" signal as a valid pulse again. Thus, in this example the up-counter has a meter reading of 3. At time point x, the communication "... Meter reading" sends a "3" to the KNX at time point x.

Handling the meter reading after the bus voltage returns or ETS download

The "Transmit after bus voltage returns" and "Reset after ETS download" parameters define the behaviour of the device when dealing with the meter readings of the main and intermediate meters.

i The parameter settings are valid until the next time these parameters are adjusted in the ETS. The configured behaviour after bus voltage returns and after an ETS download is taken into account with each ETS download.

Main counter and intermediate counter

The following pulse meter settings are to be configured on the "Main meter" and "Intermediate meter" parameter pages. These settings are to be considered separately for the main and intermediate counters. The functions of the main and intermediate counters are identical except for a few parameter settings and so are described together here. The following parameters are different for the main and intermediate counters:

- "Behaviour after counter status query via KNX"
- "Send meter reading"
- "Behaviour after counter has elapsed"

The counting direction can be separately defined for the main and intermediate counters in the ETS parameters. The meters function as either up- or down-counters. Regardless of counting direction, pulse counting begins at the start value and ends at the end value. The start and end values can be specified for the device via parameter or communication object. The value range in which the start/end values lie is based on the set "data point type | value range" of the pulse meter. When setting via parameter, the start and end values of the pulse counting are specified directly in the ETS. In this case, the preset default value is also oriented to the counter's counting direction. When setting via communication object, communication objects to specify the start and end values are enabled. The data format of the communication objects is oriented to the set function of the pulse counter.

i Condition (up-counter): Start value < End value

i Condition (down-counter): Start value > End value

The communication objects "... Start value" and "... End value" have the value "0" after a programming procedure. Therefore the greater than / less than condition is not satisfied. The meter has stopped and is in interval limit fault state. The interval limit fault is reported to the communication object of the same name on the KNX. As soon as the meter has received valid start and end values, the interval limit fault is cancelled and confirmed with a "0" telegram. The meter is ready for operation. Start and end values can be changed via the communication objects at any time. Parameter "Behaviour after meter has elapsed" defines the behaviour of the meter when the end value received via the communication object is greater or less than (depending on the counting direction) the current meter reading. If there is a power failure or a new programming procedure, the start and end values previously specified via communication object are saved within the device. Once the device restarts, these values are set as start and end values again. Whether the meter readings are transmitted after the bus voltage returns or are reset after a programming procedure is defined by the parameters on the parameter page "Extensions -> I … - General" together for the main and intermediate meters.

i Start and end values specified via communication object also remain saved within the device after a discharge process.

The device can optionally transmit the current meter readings on the KNX in the event of "on change", "cyclical" or "on change and cyclical".

i A counter status change caused by a change of the start or end values does not result in transmission of the counter status. Transmission of the counter status after changes only occurs via the recognition of input pulses.

With the meter reading query function, the device offers another possibility to send the counter status to the KNX. In this case, the device transmits the meter reading only if the counter status is queried by means of a communication object. The "Query meter reading via object" parameter enables the corresponding communication object. This function can be used in parallel with the automatic transmission. The behaviour of the main counter after a counter status query via KNX is permanently defined. The main counter continues to run after the counter status is queried. This is one aspect in which the main counter differs from the intermediate counter. The behaviour of the intermediate counter after a counter status query via KNX can be defined with the same parameters. After a counter status query, the intermediate counter can either continue to run or be reset and restarted. The device transmits the meter reading status before the meter reading is reset and the meter restarted.

i This behaviour is suitable, for example, for a bar chart display in a visualisation used to query the intermediate meter every hour.

When the specified end value is reached, the meter has elapsed. Optionally, an elapsed counter can be reported with a KNX telegram via the communication object "... Elapsed counter report". This communication object is enabled if the "Meter expiry status object" parameter is set to "Active".

Another function which is different between the main and intermediate counters is the behaviour after the counter elapses. The "Behaviour after meter expiry" parameter is permanently set to "Reset meter and restart" on the "Main meter" parameter page. On the "Intermediate meter" parameter page, this parameter decides whether the intermediate counter is to be reset and restarted or remain expired.

In the "Reset meter and restart" setting, the meter counts until the defined end value. Once this end value is reached, the meter reading is reset and the meter begins counting pulses from the defined start value again.

When "Intermediate counter stays elapsed" is set, the intermediate meter counts until the defined end value. Once this end value is reached, the intermediate counter stops counting. The intermediate meter must be reset before it can start counting pulses from the defined start value again. The corresponding communication object "... Counter reset" is enabled by the parameter "Meter reset via object". This parameter is permanently set to "Active" in the "Meter stays elapsed" setting.

i In the same way, the configured "Behaviour after meter has elapsed" defines the behaviour of the meter if the end value received by the communication object is smaller or greater (depending on the counting direction) than the current meter reading.

The meter can be reset via KNX by means of the communication object "... Counter reset" separately for the main and intermediate meter of each input if the "Meter reset via object" parameter is set to "Active". During a meter reset, the meter reading is reset to the start value and the meter is restarted. The function of the communication object "... Counter reset" can be disabled, which allows an unintentional meter reset to be prevented. The communication object, which temporarily disables the possibility to reset the meter, is enabled when the parameter "Reset meter by disabling object" is set to "Active". During the disabled period (polarity of disabling object can be set), KNX telegrams to the communication object "... Counter reset" are ignored and the meter cannot be reset. After the disabling is cancelled by a new KNX telegram with reversed polarity, the meter reading can again be reset.

Overview: Functions of the main and intermediate counters

One channel provides two pulse meters. The main meter and intermediate meter are controlled equally by the pulses at the channel, but count independently of each other. Both meters are configured independently of each other on separate parameter pages ("Main meter" and "Intermediate meter"). Project design of the main and intermediate counters is slightly different.

Function	Main counter	Intermediate counter
Can the data format of the meter be set?	Yes	Yes
Are counter statuses saved if there is a bus voltage failure?	Yes	Yes
Can start and end values can be specified in the parameters?	Yes	Yes
Can start and end values can be specified via communication objects?	Yes	Yes
Can the counting direction be set?	Yes	Yes
Can the meter reading be queried via a KNX communication object?	Yes	Yes

Function	Main counter	Inter-medi-ate counter
Can the behaviour of the counter after a counter status query via KNX be set?	No	Yes
Can the meter reading be independently transmitted by the device?	Yes	Yes
Can the meter reading be reset automatically and the meter restar-ted after the status has been cyclically transmitted?	No	Yes
Can an elapsed counter be reported via a KNX telegram?	Yes	Yes
Can the behaviour of the counter after it has elapsed be defined?	No	Yes
Can the meter be reset and restarted with a KNX telegram?	Yes	Yes

13.7.1 Table of parameters

The following parameters are available in the "pulse meter" channel function on the parameter page "I … - General" .

Data point type | Value range	DPT 5.010 | 0...255 DPT 6.010 | -128...127 **DPT 7.001 | 0...65,535** DPT 8.001 | -32,768...32,767 DPT 12.001 | 0...4,294,967,295 DPT 13.001 | -2,147,483,648...2,147,483,647
This parameter defines the value range of the pulse meter. The size and interval of the counting range are set in dependence on this setting.	

Count pulses on	**Rising edge** Falling edge Rising and falling edge
The device can recognise pulses by rising and/or falling edges. This parameter specifies the edge which starts signal evaluation in the device.	

Change meter reading per	**1** ... 10000 pulses
This parameter defines the ratio of pulses received at the input to the pulses counted in the device. The number of valid pulses specified here must be detected at the device input so the pulse counter can count a pulse.	

Increment per counter reading change	**1** ... 10000
This parameter defines the factor for the meter reading change resulting from each counted pulse. The change in counter status is yielded by multiplying the factor entered here with the pulses counted by the pulse counter.	

Activate minimum signal duration	Active **Inactive**
This parameter decides whether the channel is to work with a definable time for the signal debouncing or a minimum signal duration for "0" or "1" signals with the configured pulse meter function. In the "active" setting, additional parameters that define the minimum signal duration for "0" and "1" signals become visible. In the "inactive" setting, the device works with a debouncing time in milliseconds defined by the parameter of the same name.	

For "0" signal	**0** ... 59 min | **0** ... 59 s | 15 ... **100** ... 999 ms
This parameter defines the time of the minimum signal duration for "0" signals. When the pulse counter function is configured, the period during which a pulse must be present until a valid pulse is identified is defined for the input via the minimum signal duration. A minimum signal duration of 0 min | 0 s | 15 ms to 59 min | 59 s | 999 ms can be set.	

For "1" signal	**0** ... 59 min | **0** ... 59 s | 15 ... **100** ... 999 ms
This parameter defines the time of the minimum signal duration for "1" signals. When the pulse counter function is configured, the period during which a pulse must be present until a valid pulse is identified is defined for the input via the minimum signal duration. A minimum signal duration of 0 min | 0 s | 15 ms to 59 min | 59 s | 999 ms can be set.	

Debounce time	4 ... **10** ... 255 ms
This parameter defines the signal debouncing time by means of the device software. With the configured pulse meter function, the pulse duration after which a valid pulse of the connected contacts is identified is defined for the input by the debouncing time.	

Transmit after bus voltage returns	Active **Inactive**
This parameter defines the behaviour of the device when handling the counter statuses of the main and intermediate counters. In the "active" setting, the current meter readings after the bus voltage returns are automatically transmitted on the KNX by means of the "Main meter reading" and "Intermediate meter reading" communication objects.	

Reset after ETS download	Active **Inactive**
This parameter defines the behaviour of the device when handling the counter statuses of the main and intermediate counters. In the "active" setting, the current meter readings are reset due to an ETS download.	

The following parameters are available in the "pulse meter" channel function on the "Main meter" parameter page.

Counting direction	**Forwards** Backwards
The meter functions as either an up- or down-counter. This parameter defines the counting direction. The counting range is determined by the functionality of the pulse meter and by the start and end values specified for the main meter.	

Start value specification	**Via parameter** via group object

Regardless of counting direction, pulse counting begins at the start value and ends at the end value. The start and end values can be specified for the device via parameter or communication object. Depending on this setting, the ETS provides either a parameter or a communication object for specifying the start value.

The value range in which the start and end value lie is based on the set "data point type | value range" of the pulse meter.

> ℹ Condition (up meter): start value < end value condition (down meter): start value > end value

Start value	**0** ... 254

When setting via parameter, the start value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction.

This value range is available when the meter counts up.

The start value can lie within this value range if "DPT 5.010 | 0...255" is set.

Start value	1 ... **255**

When setting via parameter, the start value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction.

This value range is available when the meter counts down.

The start value can lie within this value range if "DPT 5.010 | 0...255" is set.

Start value	-128 ... **0** ... 126

When setting via parameter, the start value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction.

This value range is available when the meter counts up.

The start value can lie within this value range if "DPT 6.010 | -128...127" is set.

Start value	-127 ... **127**

When setting via parameter, the start value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction.

This value range is available when the meter counts down.

The start value can lie within this value range if "DPT 6.010 | -128...127" is set.

Start value	0 ... 65534
When setting via parameter, the start value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts up. The start value can lie within this value range if "DPT 7.001 | 0...65,535" is set.	

Start value	1 ... 65535
When setting via parameter, the start value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts down. The start value can lie within this value range if "DPT 7.001 | 0...65,535" is set.	

Start value	-32768 ... 0 ... 32766
When setting via parameter, the start value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts up. The start value can lie within this value range if "DPT 8.001 | -32,768...32,767" is set.	

Start value	-32767 ... 32767
When setting via parameter, the start value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts down. The start value can lie within this value range if "DPT 8.001 | -32,768...32,767" is set.	

Start value	0 ... 4294967294
When setting via parameter, the start value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts up. The start value can lie within this value range if "DPT 12.001 | 0...4,294,967,295" is set.	

Start value	1 ... 4294967295
When setting via parameter, the start value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts down. The start value can lie within this value range if "DPT 12.001 | 0...4,294,967,295" is set.	

Start value	-2147483648 ... **0** ... 2147483646
When setting via parameter, the start value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts up. The start value can lie within this value range if "DPT 13.001 | -2,147,483,648...2,147,483,647" is set.	

Start value	-2147483647 ... **2147483647**
When setting via parameter, the start value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts down. The start value can lie within this value range if "DPT 13.001 | -2,147,483,648...2,147,483,647" is set.	

End value specification	**Via parameter** via group object
Regardless of counting direction, pulse counting begins at the start value and ends at the end value. The start and end values can be specified for the device via parameter or communication object. Depending on this setting, the ETS provides either a parameter or a communication object for specifying the end value. The value range in which the start and end value lie is based on the set "data point type | value range" of the pulse meter. i Condition (up meter): start value < end value condition (down meter): start value > end value	

End value	1 ... **255**
When setting via parameter, the end value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts up. The end value can lie within this value range if "DPT 5.010 | 0...255" is set.	

End value	**0** ... 254
When setting via parameter, the end value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts down. The end value can lie within this value range if "DPT 5.010 | 0...255" is set.	

End value	-127 ... **127**
When setting via parameter, the end value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts up. The end value can lie within this value range if "DPT 6.010 | -128...127" is set.	

End value	-128 ... **0** ... 126
When setting via parameter, the end value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts down. The end value can lie within this value range if "DPT 6.010 | -128...127" is set.	

End value	1 ... **65535**
When setting via parameter, the end value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts up. The end value can lie within this value range if "DPT 7.001 | 0...65,535" is set.	

End value	**0** ... 65534
When setting via parameter, the end value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts down. The end value can lie within this value range if "DPT 7.001 | 0...65,535" is set.	

End value	-32767 ... **32767**
When setting via parameter, the end value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts up. The end value can lie within this value range if "DPT 8.001 | -32,768...32,767" is set.	

End value	-32768 ... **0** ... 32766
When setting via parameter, the end value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts down. The end value can lie within this value range if "DPT 8.001 | -32,768...32,767" is set.	

End value	1 ... **4294967295**
When setting via parameter, the end value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts up. The end value can lie within this value range if "DPT 12.001 | 0...4,294,967,295" is set.	

End value	**0** ... 4294967294
When setting via parameter, the end value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts down. The end value can lie within this value range if "DPT 12.001 | 0...4,294,967,295" is set.	

End value	-2147483647 ... **2147483647**
When setting via parameter, the end value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts up. The end value can lie within this value range if "DPT 13.001 | -2,147,483,648...2,147,483,647" is set.	

End value	-2147483648 ... **0** ... 2147483646
When setting via parameter, the end value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts down. The end value can lie within this value range if "DPT 13.001 | -2,147,483,648...2,147,483,647" is set.	

Query meter reading via object	Active **Inactive**
With the meter reading query function, the device offers another possibility to send the counter status to the KNX. In this case, the device transmits the meter reading only if the counter status is queried by means of a communication object. This parameter enables the corresponding communication object. This function can be used in parallel with the automatic transmission.	

Behaviour after counter expiry	**Reset meter and restart**
This parameter is permanently set to "Reset meter and restart". Correspondingly, the main counter is reset and restarted after the counter has elapsed. In the same way, the configured "Behaviour after meter has elapsed" defines the behaviour of the meter when the end value received via the communication object is greater or less than (depending on the counting direction) the current meter reading.	

Status object ""Counter expiry""	Active **Inactive**
Optionally, the expiry of a meter can be reported with a KNX telegram by means of the "meter expiry" communication object. This communication object becomes available when this parameter is set to "active".	

Counter reset via object	Active **Inactive**
The meter reset via KNX can be set separately by means of the "meter reset" communication object for the main and intermediate meter of each input if this parameter is set to "active". When a meter is reset, the meter reading is reset to the start value and restarted.	

Reset meter by disabling object	Active **Inactive**
The function of the "meter reset" communication object can be disabled. The communication object, which temporarily disables the possibility to reset a meter, is enabled if this parameter is set to "active".	

Object polarity	**1 = disable / 0 = enable** 0 = disable / 1 = enable
The polarity of the disabling object for the meter reset can be set with this parameter.	

Send meter reading	**on change** cyclical On change and cyclical
This parameter defines the criterion for automatic transmission of the counter status. Additional parameters are displayed depending on this setting.	

On change by	1 ... **100** ... 65535 (255, 127, 32767, ...)
If the meter reading is to be transmitted after changing, this parameter defines the exact value by which the meter reading needs to have changed for the device to transmit the current meter reading again. The value range of this parameter is based on the set "data point type | value range" of the pulse meter. This parameter is visible when the meter reading is sent "For change" or "For change and cyclical".	

Cycle time	**0** ... 24 h | 0 ... **5** ... 59 min| 0 ... **10** ... 59 s
The device always transmits the meter reading cyclically after the time defined in the parameters has elapsed. The sum resulting from the parameters for minutes, seconds and milliseconds yields the total cycle time. This parameter is visible when the meter reading is sent "Cyclically" or "For change and cyclically". A cycle time of 3 s to 24 h can be set.	

The following parameters are available in the "Pulse meter" channel function on the "Intermediate meter" parameter page.

Counting direction	**Forwards** Backwards
The meter functions as either an up- or down-counter. This parameter defines the counting direction. The counting range is determined by the functionality of the pulse meter and the start and end values specified for the intermediate meter.	

Start value specification	**Via parameter** via group object
Regardless of counting direction, pulse counting begins at the start value and ends at the end value. The start and end values can be specified for the device via parameter or communication object. Depending on this setting, the ETS provides either a parameter or a communication object for specifying the start value. The value range in which the start and end value lie is based on the set "data point type | value range" of the pulse meter. i Condition (up meter): start value < end value condition (down meter): start value > end value	

Start value	**0** ... 254
When setting via parameter, the start value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts up. The start value can lie within this value range if "DPT 5.010 | 0...255" is set.	

Start value	1 ... **255**
When setting via parameter, the start value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts down. The start value can lie within this value range if "DPT 5.010 | 0...255" is set.	

Start value	-128 ... **0** ... 126
When setting via parameter, the start value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts up. The start value can lie within this value range if "DPT 6.010 | -128...127" is set.	

Start value	-127 ... **127**
When setting via parameter, the start value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts down. The start value can lie within this value range if "DPT 6.010 | -128...127" is set.	

Start value	**0** ... 65534
When setting via parameter, the start value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts up. The start value can lie within this value range if "DPT 7.001 | 0...65,535" is set.	

Start value	1 ... **65535**
When setting via parameter, the start value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts down. The start value can lie within this value range if "DPT 7.001 | 0...65,535" is set.	

Start value	-32768 ... **0** ... 32766
When setting via parameter, the start value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts up. The start value can lie within this value range if "DPT 8.001 | -32,768...32,767" is set.	

Start value	-32767 ... **32767**
When setting via parameter, the start value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts down. The start value can lie within this value range if "DPT 8.001 | -32,768...32,767" is set.	

Start value	**0** ... 4294967294
When setting via parameter, the start value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts up. The start value can lie within this value range if "DPT 12.001 | 0...4,294,967,295" is set.	

Start value	1 ... **4294967295**

When setting via parameter, the start value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction.

This value range is available when the meter counts down.

The start value can lie within this value range if "DPT 12.001 | 0...4,294,967,295" is set.

Start value	-2147483648 ... **0** ... 2147483646

When setting via parameter, the start value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction.

This value range is available when the meter counts up.

The start value can lie within this value range if "DPT 13.001 | -2,147,483,648...2,147,483,647" is set.

Start value	-2147483647 ... **2147483647**

When setting via parameter, the start value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction.

This value range is available when the meter counts down.

The start value can lie within this value range if "DPT 13.001 | -2,147,483,648...2,147,483,647" is set.

End value specification	**Via parameter** via group object

Regardless of counting direction, pulse counting begins at the start value and ends at the end value. The start and end values can be specified for the device via parameter or communication object. Depending on this setting, the ETS provides either a parameter or a communication object for specifying the end value.

The value range in which the start and end value lie is based on the set "data point type | value range" of the pulse meter.

i Condition (up meter): start value < end value condition (down meter): start value > end value

End value	1 ... **255**

When setting via parameter, the end value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction.

This value range is available when the meter counts up.

The end value can lie within this value range if "DPT 5.010 | 0...255" is set.

End value	0 ... 254
When setting via parameter, the end value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts down. The end value can lie within this value range if "DPT 5.010 | 0...255" is set.	

End value	-127 ... 127
When setting via parameter, the end value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts up. The end value can lie within this value range if "DPT 6.010 | -128...127" is set.	

End value	-128 ... 0 ... 126
When setting via parameter, the end value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts down. The end value can lie within this value range if "DPT 6.010 | -128...127" is set.	

End value	1 ... 65535
When setting via parameter, the end value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts up. The end value can lie within this value range if "DPT 7.001 | 0...65,535" is set.	

End value	0 ... 65534
When setting via parameter, the end value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts down. The end value can lie within this value range if "DPT 7.001 | 0...65,535" is set.	

End value	-32767 ... 32767
When setting via parameter, the end value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction. This value range is available when the meter counts up. The end value can lie within this value range if "DPT 8.001 | -32,768...32,767" is set.	

End value	-32768 ... **0** ... 32766

When setting via parameter, the end value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction.

This value range is available when the meter counts down.

The end value can lie within this value range if "DPT 8.001 | -32,768...32,767" is set.

End value	1 ... **4294967295**

When setting via parameter, the end value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction.

This value range is available when the meter counts up.

The end value can lie within this value range if "DPT 12.001 | 0...4,294,967,295" is set.

End value	**0** ... 4294967294

When setting via parameter, the end value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction.

This value range is available when the meter counts down.

The end value can lie within this value range if "DPT 12.001 | 0...4,294,967,295" is set.

End value	-2147483647 ... **2147483647**

When setting via parameter, the end value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction.

This value range is available when the meter counts up.

The end value can lie within this value range if "DPT 13.001 | -2,147,483,648...2,147,483,647" is set.

End value	-2147483648 ... **0** ... 2147483646

When setting via parameter, the end value of the pulse counting is specified directly with this parameter. In this case, the preset default value is also oriented to the counter's counting direction.

This value range is available when the meter counts down.

The end value can lie within this value range if "DPT 13.001 | -2,147,483,648...2,147,483,647" is set.

Query meter reading via object	Active **Inactive**
With the meter reading query function, the device offers another possibility to send the counter status to the KNX. In this case, the device transmits the meter reading only if the counter status is queried by means of a communication object. This parameter enables the corresponding communication object. This function can be used in parallel with the automatic transmission.	

Behaviour	**Counter continues to run** Reset counter and restart
The behaviour of the intermediate meter after querying a meter reading by means of an object can be defined. After a counter status query, the intermediate counter can either continue to run or be reset and restarted. The device transmits the meter reading status before the meter reading is reset and the meter restarted.	

Behaviour after counter expiry	**Counter remains expired (reset required)** Reset counter and restart
This parameter defines whether the intermediate counter is reset and restarted after it elapses or if it stays elapsed. In the "Reset meter and restart" setting, the meter counts until the defined end value is reached. Once this end value is reached, the meter reading is reset and the meter begins counting pulses from the defined start value again. In the "Meter remains elapsed (reset required)" setting, the intermediate meter counts until the defined end value is reached. Once this end value is reached, the intermediate counter stops counting. The intermediate meter must be reset before it can start counting pulses from the defined start value again. The "Meter reset via object" parameter is permanently set to "active" in the "Meter stays elapsed" setting. In the same way, the configured "Behaviour after meter has elapsed" defines the behaviour of the meter if the end value received by the communication object is smaller or greater (depending on the counting direction) than the current meter reading.	

Status object ""Counter expiry""	Active **Inactive**
Optionally, the expiry of a meter can be reported with a KNX telegram by means of the "meter expiry" communication object. This communication object becomes available when this parameter is set to "active".	

Counter reset via object	Active **Inactive**
The meter reset via KNX can be set separately by means of the "meter reset" communication object for the main and intermediate meter of each input if this parameter is set to "active". When a meter is reset, the meter reading is reset to the start value and restarted.	

Reset meter by disabling object	Active **Inactive**
The function of the "meter reset" communication object can be disabled. The communication object, which temporarily disables the possibility to reset a meter, is enabled if this parameter is set to "active".	

Object polarity	**1 = disable / 0 = enable** 0 = disable / 1 = enable
The polarity of the disabling object for the meter reset can be set with this parameter.	

Send meter reading	on change cyclical On change and cyclical
This parameter defines the criterion for automatic transmission of the counter status. Additional parameters are displayed depending on this setting.	

On change by	1 ... 100 ... 65535 (255, 127, 32767, ...)
If the meter reading is to be transmitted after changing, this parameter defines the exact value by which the meter reading needs to have changed for the device to transmit the current meter reading again. The value range of this parameter is based on the set "data point type | value range" of the pulse meter. This parameter is visible when the meter reading is sent "For change" or "For change and cyclical".	

Cycle time	**0** ... 24 h | 0 ... **5** ... 59 min| 0 ... **10** ... 59 s
The device always transmits the meter reading cyclically after the time defined in the parameters has elapsed. The sum resulting from the parameters for minutes, seconds and milliseconds yields the total cycle time. This parameter is visible when the meter reading is sent "Cyclically" or "For change and cyclically". A cycle time of 3 s to 24 h can be set.	

13.7.2 Object list

The following communication objects are available for the main meter in the "pulse meter" channel function. The name can be adjusted with the "Name" parameter.

Function	Name	Type	DPT	Flag
Main counter expiry	I ... - Output	1-bit	1,002	C, R, -, T, A
This 1-bit object reports that the main counter has elapsed to the KNX. Visible only if the "Meter expiry status object" parameter is set to "active".				

Function	Name	Type	DPT	Flag
Main counter interval limit error	I ... - Output	1-bit	1,002	C, R, -, T, A
This 1-bit object reports a main counter interval limit fault to the KNX. An interval limit error is transmitted if: - Up meter: start value >= end value, - Down meter: start value <= end value. The interval limit fault is also read out if the communication objects "start value" and "end value" have not yet received a valid value telegram via the KNX.				

Function	Name	Type	DPT	Flag
Puls counter - main meter - meter reading - query	I ... - Input	1-bit	1,017	C, -, W, -, U
1-bit object for querying the current main counter status. If this object is defined with a "1" telegram, the device transmits the current meter reading to the KNX. This communication object is visible only if the "Query meter reading via object" parameter is set to "active".				

Function	Name	Type	DPT	Flag
Main counter reset	I ... - Input	1-bit	1,015	C, -, W, -, U
1-bit object for resetting the current main counter status. If this object is defined with a "1" telegram, the meter reading is reset to the start value that was configured or specified via an object. This communication object is visible only if the "Meter reset via object" parameter is set to "active".				

Function	Name	Type	DPT	Flag
Puls counter - main meter - meter reading - status	I ... - Output	1-byte	5,010	C, R, -, T, A
This 1-bit object automatically transmits the current meter reading of the main meter on the KNX (after a change or cyclically). The meter reading can be read out via the KNX if the R-flag is set. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...255 here).				

Function	Name	Type	DPT	Flag
Puls counter - main meter - meter reading - status	I ... - Output	1-byte	6,010	C, R, -, T, A
This 1-bit object automatically transmits the current meter reading of the main meter on the KNX (after a change or cyclically). The meter reading can be read out via the KNX if the R-flag is set. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -128...127 here).				

Function	Name	Type	DPT	Flag
Puls counter - main meter - meter reading - status	I ... - Output	2-byte	7,001	C, R, -, T, A
This 2-bit object automatically transmits the current meter reading of the main meter on the KNX (after a change or cyclically). The meter reading can be read out via the KNX if the R-flag is set. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...65535 here).				

Function	Name	Type	DPT	Flag
Puls counter - main meter - meter reading - status	I ... - Output	2-byte	8,001	C, R, -, T, A
This 2-bit object automatically transmits the current meter reading of the main meter on the KNX (after a change or cyclically). The meter reading can be read out via the KNX if the R-flag is set. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -32768...32767 here).				

Function	Name	Type	DPT	Flag
Puls counter - main meter - meter reading - status	I ... - Output	4-byte	12,001	C, R, -, T, A
This 4-bit object automatically transmits the current meter reading of the main meter on the KNX (after a change or cyclically). The meter reading can be read out via the KNX if the R-flag is set. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...4294967295 here).				

Function	Name	Type	DPT	Flag
Puls counter - main meter - meter reading - status	I ... - Output	4-byte	13,001	C, R, -, T, A

This 4-bit object automatically transmits the current meter reading of the main meter on the KNX (after a change or cyclically).

The meter reading can be read out via the KNX if the R-flag is set. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -2147483648...2147483647 here).

Function	Name	Type	DPT	Flag
Main counter start value	I ... - Input	1-byte	5,010	C, -, W, -, U

If the main counter is working as an up-counter, the input receives the start value of the main counter via this communication object. This object is visible if the "Start value specification" parameter is set to "Via communication object".

As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...255 here).

Function	Name	Type	DPT	Flag
Main counter start value	I ... - Input	1-byte	6,010	C, -, W, -, U

If the main counter is working as an up-counter, the input receives the start value of the main counter via this communication object. This object is visible if the "Start value specification" parameter is set to "Via communication object".

As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -128...127 here).

Function	Name	Type	DPT	Flag
Main counter start value	I ... - Input	2-byte	7,001	C, -, W, -, U

If the main counter is working as an up-counter, the input receives the start value of the main counter via this communication object. This object is visible if the "Start value specification" parameter is set to "Via communication object".

As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...65535 here).

Function	Name	Type	DPT	Flag
Main counter start value	I ... - Input	2-byte	8,001	C, -, W, -, U

If the main counter is working as an up-counter, the input receives the start value of the main counter via this communication object. This object is visible if the "Start value specification" parameter is set to "Via communication object".

As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -32768...32767 here).

Function	Name	Type	DPT	Flag
Main counter start value	I ... - Input	4-byte	12,001	C, -, W, -, U

If the main counter is working as an up-counter, the input receives the start value of the main counter via this communication object. This object is visible if the "Start value specification" parameter is set to "Via communication object".

As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...4294967295 here).

Function	Name	Type	DPT	Flag
Main counter start value	I ... - Input	4-byte	13,001	C, -, W, -, U

If the main counter is working as an up-counter, the input receives the start value of the main counter via this communication object. This object is visible if the "Start value specification" parameter is set to "Via communication object".

As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -2147483648...2147483647 here).

Function	Name	Type	DPT	Flag
Main counter end value	I ... - Input	1-byte	5,010	C, -, W, -, U

If the main counter is working as an up-counter, the input receives the end value of the main counter via this communication object. This object is visible when parameter "End value specification" is set to "Via communication object".

As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...255 here).

Function	Name	Type	DPT	Flag
Main counter end value	I ... - Input	1-byte	6,010	C, -, W, -, U

If the main counter is working as an up-counter, the input receives the end value of the main counter via this communication object. This object is visible when parameter "End value specification" is set to "Via communication object".

As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -128...127 here).

Function	Name	Type	DPT	Flag
Main counter end value	I ... - Input	2-byte	7,001	C, -, W, -, U

If the main counter is working as an up-counter, the input receives the end value of the main counter via this communication object. This object is visible when parameter "End value specification" is set to "Via communication object".

As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...65535 here).

Function	Name	Type	DPT	Flag
Main counter end value	I ... - Input	2-byte	8,001	C, -, W, -, U
If the main counter is working as an up-counter, the input receives the end value of the main counter via this communication object. This object is visible when parameter "End value specification" is set to "Via communication object". As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -32768...32767 here).				

Function	Name	Type	DPT	Flag
Main counter end value	I ... - Input	4-byte	12,001	C, -, W, -, U
If the main counter is working as an up-counter, the input receives the end value of the main counter via this communication object. This object is visible when parameter "End value specification" is set to "Via communication object". As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...4294967295 here).				

Function	Name	Type	DPT	Flag
Main counter end value	I ... - Input	4-byte	13,001	C, -, W, -, U
If the main counter is working as an up-counter, the input receives the end value of the main counter via this communication object. This object is visible when parameter "End value specification" is set to "Via communication object". As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -2147483648...2147483647 here).				

Function	Name	Type	DPT	Flag
Main counter end value	I ... - Input	1-byte	5,010	C, -, W, -, U
If the main counter is working as a down-counter, the input receives the end value of the main counter via this communication object. This object is visible when parameter "End value specification" is set to "Via communication object". As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...255 here).				

Function	Name	Type	DPT	Flag
Main counter end value	I ... - Input	1-byte	6,010	C, -, W, -, U
If the main counter is working as a down-counter, the input receives the end value of the main counter via this communication object. This object is visible when parameter "End value specification" is set to "Via communication object". As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -128...127 here).				

Function	Name	Type	DPT	Flag
Main counter end value	I ... - Input	2-byte	7,001	C, -, W, -, U

If the main counter is working as a down-counter, the input receives the end value of the main counter via this communication object. This object is visible when parameter "End value specification" is set to "Via communication object".

As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...65535 here).

Function	Name	Type	DPT	Flag
Main counter end value	I ... - Input	2-byte	8,001	C, -, W, -, U

If the main counter is working as a down-counter, the input receives the end value of the main counter via this communication object. This object is visible when parameter "End value specification" is set to "Via communication object".

As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -32768...32767 here).

Function	Name	Type	DPT	Flag
Main counter end value	I ... - Input	4-byte	12,001	C, -, W, -, U

If the main counter is working as a down-counter, the input receives the end value of the main counter via this communication object. This object is visible when parameter "End value specification" is set to "Via communication object".

As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...4294967295 here).

Function	Name	Type	DPT	Flag
Main counter end value	I ... - Input	4-byte	13,001	C, -, W, -, U

If the main counter is working as a down-counter, the input receives the end value of the main counter via this communication object. This object is visible when parameter "End value specification" is set to "Via communication object".

As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -2147483648...2147483647 here).

Function	Name	Type	DPT	Flag
Main counter start value	I ... - Input	1-byte	5,010	C, -, W, -, U

If the main counter is working as a down-counter, the input receives the start value of the main counter via this communication object. This object is visible if the "Start value specification" parameter is set to "Via communication object".

As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...255 here).

Function	Name	Type	DPT	Flag
Main counter start value	I ... - Input	1-byte	6,010	C, -, W, -, U

If the main counter is working as a down-counter, the input receives the start value of the main counter via this communication object. This object is visible if the "Start value specification" parameter is set to "Via communication object".

As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -128...127 here).

Function	Name	Type	DPT	Flag
Main counter start value	I ... - Input	2-byte	7,001	C, -, W, -, U

If the main counter is working as a down-counter, the input receives the start value of the main counter via this communication object. This object is visible if the "Start value specification" parameter is set to "Via communication object".

As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...65535 here).

Function	Name	Type	DPT	Flag
Main counter start value	I ... - Input	2-byte	8,001	C, -, W, -, U

If the main counter is working as a down-counter, the input receives the start value of the main counter via this communication object. This object is visible if the "Start value specification" parameter is set to "Via communication object".

As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (here: pulse meter -32768...32767).

Function	Name	Type	DPT	Flag
Main counter start value	I ... - Input	4-byte	12,001	C, -, W, -, U

If the main counter is working as a down-counter, the input receives the start value of the main counter via this communication object. This object is visible if the "Start value specification" parameter is set to "Via communication object".

As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...4294967295 here).

Function	Name	Type	DPT	Flag
Main counter start value	I ... - Input	4-byte	13,001	C, -, W, -, U

If the main counter is working as a down-counter, the input receives the start value of the main counter via this communication object. This object is visible if the "Start value specification" parameter is set to "Via communication object".

As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -2147483648...2147483647 here).

Function	Name	Type	DPT	Flag
Main counter disable reset function	I ... - Input	1-bit	1,003	C, -, W, -, U
Reset of the current main counter status can be disabled via this object. If the "Reset meter by disabling object" parameter is set to "active", the meter reset function can be disabled by this object even if it is enabled in the parameters. During the time it is disabled, the meter cannot be reset. The polarity of the object is defined by the "Object polarity" parameter in the process.				

The following communication objects are available for the intermediate meter in the "pulse meter" channel function. The name can be adjusted with the "Name" parameter.

Function	Name	Type	DPT	Flag
Intermediate counter expiry	I ... - Output	1-bit	1,002	C, R, -, T, A
This 1-bit object reports that the intermediate counter has elapsed to the KNX. Visible only if the "Meter expiry status object" parameter is set to "active".				

Function	Name	Type	DPT	Flag
Intermediate counter interval limit error	I ... - Output	1-bit	1,002	C, R, -, T, A
This 1-bit object reports an intermediate counter interval limit fault to the KNX. An interval limit error is transmitted if: - Up meter: start value >= end value, - Down meter: start value <= end value. The interval limit fault is also read out if the communication objects "start value" and "end value" have not yet received a valid value telegram via the KNX.				

Function	Name	Type	DPT	Flag
Puls counter - intermediate meter - meter reading - query	I ... - Input	1-bit	1,017	C, -, W, -, U
1-bit object for querying the current intermediate counter status. If this object is defined with a "1" telegram, the device transmits the current meter reading to the KNX. This communication object is visible only if the "Query meter reading via object" parameter is set to "active".				

Function	Name	Type	DPT	Flag
Intermediate counter reset	I ... - Input	1-bit	1,015	C, -, W, -, U
1-bit object for resetting the intermediate counter. If this object is defined with a "1" telegram, the meter reading is reset to the start value that was configured or specified via an object. This communication object is visible only if the "Meter reset via object" parameter is set to "active".				

Function	Name	Type	DPT	Flag
Puls counter - intermediate meter - meter reading - status	I ... - Output	1-byte	5,010	C, R, -, T, A

This 1-bit object automatically transmits the current meter reading of the intermediate meter on the KNX (after a change or cyclically).

The meter reading can be read out via the KNX if the R-flag is set. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...255 here).

Function	Name	Type	DPT	Flag
Puls counter - intermediate meter - meter reading - status	I ... - Output	1-byte	6,010	C, R, -, T, A

This 1-bit object automatically transmits the current meter reading of the intermediate meter on the KNX (after a change or cyclically).

The meter reading can be read out via the KNX if the R-flag is set. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -128...127 here).

Function	Name	Type	DPT	Flag
Puls counter - intermediate meter - meter reading - status	I ... - Output	2-byte	7,001	C, R, -, T, A

This 2-bit object automatically transmits the current meter reading of the intermediate meter on the KNX (after a change or cyclically).

The meter reading can be read out via the KNX if the R-flag is set. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...65535 here).

Function	Name	Type	DPT	Flag
Puls counter - intermediate meter - meter reading - status	I ... - Output	2-byte	8,001	C, R, -, T, A

This 2-bit object automatically transmits the current meter reading of the intermediate meter on the KNX (after a change or cyclically).

The meter reading can be read out via the KNX if the R-flag is set. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -32768...32767 here).

Function	Name	Type	DPT	Flag
Puls counter - intermediate meter - meter reading - status	I ... - Output	4-byte	12,001	C, R, -, T, A
This 4-bit object automatically transmits the current meter reading of the intermediate meter on the KNX (after a change or cyclically). The meter reading can be read out via the KNX if the R-flag is set. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...4294967295 here).				

Function	Name	Type	DPT	Flag
Puls counter - intermediate meter - meter reading - status	I ... - Output	4-byte	13,001	C, R, -, T, A
This 4-bit object automatically transmits the current meter reading of the intermediate meter on the KNX (after a change or cyclically). The meter reading can be read out via the KNX if the R-flag is set. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -2147483648...2147483647 here).				

Function	Name	Type	DPT	Flag
Intermediate counter start value	I ... - Input	1-byte	5,010	C, -, W, -, U
If the intermediate counter is working as an up-counter, the input receives the start value of the intermediate counter via this communication object. This object is visible if the "Start value specification" parameter is set to "Via communication object". As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...255 here).				

Function	Name	Type	DPT	Flag
Intermediate counter start value	I ... - Input	1-byte	6,010	C, -, W, -, U
If the intermediate counter is working as an up-counter, the input receives the start value of the intermediate counter via this communication object. This object is visible if the "Start value specification" parameter is set to "Via communication object". As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -128...127 here).				

Function	Name	Type	DPT	Flag
Intermediate counter start value	I ... - Input	2-byte	7,001	C, -, W, -, U

If the intermediate counter is working as an up-counter, the input receives the start value of the intermediate counter via this communication object. This object is visible if the "Start value specification" parameter is set to "Via communication object".

As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...65535 here).

Function	Name	Type	DPT	Flag
Intermediate counter start value	I ... - Input	2-byte	8,001	C, -, W, -, U

If the intermediate counter is working as an up-counter, the input receives the start value of the intermediate counter via this communication object. This object is visible if the "Start value specification" parameter is set to "Via communication object".

As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -32768...32767 here).

Function	Name	Type	DPT	Flag
Intermediate counter start value	I ... - Input	4-byte	12,001	C, -, W, -, U

If the intermediate counter is working as an up-counter, the input receives the start value of the intermediate counter via this communication object. This object is visible if the "Start value specification" parameter is set to "Via communication object".

As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...4294967295 here).

Function	Name	Type	DPT	Flag
Intermediate counter start value	I ... - Input	4-byte	13,001	C, -, W, -, U

If the intermediate counter is working as an up-counter, the input receives the start value of the intermediate counter via this communication object. This object is visible if the "Start value specification" parameter is set to "Via communication object".

As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -2147483648...2147483647 here).

Function	Name	Type	DPT	Flag
Intermediate counter end value	I ... - Input	1-byte	5,010	C, -, W, -, U
If the intermediate counter is working as an up-counter, the input receives the end value of the intermediate counter via this communication object. This object is visible when parameter "End value specification" is set to "Via communication object". As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...255 here).				

Function	Name	Type	DPT	Flag
Intermediate counter end value	I ... - Input	1-byte	6,010	C, -, W, -, U
If the intermediate counter is working as an up-counter, the input receives the end value of the intermediate counter via this communication object. This object is visible when parameter "End value specification" is set to "Via communication object". As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -128...127 here).				

Function	Name	Type	DPT	Flag
Intermediate counter end value	I ... - Input	2-byte	7,001	C, -, W, -, U
If the intermediate counter is working as an up-counter, the input receives the end value of the intermediate counter via this communication object. This object is visible when parameter "End value specification" is set to "Via communication object". As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...65535 here).				

Function	Name	Type	DPT	Flag
Intermediate counter end value	I ... - Input	2-byte	8,001	C, -, W, -, U
If the intermediate counter is working as an up-counter, the input receives the end value of the intermediate counter via this communication object. This object is visible when parameter "End value specification" is set to "Via communication object". As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -32768...32767 here).				

Function	Name	Type	DPT	Flag
Intermediate counter end value	I ... - Input	4-byte	12,001	C, -, W, -, U
If the intermediate counter is working as an up-counter, the input receives the end value of the intermediate counter via this communication object. This object is visible when parameter "End value specification" is set to "Via communication object". As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...4294967295 here).				

Function	Name	Type	DPT	Flag
Intermediate counter end value	I ... - Input	4-byte	13,001	C, -, W, -, U
If the intermediate counter is working as an up-counter, the input receives the end value of the intermediate counter via this communication object. This object is visible when parameter "End value specification" is set to "Via communication object". As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -2147483648...2147483647 here).				

Function	Name	Type	DPT	Flag
Intermediate counter end value	I ... - Input	1-byte	5,010	C, -, W, -, U
If the intermediate counter is working as a down-counter, the input receives the end value of the intermediate counter via this communication object. This object is visible when parameter "End value specification" is set to "Via communication object". As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...255 here).				

Function	Name	Type	DPT	Flag
Intermediate counter end value	I ... - Input	1-byte	6,010	C, -, W, -, U
If the intermediate counter is working as a down-counter, the input receives the end value of the intermediate counter via this communication object. This object is visible when parameter "End value specification" is set to "Via communication object". As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -128...127 here).				

Function	Name	Type	DPT	Flag
Intermediate counter end value	I ... - Input	2-byte	7,001	C, -, W, -, U
If the intermediate counter is working as a down-counter, the input receives the end value of the intermediate counter via this communication object. This object is visible when parameter "End value specification" is set to "Via communication object". As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...65535 here).				

Function	Name	Type	DPT	Flag
Intermediate counter end value	I ... - Input	2-byte	8,001	C, -, W, -, U
If the intermediate counter is working as a down-counter, the input receives the end value of the intermediate counter via this communication object. This object is visible when parameter "End value specification" is set to "Via communication object". As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -32768...32767 here).				

Function	Name	Type	DPT	Flag
Intermediate counter end value	I ... - Input	4-byte	12,001	C, -, W, -, U
If the intermediate counter is working as a down-counter, the input receives the end value of the intermediate counter via this communication object. This object is visible when parameter "End value specification" is set to "Via communication object". As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...4294967295 here).				

Function	Name	Type	DPT	Flag
Intermediate counter end value	I ... - Input	4-byte	13,001	C, -, W, -, U
If the intermediate counter is working as a down-counter, the input receives the end value of the intermediate counter via this communication object. This object is visible when parameter "End value specification" is set to "Via communication object". As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -2147483648...2147483647 here).				

Function	Name	Type	DPT	Flag
Intermediate counter start value	I ... - Input	1-byte	5,010	C, -, W, -, U
If the intermediate counter is working as a down-counter, the input receives the start value of the intermediate counter via this communication object. This object is visible if the "Start value specification" parameter is set to "Via communication object". As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...255 here).				

Function	Name	Type	DPT	Flag
Intermediate counter start value	I ... - Input	1-byte	6,010	C, -, W, -, U
If the intermediate counter is working as a down-counter, the input receives the start value of the intermediate counter via this communication object. This object is visible if the "Start value specification" parameter is set to "Via communication object". As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -128...127 here).				

Function	Name	Type	DPT	Flag
Intermediate counter start value	I ... - Input	2-byte	7,001	C, -, W, -, U
If the intermediate counter is working as a down-counter, the input receives the start value of the intermediate counter via this communication object. This object is visible if the "Start value specification" parameter is set to "Via communication object". As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...65535 here).				

Function	Name	Type	DPT	Flag
Intermediate counter start value	I ... - Input	2-byte	8,001	C, -, W, -, U
If the intermediate counter is working as a down-counter, the input receives the start value of the intermediate counter via this communication object. This object is visible if the "Start value specification" parameter is set to "Via communication object". As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -32768...32767 here).				

Function	Name	Type	DPT	Flag
Intermediate counter start value	I ... - Input	4-byte	12,001	C, -, W, -, U
If the intermediate counter is working as a down-counter, the input receives the start value of the intermediate counter via this communication object. This object is visible if the "Start value specification" parameter is set to "Via communication object". As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter 0...4294967295 here).				

Function	Name	Type	DPT	Flag
Intermediate counter start value	I ... - Input	4-byte	13,001	C, -, W, -, U
If the intermediate counter is working as a down-counter, the input receives the start value of the intermediate counter via this communication object. This object is visible if the "Start value specification" parameter is set to "Via communication object". As long as no correct value telegram is received, the input transmits an interval limit fault. The data format and data point type are set according to the configured "data point type | value range" of the pulse meter (pulse meter -2147483648...2147483647 here).				

Function	Name	Type	DPT	Flag
Intermediate counter disable reset function	I ... - Input	1-bit	1,003	C, -, W, -, U
Reset of the current intermediate counter status can be disabled via this object. If the "Reset meter by disabling object" parameter is set to "active", the meter reset function can be disabled by this object even if it is enabled in the parameters. During the time it is disabled, the meter cannot be reset. The polarity of the object is defined by the "Object polarity" parameter in the process.				

13.8 Output

The "Output" channel function can be parametrised for the first four extension inputs. An LED or an electronic relay can be connected to the output and actuated via the bus. The object polarity can be configured.

When the LED is connected, the channel can realise various applications in combination with the logic functions.

13.8.1 Applications

This chapter describes a selection of implementable application cases of the "output" channel function.

The cases are implemented in combination with the available logic functions. The logic functions are enabled on the "General" parameter page and parameterised on separate parameter pages. The output is connected via group addresses by the communication objects with the logic functions.

i Any evaluation of a forced position object can be performed directly by means of the status of the actuator and visualised by means of the output of the push-button interface.

13.8.1.1 Flashing

The "flashing" application case can visualise an alarm with the LED connected to the output.

As soon as the device receives a 1-bit KNX telegram for the initiation of an alarm by means of the communication object "Logic gate (Inverter) - Input 1", an LED connected to the channel LED can flash in the "output" channel function.

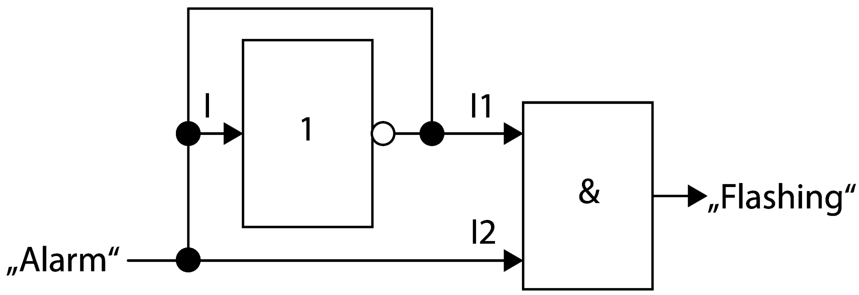


Figure 30: "Flashing" diagram

Example: parameterisation for "flashing" application case
Number of logic functions = 2
Channel function = output Object polarity = 1 = ON / 0 = OFF
Type of logic function *n* = logic gate Selection: Logic gate = Invert (NOT)

Example: parameterisation for "flashing" application case
Transmission criterion = always transmit when the inputs are updated Delay for transmission of the result = 1 s
Type of logic function *m* = logic gate Selection: Logic gate = AND Input 1 = input object, Invert input = inactive Input 2 = input object, Invert input = inactive Input 3 = deactivated Input 4 = deactivated Transmission criterion = transmit only if the output changes Delay for transmission of the result = 0 s

For the implementation of the "flashing" application case, six communication objects are to be connected via three group addresses as illustrated in the "Flashing" diagram in the parameterisation example.

Example: connecting objects for "flashing" application case
Group address 1 Logic *n* - Input / logic gate (inverter) input 1 Logic *m* - Input / logic gate (AND) input 2
Group address 2 Logic *n* - Input / logic gate (inverter) input 1 Logic *m* - Input / logic gate (AND) input 1 Logic *n* - Output / Logic gate output
Group address 3 K *n* - Input / output - Switching Logic *m* - Output / Logic gate output

13.8.1.2 Timing functions

The "time functions" application case can be used to switch on the LED connected to the output after a delay, switch it off after a delay or switch it on and off after a delay.

<u>Time-delayed switch-on</u>

As soon as the device receives a 1-bit KNX telegram for the initiation of the delayed switch-on process by means of the "Disabling element input" communication object, an LED connected to the channel can flash after a delay in the "output" channel function.

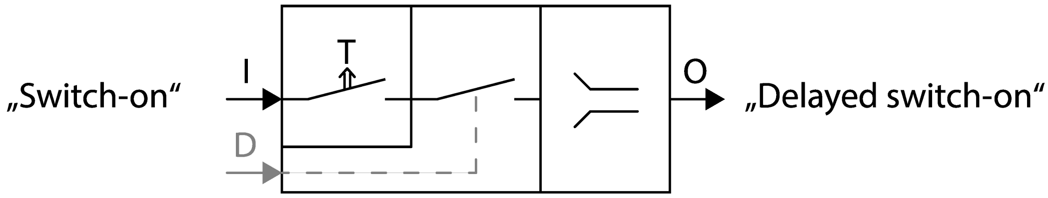


Figure 31: "Delayed switch-on" diagram

Example: parameterisation for "delayed switch-on" application case
Number of logic functions = 1
Channel function = output Object polarity = 1 = ON / 0 = OFF
Type of logic function *n* = disabling element (filtering/time) Time function = delay only ON telegrams Delay for ON telegrams = 10 s Disabling object polarity = 0 = enabled / 1 = disabled Filter function = ON -> ON / OFF -> OFF Transmission criterion = always transmit when the input is updated

For the implementation of the "delayed switch-on" application case, three communication objects are to be connected via two group addresses as illustrated in the "Delayed switch-on" diagram in the parameterisation example.

The communication object "Logic *n* - Input / Disabling element Disabling function" is not used in this application case.

Example: connecting objects for "delayed switch-on" application case
Group address 1 Logic *n* - Input / Disabling element input
Group address 2 K *n* - Input / output - Switching Logic *n* - Output / Disabling element output

i KNX telegrams used to switch off the output are processed without delay.

Time-delayed switch-off

As soon as the device receives a 1-bit KNX telegram for the initiation of the delayed switch-off process by means of the "Disabling element input" communication object, an LED connected to the channel can be switched off after a delay in the "output" channel function.

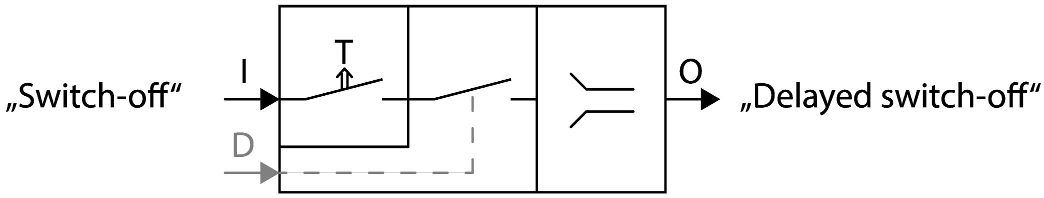


Figure 32: "Delayed switch-off" diagram

Example: parameterisation for "delayed switch-off" application case
Number of logic functions = 1
Channel function = output Object polarity = 1 = ON / 0 = OFF
Type of logic function *n* = disabling element (filtering/time) Time function = delay only OFF telegrams Delay for OFF telegrams = 10 s Disabling object polarity = 0 = enabled / 1 = disabled Filter function = ON -> ON / OFF -> OFF Transmission criterion = always transmit when the input is updated

For the implementation of the "delayed switch-off" application case, three communication objects are to be connected via two group addresses as illustrated in the "Delayed switch-off" diagram in the parameterisation example.

The communication object "Logic *n* - Input / Disabling element Disabling function" is not used in this application case.

Example: connecting objects for "delayed switch-off" application case
Group address 1 Logic *n* - Input / Disabling element input
Group address 2 K *n* - Input / output - Switching Logic *n* - Output / Disabling element output

i KNX telegrams used to switch on the output are processed without delay.

Time-delayed switching on and off

As soon as the device receives 1-bit KNX telegrams for the initiation of the delayed switch-off process by means of the "Disabling element input" communication object, an LED connected to the channel can be switched on and off after a delay in the "output" channel function.

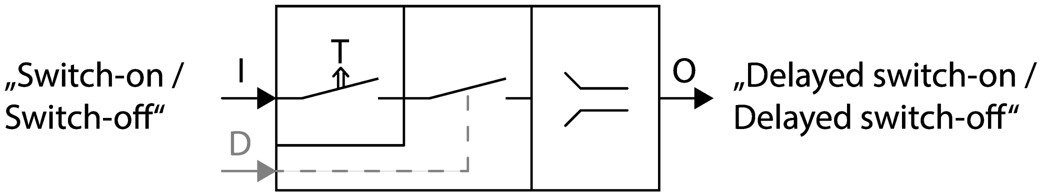


Figure 33: "Delayed switch-on and switch-off" diagram

Example: parameterisation for "delayed switch-on and switch-off" application case
Number of logic functions = 1
Channel function = output Object polarity = 1 = ON / 0 = OFF
Type of logic function *n* = disabling element (filtering/time) Time function = delay ON and OFF telegrams Delay for ON telegrams = 5 s Delay for OFF telegrams = 10 s Disabling object polarity = 0 = enabled / 1 = disabled Filter function = ON -> ON / OFF -> OFF Transmission criterion = always transmit when the input is updated

For the implementation of the "delayed switch-on and switch-off" application case, three communication objects are to be connected via two group addresses as illustrated in the "Delayed switch-on and switch-off" diagram in the parameterisation example.

The communication object "Logic *n* - Input / Disabling element Disabling function" is not used in this application case.

Example: connecting objects for "delayed switch-on and switch-off" application case
Group address 1 Logic *n* - Input / Disabling element input
Group address 2 K *n* - Input / output - Switching Logic *n* - Output / Disabling element output

Staircase function (time-delayed switch-off, triggerable)

As soon as the device receives a 1-bit KNX telegram for the initiation of the delayed switch-off process by means of the "Disabling element input" communication object, an LED connected to the channel can be switched off after a delay in the "output" channel function. The LED is switched off after a delay again if there are new KNX telegrams.

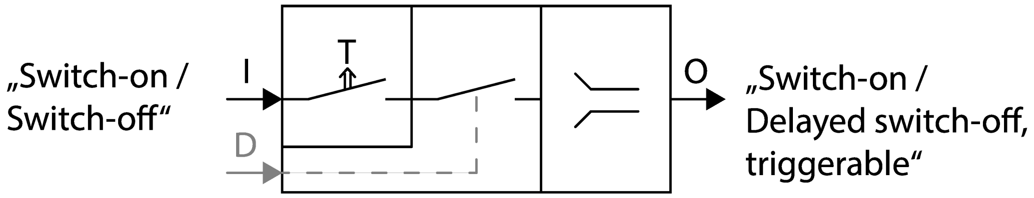


Figure 34: "Staircase function" diagram

Example: parameterisation for "staircase function" application case
Number of logic functions = 1
Channel function = output Object polarity = 1 = ON / 0 = OFF
Type of logic function *n* = disabling element (filtering/time) Time function = delay only OFF telegrams Delay for OFF telegrams = 1 min Disabling object polarity = 0 = enabled / 1 = disabled Filter function = ON -> ON / OFF -> OFF Transmission criterion = transmit only if the output changes

For the implementation of the "staircase function" application case, three communication objects are to be connected via two group addresses as illustrated in the "staircase function" diagram in the parameterisation example.

The communication object "Logic *n* - Input / Disabling element Disabling function" is not used in this application case.

Example: connecting objects for "staircase function" application case
Group address 1 Logic *n* - Input / Disabling element input
Group address 2 K *n* - Input / output - Switching Logic *n* - Output / Disabling element output

i KNX telegrams used to switch on the output are processed without delay.

13.8.1.3 Disabling function

The output can be disabled in the "disabling function" application case.

A channel at the "output" channel function can be disabled as soon as the device receives a 1-bit KNX telegram for the initiation of the disabling by means of the communication object "Disabling element Disabling function".

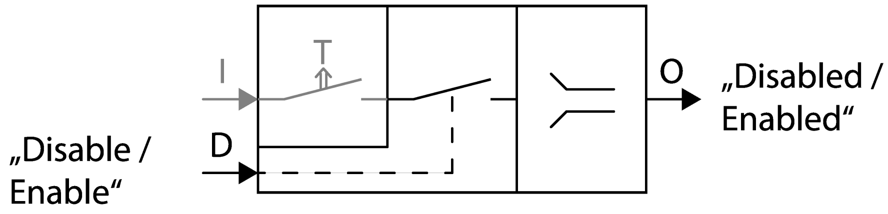


Figure 35: "Disabling function" diagram

Example: parameterisation for "disabling function" application case
Number of logic functions = 1
Channel function = output Object polarity = 1 = ON / 0 = OFF
Type of logic function *n* = disabling element (filtering/time) Time function = no delay Filter function = ON -> ON / OFF -> OFF Transmission criterion = always transmit when the input is updated

For the implementation of the "disabling function" application case, four communication objects are to be connected via three group addresses as illustrated in the "Disabling function" diagram in the parameterisation example.

Example: connecting objects for "disabling function" application case
Group address 1 Logic *n* - Input / Disabling element input
Group address 2 K *n* - Input / output - Switching Logic *n* - Output / Disabling element output
Group address 3 Logik *n* - Input / Disabling element Disabling function

13.8.1.4 Status indication reference value

In the "status indication reference value" application case, the LED connected to the output can light up depending on the value received. Different value telegrams can be received.

As soon as the device receives a value telegram for the initiation of the comparison-based switch-on and switch-off processes by means of the "comparator input" communication object, an LED connected to the channel can be switched on and off in the "output" channel function.

Example: parameterisation for "status indication references value" application case
Number of logic functions = 1
Channel function = output

Example: parameterisation for "status indication references value" application case
Object polarity = 1 = ON / 0 = OFF
Type of logic function *n* = comparator Data format = 1-byte value 0...255 (DPT 5.010) Reference function = greater than or equal (E ≥ V) Reference value (R) = 150 Transmission criterion = transmit only if the output changes

For the implementation of the "status indication reference value" application case, three communication objects are to be connected via two group addresses as illustrated in the "Status indication reference value" diagram in the parameterisation example.

Example: connecting objects for "status indication references value" application case
Group address 1 Logic *n* - Input / Comparator input
Group address 2 K *n* - Input / output - Switching Logic *n* - Output / Comparator output

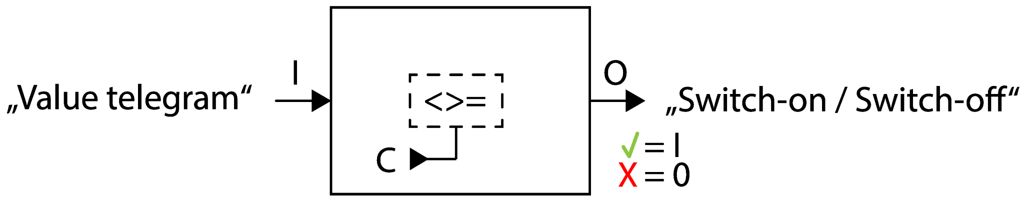


Figure 36: "Status indication reference value" diagram

KNX telegrams used to switch off the output are processed without delay.

13.8.2 Table of parameters

The following parameter is available in the "output" channel function.

Object polarity	1 = ON / 0 = OFF 0 = ON / 1 = OFF
This parameter defines the value of the output object at which the channels is actuated.	

13.8.3 Object list

The following communication objects are available in the "output" channel function. The name can be adjusted with the "Name" parameter.

Function	Name	Type	DPT	Flag
Switch Output	I ... - Input	1-bit	1,001	C, -, W, -, U
1-bit object for receiving switching telegrams (ON, OFF). The output channel is actuated according to the parameterisation.				

14 Heartbeat function

The heartbeat function makes it easy to check whether the application is running error-free in a device. For this purpose, the communication object Heartbeat sends a corresponding heartbeat telegram with a settable cycle time. The heartbeat function is enabled on the "General" parameter page.

14.1 Parameters for heartbeat

General - Enabled functions

Heartbeat function	Checkbox (yes / **no**)
If the parameter is activated, the heartbeat functions and thus the "Heartbeat" object are enabled.	

General -> Heartbeat

Cycle time for transmission of device status	**0** ... 23 h 0 ... **2** ... 59 min
This parameter defines the time with which the device sends a telegram with the value "1" when the application is running. To limit the bus load, times shorter than 1 minute are excluded.	

14.2 Object list for heartbeat

Function	Name	Type	DPT	Flag
Heartbeat	Device - Output	1-bit	1,002	C, R, -, T, A
1-bit object for cyclical signalling of the device function. When the application of the device is running, the communication object transmits the value "1" at the set cycle time.				

15 Logic functions

The device has a very flexible way of using logic functions.

The logic functions have the following options:

– Up to eight logic functions can be activated.
– Logic gates (e. g. AND, OR, exclusive OR, each with up to 4 inputs) can be set up and thus switching and status information can be linked and evaluated.
– A one-bit to one-byte converter and a disabling element with filter and time functions can be configured for each logic function.
– Comparators or limit value switches with hysteresis can be set as a logic function.
– The logic functions have their own KNX communication objects and can process telegrams of the actuator or of other bus devices.

Selecting logic functions and configuring their number

To be able to use logic functions, they must be selected on the "General" parameter page.

■ The "Logic functions" parameter can be used to select whether the logic functions should be used. If one of the logic functions is selected, the number of logic functions must also be selected.

  The "Logic functions" parameter node, which contains additional parameter pages, becomes available if "logic functions" is activated. The configuration of the logic functions takes place in this parameter node.

  Configure the "Number of logic functions" parameter to the desired value; up to eight logic functions are available.

Logic functions can be enabled in steps so that the number of visible functions and, in consequence, the available parameters and communication objects are visible in the ETS.

i The application program deletes existing logic functions from the configuration if the number of available functions is reduced.

The device contains up to eight simple logic functions. Simple logical operations in a KNX installation can be performed using these functions. Linking of input and output objects allows the networking of logic functions, permitting the execution of complex operations.

15.1 Logic functions parameters

General

<table>
<tr><td>Logic functions</td><td>activated
deactivated</td></tr>
<tr><td colspan="2">This parameter activates the logic functions. Additional parameters and objects become visible.
The "Logic functions" parameter node, which contains additional parameter pages, will become available if the logic function is activated. The configuration of the logic functions takes place in this parameter node.</td></tr>
</table>

<table>
<tr><td>Number of logic functions (1...8)</td><td>1...8</td></tr>
<tr><td colspan="2">The number of required logic functions is defined here.</td></tr>
</table>

Logic functions -> Logic function...

<table>
<tr><td>Name of logic function</td><td>Free text</td></tr>
<tr><td colspan="2">The text entered in this parameter is applied to the name of the communication objects and is used to label the logic function in the ETS parameter window (e. g. "limit value switch outside temperature", disabling of venetian blind garden door).
The text is not programmed in the device.</td></tr>
</table>

Type of logic function	**Logic gate** Converter (1-bit -> 1-byte) Disabling element (filtering/time) Comparator Limit value switch with hysteresis

It is possible to be define which logical operation is to be executed for each logic function. This parameter is visible only if the simple logic functions have been set on the "General" parameter page.

Logic gate: The logic function works as a Boolean logic gate with optionally 1 ... 4 inputs and one output.

Converter (1-bit -> 1-byte): The logic function is configured as a converter. The converter has a 1-bit input and a 1-byte output and also a disabling object. ON / OFF telegrams can be converted to preconfigured values. The disabling object is able to deactivate the converter.

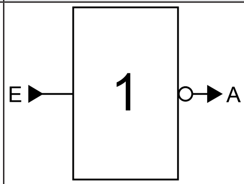
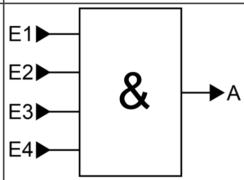
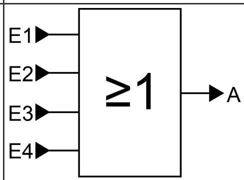
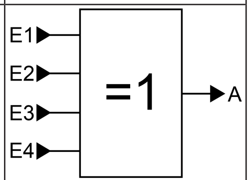
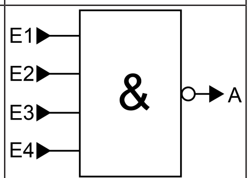
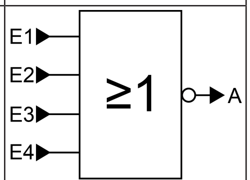
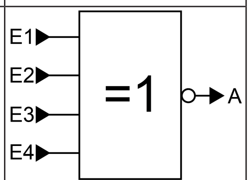
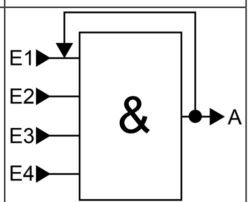
Disabling element (Filtering/Time): The logic function is configured as a disabling element. The disabling element has a 1-bit input and a 1-bit output. This logic function can delay input signals depending on the state (ON or OFF) and output them filtered at the output. A disabling object is also available, which can be used to deactivate the disabling element.

Comparator: The logic function works as a comparator with an input whose data format can be parameterised, and with a 1-bit output to output the result of the comparison operation. The reference function and the reference value are configured in the ETS.

Limit value switch with hysteresis: The logic function acts like a limit switch with hysteresis. An input with a configurable data format and a 1-bit output are available. The hysteresis is determined by an upper and lower threshold. The threshold values can be parameterised in the ETS. The input value is compared with the threshold values. The command at the output (ON / OFF) upon exceeding or falling below the configured threshold values can be configured.

15.2 Logic gate

A logic gate has up to 4 Boolean inputs (1-bit) and one logic output (1-bit). In consequence, a logic operation only supports the 1-bit data format. The following table shows configurable comparison operations Logic gate and explains their function.

Logic gate	Description	Icon
Invert (NOT)	The logic gate has only one input. The input is forwarded to the gate output inverted.	
AND (AND)	Logic gate has 4 inputs. The output is "1" if all inputs are "1". Otherwise the output is "0".	
OR (OR)	Logic gate has 4 inputs. The output is "0" if all inputs are "0". Otherwise the output is "1".	
Exclusive OR (XOR)	Logic gate has 4 inputs. The output is "1" if only one input is "1". Otherwise the output is "0".	
Inverted And (NAND)	Logic gate has 4 inputs. The output is "0" if all inputs are "1". Otherwise the output is "1".	
Inverted Or (NOR)	Logic gate has 4 inputs. The output is "1" if all inputs are "0". Otherwise the output is "0".	
Inverted Exclusive OR (NXOR)	Logic gate has 4 inputs. The output is "0" if only one input is "1". Otherwise the output is "1".	
AND with feedback (ANDR)	Logic gate has 4 inputs. The output is fed back to the first input of the gate. The output is "1" if all inputs are "1". Otherwise the output is "0". If input 1 is set to "1" and the output is still "0", the feedback of input 1 is also reset to "0". Only when	

Logic gate	Description	Icon
	inputs 2 ... 4 are "1" will a newly received "1" at input 1 cause the output to assume the logical state "1". Application: Switch light manually only at twilight -> Switch on input 1, twilight sensor on input 2 -> The manual switching signal is ignored for as long as the twilight sensor has not issued an enabling signal. The manual switching sign is only executed at twilight.	

Inputs of a logic gate can be activated or deactivated separately. This allows gates with an individual number of inputs (1 ... 4) to be implemented. As an option, it is possible to invert inputs.

The transmission behaviour of the gate output can be configured.

15.2.1 Logic gate parameters

Logic functions -> Logic function...

Selection logic gate	Invert (NOT) **AND (AND)** OR (OR) Exclusive OR (XOR) Inverted And (NAND) Inverted Or (NOR) Inverted Exclusive OR (NXOR) AND with feedback (ANDR)

This parameter defines the function of the logic gate and is only visible if "Type of logic function = logic gate".

Invert (NOT): The inverter is configured. The gate has one input and one output. The Boolean data value of the input is forwarded to the output inverted.

And (AND): An AND gate is configured. The gate has 1...4 inputs and one output. The inputs are logically AND-linked. The result is forwarded to the output.

OR (OR): An OR gate is configured. The gate has 1...4 inputs and one output. The inputs are logically OR-linked. The result is forwarded to the output.

Exclusive-OR (XOR): An exclusive-OR gate is configured. The gate has 1...4 inputs and one output. The inputs are logically Exclusive-OR-linked. The result is forwarded to the output.

Inverted AND (NAND): An inverted AND gate is configured. The gate has 1...4 inputs and one output. The inputs are logically AND-linked. The result is forwarded to the output inverted.

Inverted OR (NOR): An OR gate is configured. The gate has 1...4 inputs and one output. The inputs are logically OR-linked. The result is forwarded to the output inverted.

Inverted Exclusive OR (NXOR): An inverted Exclusive OR gate is configured. The gate has 1...4 inputs and one output. The inputs are logically Exclusive-OR-linked. The result is forwarded to the output inverted.

AND with feedback (ANDR): An AND gate with feedback is configured. The gate has 1...4 inputs and one output. The output is fed back to the first input of the gate.

Input 1	deactivated **Input object**

Inputs of a logic gate can be activated or deactivated separately. This allows gates with an individual number of inputs (1 ... 4) to be implemented. This parameter defines whether the first input of the gate should be used.

This parameter is only visible if "Type of logic function = logic gate".

Input 2	deactivated **Input object**
Inputs of a logic gate can be activated or deactivated separately. This allows gates with an individual number of inputs (1 ... 4) to be implemented. This parameter defines whether the second input of the gate should be used. This parameter is only visible if "Type of logic function = logic gate".	

Input 3	**deactivated** Input object
Inputs of a logic gate can be activated or deactivated separately. This allows gates with an individual number of inputs (1 ... 4) to be implemented. This parameter defines whether the third input of the gate should be used. This parameter is only visible if "Type of logic function = logic gate".	

Input 4	**deactivated** Input object
Inputs of a logic gate can be activated or deactivated separately. This allows gates with an individual number of inputs (1 ... 4) to be implemented. This parameter defines whether the fourth input of the gate should be used. This parameter is only visible if "Type of logic function = logic gate".	

Invert input	Checkbox (yes/**no**)
It is possible to invert inputs of the logic gate as an option. This parameter is available for each input of the gate and defines whether the respective input should be evaluated unchanged or inverted. This parameter is only visible if "Type of logic function = logic gate".	

Transmission criteria	**Always transmit when the inputs are updated** Transmit only if the output changes Transmit cyclically
The transmission behaviour of the output can be configured here. Always transmit when the input is updated: The output transmits the current object value to the KNX with every telegram that is received at the input. Transmit only if the output changes: The output only transmits the current object value if the object value has changed compared to the last transmission process. The output always transmits during the first telegram to an input after the bus voltages return or after an ETS programming operation. Transmit cyclically: With this setting, the output transmits the current object value to the KNX cyclically. After the bus voltage returns or after an ETS programming operation, the cyclical transmission is not started until the first telegram has been received at the input. The output also transmits as soon as a new telegram is received at the input. At the same time, the cycle time for cyclical transmission is restarted!	

<table>
<tr><td>Delay for transmission of the result</td><td>0...99 h
0...59 min
0…59 s</td></tr>
<tr><td colspan="2">An optional delay before result transmission (telegram at output) can be configured.
With the setting "always transmit when the input is updated": Telegrams at the output are only transmitted after the trigger when the delay has elapsed. The delay time is restarted by each telegram at the input.
With the setting "only transmit if the output changes": Telegrams are only sent when the object value changes at the output if the delay has expired. If the logic function is reprocessed by a new telegram at the input within the delay time and the object value changes again, then the delay restarts. If the object value of the output does not change due to new input telegrams, the delay does not restart.</td></tr>
</table>

<table>
<tr><td>Cycle time</td><td>0...99 h
0 … 5 ...59 min
0…59 s</td></tr>
<tr><td colspan="2">During cyclical transmission of the output, this parameter defines the cycle time.
If the cycle time is parameterised with "0h, 0min, 0s", no cyclical transmission takes place.</td></tr>
</table>

15.2.2 Object list for logic gate

Function	Name	Type	DPT	Flag
Logic gate (…) Input 1	Logic .. - Input	1-bit	1,002	C, -, W, -, U
1-bit object as input 1 of a logic gate (1...8). The input status can be inverted optionally. This object is only available if the type of logic function is configured to "logic gate" and input 1 is used.				

Function	Name	Type	DPT	Flag
Logic gate (…). Input 2	Logic .. - Input	1-bit	1,002	C, -, W, -, U
1-bit object as input 2 of a logic gate (1...8). The input status can be inverted optionally. This object is only available if the type of logic function is configured to "logic gate" and input 2 is used.				

Function	Name	Type	DPT	Flag
Logic gate (…) Input 3	Logic .. - Input	1-bit	1,002	C, -, W, -, U
1-bit object as input 3 of a logic gate (1...8). The input status can be inverted optionally. This object is only available if the type of logic function is configured to "logic gate" and input 3 is used.				

Function	Name	Type	DPT	Flag
Logic gate (…) Input 4	Logic .. - Input	1-bit	1,002	C, -, W, -, U
1-bit object as input 4 of a logic gate (1...8). The input status can be inverted optionally. This object is only available if the type of logic function is configured to "logic gate" and input 4 is used.				

Function	Name	Type	DPT	Flag
Logic gate output	Logic... - Output	1-bit	1,002	C, R, -, T, A
1-bit object as output of a logic gate (1...8). This object is only available if the type of logic function is configured to "logic gate".				

15.3 Converter (1-bit -> 1-byte)

The converter has a 1-bit input and a 1-byte output and also a disabling object. ON / OFF telegrams can be converted to preconfigured values. The disabling object is able to deactivate the converter.

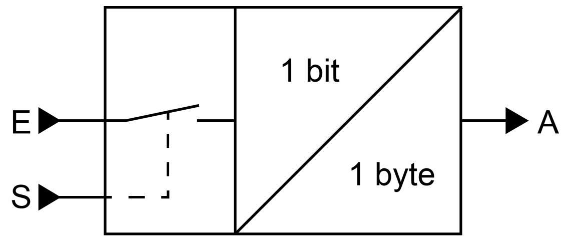


Figure 37: Converter (1-bit -> 1-byte)

The converter can react differently to input states. The parameter "Reaction at input to" defines whether the converter responds to ON and OFF commands or alternatively only processes ON or OFF telegrams.
A concrete 1-byte output value can be assigned to each 1-bit input status. The two output values can be configured anywhere in the range 0 ... 255 as required. The data format of the converter output object is set to DPT 5.001 (0...100%).

The disabling object can be deactivated via the converter. A deactivated converter no longer processes input states and consequently does not convert any new output values (the last value is retained and transmitted cyclically, if necessary). At the end of a disabling function, the converter is enabled again. The converter then waits for the next telegram at the input.
The telegram polarity of the disabling object can be configured.

The transmission behaviour of the converter output can be configured.

15.3.1 Converter parameters

Logic functions -> Logic function...

Reaction at input to	**ON and OFF telegrams** ON telegrams OFF telegrams
The converter can react differently to input states. It is defined here whether the converter responds to ON and OFF commands or alternatively only processes ON or OFF telegrams.	

Polarity of the locking object	**0 = enabled / 1 = disabled** 0 =disabled/ 1 = enabled
This parameter defines the polarity of the disabling object.	

Output value for ON (0...255)	0...**255**
A concrete 1-byte output value can be assigned to each 1-bit input status. This parameter defines the output value for ON telegrams. This parameter is only visible when the input should react to ON telegrams.	

Output value for OFF (0...255)	**0**...255
A concrete 1-byte output value can be assigned to each 1-bit input status. This parameter defines the output value for OFF telegrams. This parameter is only visible when the input should react to OFF telegrams.	

Transmission criteria	**Always transmit when the input is updated** Transmit only if the output changes Transmit cyclically
The transmission behaviour of the output can be configured here. Always transmit when the input is updated: The output transmits the current object value to the KNX with every telegram that is received at the input. Transmit only if the output changes: The output only transmits the current object value if the object value has changed compared to the last transmission process. The output always transmits during the first telegram to an input after the bus voltages return or after an ETS programming operation. Transmit cyclically: With this setting, the output transmits the current object value to the KNX cyclically. After the bus voltage returns or after an ETS programming operation, the cyclical transmission is not started until the first telegram has been received at the input. The output also transmits as soon as a new telegram is received at the input. At the same time, the cycle time for cyclical transmission is restarted!	

Transmission delay for sending the hours result (0...99)	**0**...99
An optional delay before result transmission (telegram at output) can be configured. With the setting "always transmit when the input is updated": Telegrams at the output are only transmitted after the trigger when the delay has elapsed. The delay time is restarted by each telegram at the input. With the setting "only transmit if the output changes": Telegrams are only sent when the object value changes at the output if the delay has expired. If the logic function is reprocessed by a new telegram at the input within the delay time and the object value changes again, then the delay restarts. If the object value of the output does not change due to new input telegrams, the delay does not restart. This parameter defines the hours of the delay time.	

Minutes (0...59)	**0**...59
This parameter defines the minutes of the delay time.	

Seconds (0...59)	**0**...59
This parameter defines the seconds of the delay time. The parameters for the transmission delay are only visible for "Transmission criteria" = "Always transmit when the input is updated" and "Only transmit when the output changes".	

Cycle time hours (0...99)	**0**...99
During cyclical transmission of the output, this parameter defines the cycle time. Setting the cycle time hours.	

Minutes (0...59)	0...**5**...59
This parameter defines the minutes of the cycle time.	

Seconds (0...59)	**0**...59
This parameter defines the seconds of the cycle time. The parameters for the cycle time are only visible if "transmission criteria" = "transmit cyclically".	

15.3.2 Object list for converter

<table>
<tr><th>Function</th><th>Name</th><th>Type</th><th>DPT</th><th>Flag</th></tr>
<tr><td>Converter Input</td><td>Logic ... - Input</td><td>1-bit</td><td>1,002</td><td>C, -, W, -, U</td></tr>
<tr><td colspan="5">1-bit object as input of a converter. It is possible to configure whether the converter responds to ON and OFF commands or alternatively processes only ON or only OFF telegrams.
This object is only available if the type of logic function is configured to "converter".</td></tr>
</table>

<table>
<tr><th>Function</th><th>Name</th><th>Type</th><th>DPT</th><th>Flag</th></tr>
<tr><td>Converter
Disabling function</td><td>Logic ... - Input</td><td>1-bit</td><td>1,002</td><td>C, -, W, -, U</td></tr>
<tr><td colspan="5">1-bit object as disabling input of a converter. A disabled converter no longer processes input states and consequently does not convert any new output values (the last value is retained and transmitted cyclically, if necessary).
The telegram polarity can be configured.
This object is only available if the type of logic function is configured to "converter".</td></tr>
</table>

<table>
<tr><th>Function</th><th>Name</th><th>Type</th><th>DPT</th><th>Flag</th></tr>
<tr><td>Converter Output</td><td>Logic ... - Output</td><td>1-byte</td><td>5,001</td><td>C, R, -, T, A</td></tr>
<tr><td colspan="5">1-byte object as value output of a converter.
This object is only available if the type of logic function is configured to "converter".</td></tr>
</table>

15.4 Disabling element (filtering/time)

The disabling element has a 1-bit input and a 1-bit output as well as a disabling object. Input states (ON/OFF) can be delayed independently of one another and filtered at the output before output. The filter makes it possible to invert the states of the output (e. g. ON -> OFF) or to suppress it completely
(e. g. OFF -> ---, OFF is not transmitted). If the filter is not used, the disabling element only works with the time functions if required. Alternatively, it is possible to use only the filter (without delays).
The disabling object is able to deactivate the disabling element.

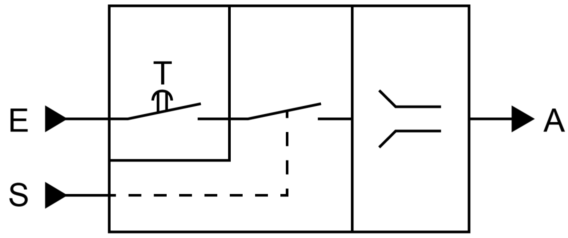


Figure 38: Disabling element (filtering/time)

The parameter "Time function" defines whether ON or OFF telegrams or both states are evaluated with a delay after reception at the input. If a delay is provided, the delay time can be configured separately for ON and OFF telegrams. A delay is only effective if the delay time is set to greater than "0". Each telegram received at the input re-triggers the receptive delay time.
If no delay is configured, the input telegrams go directly into the filter.

i Special feature when using the delays: If no telegram is received at the input, a configured delay time (time > 0) acts like an automatic cyclic trigger of the filter. The most recently received input status is then forwarded to the filter automatically and repeatedly after the delay has elapsed. This then works according to its configuration and forwards the result to the output of the disabling element. Consequently, the output then also transmits telegrams depending on the transmission criteria set. If the cyclical transmission of the output is not desired due to the automatic triggering of the filter, the transmission criterion should be set to "only transmit if the output changes".
If no delay is provided, the filter is only triggered automatically via the received telegrams and thus not automatically.

i After the bus voltage returns or after an ETS programming operation, the delays are triggered automatically.

The filter is set by the parameter "Filter function" according to the following table.

Filter function	Result
ON -> ON / OFF -> OFF	Input telegrams are forwarded to the output unchanged. Filter deactivated.
ON -> --- / OFF -> OFF	ON telegrams are filtered and not forwarded to the output. OFF telegrams are forwarded to the output unchanged.

Filter function	Result
ON -> ON / OFF -> ---	OFF telegrams are filtered and not forwarded to the output. ON telegrams are forwarded to the output unchanged.
ON -> OFF / OFF -> ON	ON telegrams are converted to OFF telegrams and OFF telegrams are converted to ON telegrams and are forwarded to the output.
ON -> --- / OFF -> ON	ON telegrams are filtered and not forwarded to the output. OFF telegrams are converted to ON telegrams and forwarded to the output.
ON -> OFF / OFF -> ---	OFF telegrams are filtered and not forwarded to the output. ON telegrams are converted to OFF telegrams and forwarded to the output.

The disabling element can be deactivated by the disabling object. A deactivated disabling element no longer forwards any input states to the filter and consequently does not convert any new output values (the last value is retained and transmitted cyclically, if necessary). However, the input states are still evaluated (even with effective delays). At the end of a disabling function, the disabling element is enabled again. The disabling element waits for the next telegram at the input or for the next cycle of the configured delay times.
The telegram polarity of the disabling object can be configured.

The transmission behaviour of the disabling element output can be configured.

15.4.1 Disabling element parameters

Logic functions -> Logic function...

Time function	**no delay** Delay only ON telegrams Delay only OFF telegrams Delay ON and OFF telegrams
This parameter defines whether ON or OFF telegrams or both states are evaluated with a delay after reception at the input. If a delay is provided, the delay time can be configured separately for ON and OFF telegrams. If no delay is configured, the input telegrams go directly into the filter.	

Delay for ON telegrams Minutes (0...59)	**0**...59
The delay for ON telegrams is configured here. A delay is only effective if the delay time is set to greater than "0". Each ON telegram received at the input re-triggers the delay time. Special feature when using the delays: If no telegram is received at the input, a configured delay time (time > 0) acts like an automatic cyclic trigger of the filter. The most recently received input status is then forwarded to the filter automatically and repeatedly after the delay has elapsed. This then works according to its configuration and forwards the result to the output of the disabling element. Consequently, the output then also transmits telegrams depending on the transmission criteria set. If the cyclical transmission of the output is not desired due to the automatic triggering of the filter, the transmission criterion should be set to "only transmit if the output changes". After the bus voltage returns or after an ETS programming operation, the delays are triggered automatically. Setting the ON delay time minutes.	

Seconds (0...59)	0...**10**...59
Setting the seconds of the ON delay time. The parameters for the ON delay are only available if the parameter "Time function" is set to "only delay ON telegrams" or "delay ON and OFF telegrams".	

Delay for OFF telegrams Minutes (0...59)	**0**...59
The delay for OFF telegrams is configured here. A delay is only effective if the delay time is set to greater than "0". Each OFF telegram received at the input re-triggers the delay time. Special feature when using the delays: If no telegram is received at the input, a configured delay time (time > 0) acts like an automatic cyclic trigger of the filter. The most recently received input status is then forwarded to the filter automatically and repeatedly after the delay has elapsed. This then works according to its configuration and forwards the result to the output of the disabling element. Consequently, the output then also transmits telegrams depending on the transmission criteria set. If the cyclical transmission of the output is not desired due to the automatic triggering of the filter, the transmission criterion should be set to "only transmit if the output changes". After the bus voltage returns or after an ETS programming operation, the delays are triggered automatically. Setting the OFF delay time minutes.	

Seconds (0...59)	0...**10**...59
Setting the OFF delay time seconds. The parameters for the OFF delay are only available if the parameter "Time function" is set to "only delay OFF telegrams" or "delay ON and OFF telegrams".	

Polarity of the locking object	**0 = enabled / 1 = disabled** 0 =disabled/ 1 = enabled
This parameter defines the polarity of the disabling object.	

Filter function	ON -> ON / OFF -> OFF ON -> --- / OFF -> OFF ON -> ON / OFF -> --- ON -> OFF / OFF -> ON ON -> --- / OFF -> ON ON -> OFF / OFF -> ---

This parameter defines the function of the filter.

ON -> ON / OFF -> OFF: Input telegrams are forwarded to the output unchanged. Filter deactivated.

ON -> --- / OFF -> OFF: ON telegrams are filtered and not forwarded to the output. OFF telegrams are forwarded to the output unchanged.

ON -> ON / OFF -> ---: OFF telegrams are filtered and not forwarded to the output. ON telegrams are forwarded to the output unchanged.

ON -> OFF / OFF -> ON: ON telegrams are converted to OFF telegrams and OFF telegrams are converted to ON telegrams and forwarded to the output.

ON -> --- / OFF -> ON: ON telegrams are filtered and not forwarded to the output. OFF telegrams are converted to ON telegrams and forwarded to the output.

ON -> OFF / OFF -> ---: OFF telegrams are filtered and not forwarded to the output. ON telegrams are converted to OFF telegrams and forwarded to the output.

Transmission criteria	**Always transmit when the input is updated** Transmit only if the output changes Transmit cyclically

The transmission behaviour of the output can be configured here.

Always transmit when the input is updated: The output transmits the current object value to the KNX with every telegram that is received at the input. In addition, transmission at the output is repeated if no telegram was received at the input when the delay times were used and the configured time has expired.

Transmit only if the output changes: The output only transmits the current object value if the object value has changed compared to the last transmission process. After the bus voltage returns or an ETS programming operation, the output always transmits.

Transmit cyclically: With this setting, the output transmits the current object value to the KNX cyclically. After the bus voltage returns or after an ETS programming operation, the cyclical transmission is not started until the first telegram has been received at the input. If the ON/OFF delay is used, the cyclical transmission starts automatically once the delay time has expired after the bus voltage returns or after an ETS programming operation. The output also transmits as soon as a new telegram is received at the input. At the same time, the cycle time for cyclical transmission is restarted!

Cycle time hours (0...99)	**0**...99
During cyclical transmission of the output, this parameter defines the cycle time. Setting the cycle time hours.	

Minutes (0...59)	0...**5**...59
This parameter defines the minutes of the cycle time.	

Seconds (0...59)	**0**...59
This parameter defines the seconds of the cycle time. The parameters for the cycle time are only visible if "transmission criteria" = "transmit cyclically".	

15.4.2 Object list for disabling element

Function	Name	Type	DPT	Flag
Disabling element Input	Logic .. - Input	1-bit	1,002	C, -, W, -, U
1-bit object as input of a disabling element. This object is only available if the type of logic function is configured to "disabling element".				

Function	Name	Type	DPT	Flag
Disabling element Disabling function	Logic .. - Input	1-bit	1,002	C, -, W, -, U
1-bit object as disabling input of a disabling element. A disabled disabling element no longer forwards any input states to the filter and consequently does not convert any new output values (the last value is retained and transmitted cyclically, if necessary). The telegram polarity can be configured. This object is only available if the type of logic function is configured to "disabling element".				

Function	Name	Type	DPT	Flag
Disabling element Output	Logic... - Output	1-bit	1,002	C, R, -, T, A
1-bit object as output of a disabling element. This object is only available if the type of logic function is configured to "disabling element".				

15.5 Comparator

The comparator works with an input whose data format can be parameterised, and with a 1-bit output to output the result of the comparison operation. The comparator compares the value received at the input with a configured reference value and evaluates whether the reference is correct (result = true) or not (result = false) according to the specified reference function.
The reference function and the reference value are configured in the ETS.

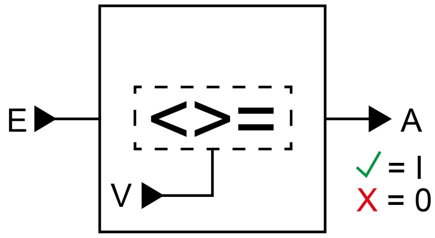


Figure 39: Comparator

The parameter "data format" defines the size and format of input object according to the following table. The output object is preset to 1-bit (DPT 1.002) and outputs the result of the comparison operation (ON = true / OFF = false). The reference value that can be set in the ETS adapts to the input data format.

Data format	KNX DPT
4-bit dimming	3,007
1-byte operating mode switchover	20,102
1-byte scene extension unit	18,001
1-byte value 0...255	5,010
1-byte brightness value 0...100%	5,001
2-byte value 0...655535	7,001
2-byte value -32768...32767	8,001
2-byte floating-point number	9.0xx
4-byte value -2147483648...2147483647	13,001

The following table shows the possible reference functions (I = input value, R = reference value).

Reference function	Function
Equal (I = R)	The comparator output is "ON" (true) if the input is equal to the reference value. Otherwise the output is "OFF" (false).
Not equal (I ≠ R)	The comparator output is "ON" (true) if the input is unequal to the reference value. If the input value is equal to the reference value, the output is "OFF" (false).
Greater than (I > R)	The comparator output is "ON" (true) if the input is greater than the reference value. If the input value is less than or equal to the reference value, the output will switch "OFF" (false).

Reference function	Function
Greater than or equal (I ≥ R)	The comparator output is "ON" (true) if the input is greater than the reference value or equal to the reference value. If the input value is smaller than the reference value, the output will switch "OFF" (false).
Smaller than (I < R)	The comparator output is "ON" (true) if the input is less than the reference value. If the input value is greater than or equal the reference value, the output will switch "OFF" (false).
Smaller than or equal (I ≤ R)	The comparator output is "ON" (true) if the input is less than the reference value or equal to the reference value. If the input value is greater than the reference value, the output will switch "OFF" (false).
Range testing less than (R1 < I < R2)	There are two reference values. The comparator output is "ON" (true) if the input is greater than the first reference value or less than the second reference value. If the input value is less than the first reference value or equal the first reference value or greater than the second reference value or equal the second reference value, the output will switch "OFF" (false).
Range testing less than or equal to (R1 ≤ I ≤ R2)	There are two reference values. The comparator output is "ON" (true) if the input is greater than or equal the first reference value and smaller than or equal the second reference value. If the input value is smaller than the first reference value or greater than the second reference value, the output will switch "OFF" (false).

The transmission behaviour of the comparator output can be configured.

15.5.1 Comparator parameters

Logic functions -> Logic function...

Data format	4-bit dimming (DPT 3.007) 1-byte operating mode switchover (DPT 20.102) 1-byte scene extension unit (DPT 18.001) **1-byte value 0...255 (DPT 5.010)** 1-byte brightness value 0...100% (DPT 5.001) 2-byte value 0...655,535 (DPT 7.001) 2-byte value -32,768...32,767 (DPT 8.001) 2-byte floating-point number (DPT 9.0xx) 4-byte value -2,147,483,648...2,147,483,647 (DPT 13.001)
This parameter defines the size and format of input object. The output object is preset to 1-bit (DPT 1.002) and outputs the result of the comparison operation (ON = true / OFF = false).	

Reference function	**Equal (I = R)** Not equal (I ≠ R) Greater than (I > R) Greater than or equal (I ≥ R) Smaller than (I < R) Smaller than or equal (I ≤ R) Range testing less than (R1 < I < R2) Range testing less than or equal to (R1 ≤ I ≤ R2)

The comparator compares the value received (I) at the input with a configured reference value (R) and evaluates whether the comparison is correct (result = true) or not (result = false) according to the specified reference function here.

Equal (I = R): The comparator output is "ON" (true) if the input is equal the reference value. Otherwise the output is "OFF" (false).

Not equal (I ≠ R): The comparator output is "ON" (true) if the input is unequal to the reference value. If the input value is equal to the reference value, the output is "OFF" (false).

Greater than (I > R): The comparator output is "ON" (true) if the input is greater than the reference value. If the input value is less than or equal to the reference value, the output will switch "OFF" (false).

Greater than or equal (I ≥ R): The comparator output is "ON" (true) if the input is greater than the reference value or equal to the reference value. If the input value is smaller than the reference value, the output will switch "OFF" (false).

Smaller than (I < R): The comparator output is "ON" (true) if the input is less than the reference value. If the input value is greater than or equal the reference value, the output will switch "OFF" (false).

Smaller than or equal (I ≤ R): The comparator output is "ON" (true) if the input is smaller than the reference value or equal to the reference value. If the input value is greater than the reference value, the output will switch "OFF" (false).

Range testing less than (R1 < I < R2): There are two reference values. The comparator output is "ON" (true) if the input is greater than the first reference value or less than the second reference value. If the input value is less than the first reference value or equal the first reference value or greater than the second reference value or equal the second reference value, the output will switch "OFF" (false).

Range testing less than or equal to (R1 ≤ I ≤ R2): There are two reference values. The comparator output is "ON" (true) if the input is greater than or equal the first reference value and smaller than or equal the second reference value. If the input value is smaller than the first reference value or greater than the second reference value, the output will switch "OFF" (false).

Reference value (R)	**Dimming darker, stop (0)** Dim darker, 100% (1) Dim darker, 50% (2) Dim darker, 25% (3) Dim darker, 12.5% (4) Dim darker, 6% (5) Dim darker, 3% (6) Dim darker, 1.5% (7) Increase brightness, stop (8) Increase brightness, 100% (9) Increase brightness, 50% (10) Increase brightness, 25% (11) Increase brightness, 12.5% (12) Increase brightness, 6% (13) Increase brightness, 3% (14) Increase brightness, 1.5% (15)
This parameter specifies the internal reference value (R) for the reference function. This parameter is available only if the "data format" is set to "4-bit dimming (DPT 3.007)".	

Reference value (R)	**Automatic mode (0)** Comfort mode (1) Standby mode (2) Night mode (3) Frost/heat protection (4)
This parameter specifies the internal reference value (R) for the reference function. This parameter is only available if the "data format" is set to "1-byte operating mode switchover (DPT 20.102)".	

Reference value (R)	**Recall scene 1 (0)** Recall scene 2 (1) ... Recall scene 64 (63) Save scene 1 (128) Save scene 2 (129) ... Save scene 64 (191)
This parameter specifies the internal reference value (R) for the reference function. This parameter will be available only if the "data format" is set to "1-byte scene extension unit (DPT 18.001)".	

Reference value (R) (0...255)	**0**...255
This parameter specifies the internal reference value (R) for the reference function. This parameter will be available only if the "data format" is set to "1-byte value -0...255 (DPT 5.010)".	

Reference value (R) (0...100%)	**0**...100
This parameter specifies the internal reference value (R) for the reference function. This parameter will be available only if the "data format" is set to "1-byte brightness value 0...100% (DPT 5.001)".	

Reference value (R) (0...65535)	**0**...65535
This parameter specifies the internal reference value (R) for the reference function. This parameter will be available only if the "data format" is set to "2-byte value 0...65535 (DPT 7.001)".	

Reference value (R) (-32768...32767)	-32768...**0**...32767
This parameter specifies the internal reference value (R) for the reference function. This parameter will be available only if the "data format" is set to "2-byte value -32768...32767 (DPT 8.001)".	

Reference value (R) (-671088...670760)	-671088...**0**...670760
This parameter specifies the internal reference value (R) for the reference function. This parameter is only available if the "data format" is set to "2-byte floating point value (DPT 9.0xx)".	

Reference value (R) (-2147483648...2147483647)	-2147483648...**0**...2147483647
This parameter specifies the internal reference value (R) for the reference function. This parameter will be available only if the "data format" is set to "4-byte value -2147483648...2147483647 (DPT 13.001)".	

i Two reference values (R1 & R2) can be configured if the range testing is configure as "reference function". In this case, the setting options are identical.

Transmission criteria	**Always transmit when the input is updated** Transmit only if the output changes Transmit cyclically

The transmission behaviour of the output can be configured here.

Always transmit when the input is updated: The output transmits the current object value to the KNX with every telegram that is received at the input.

Transmit only if the output changes: The output only transmits the current object value if the object value has changed compared to the last transmission process. The output always transmits during the first telegram to an input after the bus voltages return or after an ETS programming operation.

Transmit cyclically: With this setting, the output transmits the current object value to the KNX cyclically. After the bus voltage returns or after an ETS programming operation, the cyclical transmission is not started until the first telegram has been received at the input. The output also transmits as soon as a new telegram is received at the input. At the same time, the cycle time for cyclical transmission is restarted!

Transmission delay for sending the hours result (0...99)	**0**...99

An optional delay before result transmission (telegram at output) can be configured.

With the setting "always transmit when the input is updated": Telegrams at the output are only transmitted after the trigger when the delay has elapsed. The delay time is restarted by each telegram at the input.

With the setting "only transmit if the output changes": Telegrams are only sent when the object value changes at the output if the delay has expired. If the logic function is reprocessed by a new telegram at the input within the delay time and the object value changes again, then the delay restarts. If the object value of the output does not change due to new input telegrams, the delay does not restart.

This parameter defines the hours of the delay time.

Minutes (0...59)	**0**...59

This parameter defines the minutes of the delay time.

Seconds (0...59)	**0**...59

This parameter defines the seconds of the delay time.

The parameters for the transmission delay are only visible for "Transmission criteria" = "Always transmit when the input is updated" and "Only transmit when the output changes".

Cycle time hours (0...99)	**0**...99

During cyclical transmission of the output, this parameter defines the cycle time.

Setting the cycle time hours.

Minutes (0...59)	0...**5**...59

This parameter defines the minutes of the cycle time.

Seconds (0...59)	0...59
This parameter defines the seconds of the cycle time. The parameters for the cycle time are only visible if "transmission criteria" = "transmit cyclically".	

15.5.2 Object list for Comparator

Function	Name	Type	DPT	Flag
Comparator Input	Logic .. - Input	4-bit	3,007	C, -, W, -, U

4-bit object as input of a comparator.

This object is only available if the type of logic function is configured to "comparator" and the data format is configured to "4-bit dimming (DPT 3.007)".

Function	Name	Type	DPT	Flag
Comparator Input	Logic .. - Input	1-byte	20,102	C, -, W, -, U

1-byte object as input of a comparator.

This object is only available if the type of logic function is configured to "comparator" and the data format is configured to "1-byte operating mode switchover (DPT 20.102)".

Function	Name	Type	DPT	Flag
Comparator Input	Logic .. - Input	1-byte	18,001	C, -, W, -, U

1-byte object as input of a comparator.

This object is only available if the type of logic function is configured to "comparator" and the data format is configured to "1-byte scene extension unit (DPT 18.001)".

Function	Name	Type	DPT	Flag
Comparator Input	Logic .. - Input	1-byte	5,010	C, -, W, -, U

1-byte object as input of a comparator.

This object is only available if the type of logic function is configured to "comparator" and the data format is configured to "1-byte value 0...255 (DPT 5.010)".

Function	Name	Type	DPT	Flag
Comparator Input	Logic .. - Input	1-byte	5,001	C, -, W, -, U

1-byte object as input of a comparator.

This object is only available if the type of logic function is configured to "comparator" and the data format is configured to "1-byte brightness value 0...100% (DPT 5.001)".

Function	Name	Type	DPT	Flag
Comparator Input	Logic .. - Input	2-byte	7,001	C, -, W, -, U

2-byte object as input of a comparator.

This object is only available if the type of logic function is configured to "comparator" and the data format is configured to "2-byte value 0...65535 (DPT 7.001)".

Function	Name	Type	DPT	Flag
Comparator Input	Logic .. - Input	2-byte	8,001	C, -, W, -, U

2-byte object as input of a comparator.

This object is only available if the type of logic function is configured to "comparator" and the data format is configured to "2-byte value -32768...32767 (DPT 8.001)".

<table>
<tr><th>Function</th><th>Name</th><th>Type</th><th>DPT</th><th>Flag</th></tr>
<tr><td>Comparator Input</td><td>Logic .. - Input</td><td>2-byte</td><td>9.0xx</td><td>C, -, W, -, U</td></tr>
<tr><td colspan="5">2-byte object as input of a comparator.
This object is only available if the type of logic function is configured to "comparator" and the data format is configured to "2-byte floating point value (DPT 9.0xx)".</td></tr>
</table>

<table>
<tr><th>Function</th><th>Name</th><th>Type</th><th>DPT</th><th>Flag</th></tr>
<tr><td>Comparator Input</td><td>Logic .. - Input</td><td>4-byte</td><td>13,001</td><td>C, -, W, -, U</td></tr>
<tr><td colspan="5">4-byte object as input of a comparator.
This object is only available if the type of logic function is configured to "comparator" and the data format is configured to "4-byte value -2147483648...2147483647 (DPT 13.001)".</td></tr>
</table>

<table>
<tr><th>Function</th><th>Name</th><th>Type</th><th>DPT</th><th>Flag</th></tr>
<tr><td>Comparator Output</td><td>Logic .. - Output</td><td>1-bit</td><td>1,002</td><td>C, R, -, T, A</td></tr>
<tr><td colspan="5">1-bit object as output of a comparator. The output object is preset to 1-bit (DPT 1.002) and outputs the result of the comparison operation (ON = true / OFF = false).
This object is only available if the type of logic function is configured to "comparator".</td></tr>
</table>

15.6 Limit value switch

The limit value switch works with an input whose data format can be configured, and with a 1-bit output to output the result of the threshold evaluation. The limit value switch compares the value received at the input with two configurable hysteresis threshold values. Once the upper threshold value (H2) is reached or exceeded, the output can transmit a switching telegram (e. g. ON = true). If the value falls below the lower threshold value (H1), the output can transmit another switching telegram (e. g. OFF = false).
The switching telegrams can always be configured in the ETS when the threshold values are exceeded and undershot.

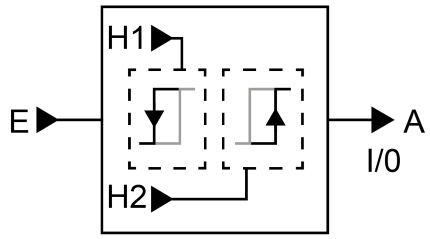


Figure 40: Limit value switch

The two threshold values define a hysteresis. The hysteresis prevents frequent switching back and forth of the output, provided that the input value changes continuously in small intervals. Only when the change in value at the input exceeds the hysteresis as a whole, does the output switch the status.

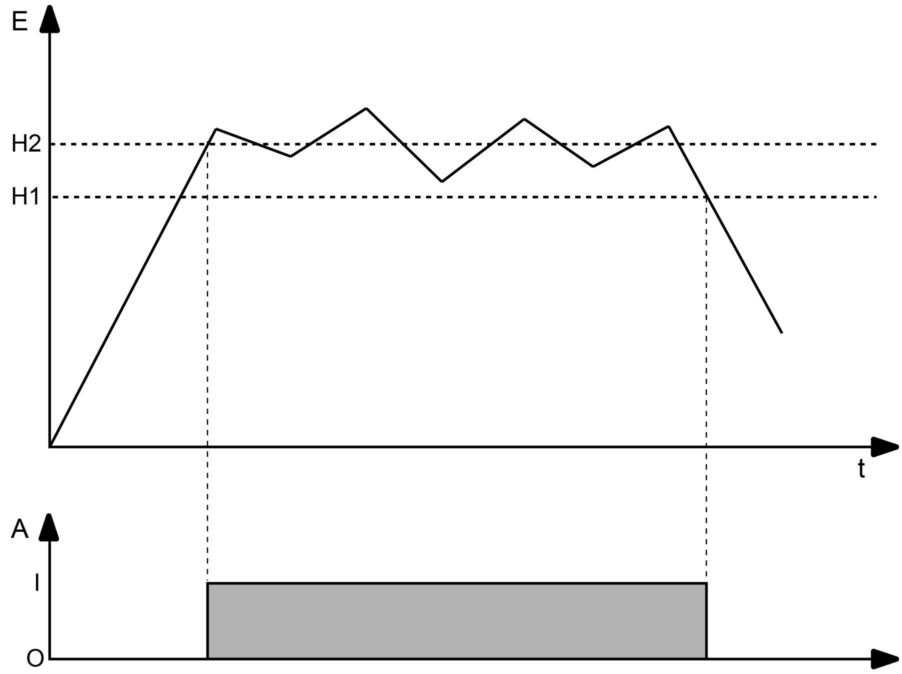


Figure 41: Example of a hysteresis evaluation by upper and lower threshold value

ⓘ The two threshold values can be freely configured in the ETS. Make sure that the upper threshold value is greater than the lower one!

After the bus voltage returns or after an ETS programming operation, the output always transmits a telegram when the first value has been received at the input. The telegram depends on whether the value reaches or exceeds the upper threshold (H2) or not. If the value is less than the upper threshold, a telegram is transmitted in accordance with "Telegram upon not reaching the lower threshold". Otherwise the output transmits the "telegram on exceeding the upper threshold value".

The parameter "data format" defines the size and format of input object according to the following table. The output object is preset to 1-bit (DPT 1.002) and outputs the result of the threshold evaluation (ON = true / OFF = false). The threshold values that can be set in the ETS adapt to the input data format.

Data format	KNX DPT
4-bit dimming	3,007
1-byte operating mode switchover	20,102
1-byte scene extension unit	18,001
1-byte value 0...255	5,010
1-byte brightness value 0...100%	5,001
2-byte value 0...655535	7,001
2-byte value -32768...32767	8,001
2-byte floating-point number	9.0xx
4-byte value -2147483648...2147483647	13,001

The transmission behaviour of the limit value switch can be configured.

15.6.1 Limit value switch parameters

Logic functions -> Logic function...

Data format	4-bit dimming (DPT 3.007) 1-byte operating mode switchover (DPT 20.102) 1-byte scene extension unit (DPT 18.001) **1-byte value 0...255 (DPT 5.010)** 1-byte brightness value 0...100% (DPT 5.001) 2-byte value 0...655,535 (DPT 7.001) 2-byte value -32,768...32,767 (DPT 8.001) 2-byte floating-point number (DPT 9.0xx) 4-byte value -2,147,483,648...2,147,483,647 (DPT 13.001)
This parameter defines the size and format of input object. The output object is preset to 1-bit (DPT 1.002) and outputs the result of the threshold evaluation (ON = true / OFF = false).	

Lower threshold value (H1)	**Dimming darker, stop (0)** Dim darker, 100% (1) Dim darker, 50% (2) Dim darker, 25% (3) Dim darker, 12.5% (4) Dim darker, 6% (5) Dim darker, 3% (6) Dim darker, 1.5% (7) Increase brightness, stop (8) Increase brightness, 100% (9) Increase brightness, 50% (10) Increase brightness, 25% (11) Increase brightness, 12.5% (12) Increase brightness, 6% (13) Increase brightness, 3% (14) Increase brightness, 1.5% (15)
This parameter defines the lower threshold value (H1) of the limit value switch. This parameter is available only if the "data format" is set to "4-bit dimming (DPT 3.007)".	

Lower threshold value (H1)	**Automatic mode (0)** Comfort mode (1) Standby mode (2) Night mode (3) Frost/heat protection (4)
This parameter defines the lower threshold value (H1) of the limit value switch. This parameter is only available if the "data format" is set to "1-byte operating mode switchover (DPT 20.102)".	

Lower threshold value (H1)	**Recall scene 1 (0)** Recall scene 2 (1) ... Recall scene 64 (63) Save scene 1 (128) Save scene 2 (129) ... Save scene 64 (191)
This parameter defines the lower threshold value (H1) of the limit value switch. This parameter will be available only if the "data format" is set to "1-byte scene extension unit (DPT 18.001)".	

Lower threshold value (H1) (0...255)	**0**...255
This parameter defines the lower threshold value (H1) of the limit value switch. This parameter will be available only if the "data format" is set to "1-byte value -0...255 (DPT 5.010)".	

Lower threshold value (H1) (0...100%)	**0**...100
This parameter defines the lower threshold value (H1) of the limit value switch. This parameter will be available only if the "data format" is set to "1-byte brightness value 0...100% (DPT 5.001)".	

Lower threshold value (H1) (0...65535)	**0**...65535
This parameter defines the lower threshold value (H1) of the limit value switch. This parameter will be available only if the "data format" is set to "2-byte value 0...65535 (DPT 7.001)".	

Lower threshold value (H1) (-32768...32767)	-32768...**0**...32767
This parameter defines the lower threshold value (H1) of the limit value switch. This parameter will be available only if the "data format" is set to "2-byte value -32768...32767 (DPT 8.001)".	

Lower threshold value (H1) (-671088...670760)	-671088...**0**...670760
This parameter defines the lower threshold value (H1) of the limit value switch. This parameter is only available if the "data format" is set to "2-byte floating point value (DPT 9.0xx)".	

Lower threshold value (H1) (-2147483648...2147483647)	-2147483648...**0**...2147483647
This parameter defines the lower threshold value (H1) of the limit value switch. This parameter will be available only if the "data format" is set to "4-byte value -2147483648...2147483647 (DPT 13.001)".	

Upper threshold value (H2)	**Dimming darker, stop (0)** Dim darker, 100% (1) Dim darker, 50% (2) Dim darker, 25% (3) Dim darker, 12.5% (4) Dim darker, 6% (5) Dim darker, 3% (6) Dim darker, 1.5% (7) Increase brightness, stop (8) Increase brightness, 100% (9) Increase brightness, 50% (10) Increase brightness, 25% (11) Increase brightness, 12.5% (12) Increase brightness, 6% (13) Increase brightness, 3% (14) Increase brightness, 1.5% (15)
This parameter defines the upper threshold value (H2) of the limit value switch. This parameter is available only if the "data format" is set to "4-bit dimming (DPT 3.007)".	

Upper threshold value (H2)	**Automatic mode (0)** Comfort mode (1) Standby mode (2) Night mode (3) Frost/heat protection (4)
This parameter defines the upper threshold value (H2) of the limit value switch. This parameter is only available if the "data format" is set to "1-byte operating mode switchover (DPT 20.102)".	

Upper threshold value (H2)	**Recall scene 1 (0)** Recall scene 2 (1) ... Recall scene 64 (63) Save scene 1 (128) Save scene 2 (129) ... Save scene 64 (191)
This parameter defines the upper threshold value (H2) of the limit value switch. This parameter will be available only if the "data format" is set to "1-byte scene extension unit (DPT 18.001)".	

Upper threshold value (H2) (0...255)	**0**...255
This parameter defines the upper threshold value (H2) of the limit value switch. This parameter will be available only if the "data format" is set to "1-byte value -0...255 (DPT 5.010)".	

Upper threshold value (H2) (0...100%)	**0**...100
This parameter defines the upper threshold value (H2) of the limit value switch. This parameter will be available only if the "data format" is set to "1-byte brightness value 0...100% (DPT 5.001)".	

Upper threshold value (H2) (0...65535)	**0**...65535
This parameter defines the upper threshold value (H2) of the limit value switch. This parameter will be available only if the "data format" is set to "2-byte value 0...65535 (DPT 7.001)".	

Upper threshold value (H2) (-32768...32767)	-32768...**0**...32767
This parameter defines the upper threshold value (H2) of the limit value switch. This parameter will be available only if the "data format" is set to "2-byte value -32768...32767 (DPT 8.001)".	

Upper threshold value (H2) (-671088...670760)	-671088...**0**...670760
This parameter defines the upper threshold value (H2) of the limit value switch. This parameter is only available if the "data format" is set to "2-byte floating point value (DPT 9.0xx)".	

Upper threshold value (H2) (-2147483648...2147483647)	-2147483648...**0**...2147483647
This parameter defines the upper threshold value (H2) of the limit value switch. This parameter will be available only if the "data format" is set to "4-byte value -2147483648...2147483647 (DPT 13.001)".	

Telegram on reaching or exceeding the upper threshold value	**ON telegram** OFF telegram
The telegram of the output upon reaching or exceeding the upper threshold can be configured here.	

Telegram on falling below the lower threshold value	ON telegram **OFF telegram**
The telegram of the output upon not reaching the lower threshold can be configured here.	

Transmission criteria	**Always transmit when the input is updated** Transmit only if the output changes Transmit cyclically
The transmission behaviour of the output can be configured here. Always transmit when the input is updated: The output transmits the current object value to the KNX with every telegram that is received at the input. Transmit only if the output changes: The output only transmits the current object value if the object value has changed compared to the last transmission process. The output always transmits during the first telegram to an input after the bus voltages return or after an ETS programming operation. Transmit cyclically: With this setting, the output transmits the current object value to the KNX cyclically. After the bus voltage returns or after an ETS programming operation, the cyclical transmission is not started until the first telegram has been received at the input. The output also transmits as soon as a new telegram is received at the input. At the same time, the cycle time for cyclical transmission is restarted!	

Transmission delay for sending the hours result (0...99)	0...99
An optional delay before result transmission (telegram at output) can be configured. With the setting "always transmit when the input is updated": Telegrams at the output are only transmitted after the trigger when the delay has elapsed. The delay time is restarted by each telegram at the input. With the setting "only transmit if the output changes": Telegrams are only sent when the object value changes at the output if the delay has expired. If the logic function is reprocessed by a new telegram at the input within the delay time and the object value changes again, then the delay restarts. If the object value of the output does not change due to new input telegrams, the delay does not restart. This parameter defines the hours of the delay time.	

Minutes (0...59)	0...59
This parameter defines the minutes of the delay time.	

Seconds (0...59)	0...59
This parameter defines the seconds of the delay time. The parameters for the transmission delay are only visible for "Transmission criteria" = "Always transmit when the input is updated" and "Only transmit when the output changes".	

Cycle time hours (0...99)	0...99
During cyclical transmission of the output, this parameter defines the cycle time. Setting the cycle time hours.	

Minutes (0...59)	0...5...59
This parameter defines the minutes of the cycle time.	

Seconds (0...59)	0...59
This parameter defines the seconds of the cycle time. The parameters for the cycle time are only visible if "transmission criteria" = "transmit cyclically".	

15.6.2 Object list for limit value switch

Function	Name	Type	DPT	Flag
Limit value switch Input	Logic... - Input	4-bit	3,007	C, -, W, -, U
4-bit object as input of a limit value switch. This object is only available if the type of logic function is configured to "limit value switch" and the data format is configured to "4-bit dimming (DPT 3.007)".				

Function	Name	Type	DPT	Flag
Limit value switch Input	Logic... - Input	1-byte	20,102	C, -, W, -, U
1-byte object as input of a limit value switch. This object is only available if the type of logic function is configured to "limit value switch" and the data format is configured to "1-byte operating mode switchover (DPT 20.102)".				

Function	Name	Type	DPT	Flag
Limit value switch Input	Logic... - Input	1-byte	18,001	C, -, W, -, U
1-byte object as input of a limit value switch. This object is only available if the type of logic function is configured to "limit value switch" and the data format is configured to "1-byte scene extension unit (DPT 18.001)".				

Function	Name	Type	DPT	Flag
Limit value switch Input	Logic... - Input	1-byte	5,010	C, -, W, -, U
1-byte object as input of a limit value switch. This object is only available if the type of logic function is configured to "limit value switch" and the data format is configured to "1-byte value 0...255 (DPT 5.010)".				

Function	Name	Type	DPT	Flag
Limit value switch Input	Logic... - Input	1-byte	5,001	C, -, W, -, U
1-byte object as input of a limit value switch. This object is only available if the type of logic function is configured to "limit value switch" and the data format is configured to "1-byte brightness value 0...100% (DPT 5.001)".				

Function	Name	Type	DPT	Flag
Limit value switch Input	Logic... - Input	2-byte	7,001	C, -, W, -, U
2-byte object as input of a limit value switch. This object is only available if the type of logic function is configured to "limit value switch" and the data format is configured to "2-byte value 0...65535 (DPT 7.001)".				

Function	Name	Type	DPT	Flag
Limit value switch Input	Logic... - Input	2-byte	8,001	C, -, W, -, U
2-byte object as input of a limit value switch. This object is only available if the type of logic function is configured to "limit value switch" and the data format is configured to "2-byte value -32768...32767 (DPT 8.001)".				

Function	Name	Type	DPT	Flag
Limit value switch Input	Logic... - Input	2-byte	9.0xx	C, -, W, -, U
2-byte object as input of a limit value switch. This object is only available if the type of logic function is configured to "limit value switch" and the data format is configured to "2-byte floating point value (DPT 9.0xx)".				

Function	Name	Type	DPT	Flag
Limit value switch Input	Logic... - Input	4-byte	13,001	C, -, W, -, U
4-byte object as input of a limit value switch. This object is only available if the type of logic function is configured to "limit value switch" and the data format is configured to "4-byte value -2147483648...2147483647 (DPT 13.001)".				

Function	Name	Type	DPT	Flag
Limit value switch Output	Logic .. - Output	1-bit	1,002	C, R, -, T, A
1-bit object as output of a limit value switch. The output object is preset to 1-bit (DPT 1.002) and outputs the result of the threshold evaluation (ON = true / OFF = false). This object is only available if the type of logic function is configured to "limit value switch".				

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