GIRA

Issue:
17.08.2015
135x7055

# Control 9 KNX

## Order No. 2079 00

# Table of Contents

# 1 Product definition

## 1.1 Product catalogue

| | |
|---|---|
| Product name: | Control KNX 9 |
| Use: | Controller |
| Design: | FM (flush-mounted) |
| Order No. | 2079 00 |

## 1.2 Function

The device is used primarily to display statuses with a KNX installation and to control system functions. The display elements are shown on a colour TFT monitor at a resolution of 800 x 480 pixels (22.7 cm [9"], 16:9). The elements are controlled by touching the TFT monitor (touch screen).
The PC-based device has an Intel Atom™ processor without a fan and different interfaces for communication (KNX bus connection, Ethernet network connection) and for the connection of optional periphery (USB ports, SD slot for memory expansion and data exchange, audio and video connections for supplementary multimedia components). Furthermore, the device is equipped with a colour camera and microphone.
Microsoft® Windows® XP Embedded serves as the operating system. Independent of the preinstalled KNX application, the device can therefore also be used for other applications (e. g. door communication, Internet access using a preinstalled web browser, email function). The installation and operation of KNX independent applications is performed as is standard in MS Windows, thereby allowing the device to be adapted flexibly to future applications.

The device displays all KNX functions clearly and concisely. By touching it is possible to execute functions such as switching, dimming and Venetian blind control, to save and recall light scenes as well as visualize and evaluate complex functions such as value transmitter, date and limiting values.
A clear and comprehensible menu navigation ensures fast access to the desired function. The use of predefined display pages available in the configuration software via a template library makes it possible to project design and commission the device in a uniform layout quickly and in a customer-friendly way.

A synchronisable real-time clock is available for setting up time switch functions and for logging events. Events or any other actions can be forwarded by a switching command using predefined e-mails. Furthermore, the device can be integrated into different light-scenes whose brightness values can be saved permanently in the device memory for situation-dependent control of a lighting system for KNX actuator groups.
The device can be used to implement presence simulation and datalogger functionality. The presence simulation can, for example give those outside the impression that a house is lived in, even though the owners are away. The owners can record any simulations over periods of time and play them back at any time. The datalogger provides the option of recording data, received from the KNX, in various formats, and displaying them on the unit. The data recorded by the datalogger can also be forwarded by e-mail.
If necessary, a signalling system can provide a security-orientated system to monitor doors and windows. Up to two different signalling areas (internal / external) can be armed and monitored for break-ins and sabotage. Thus visual and acoustic alarming is possible using additional KNX components (e.g. switching actuators) in conjunction with alarm encoders (flash light, internal siren).

Up to 5 password levels allow controlled access to different functions. It is possible here to assign one of four password levels to the screen pages. The signalling system can be protected against unauthorized access by its own password.
Commissioning is possible by IP via the ethernet interface or via memory access (USB memory stick, SD card, network drive).

The device has a mains voltage terminal for power supply to the device electronics. The KNX function part (BCU) is functional as long as mains voltage and bus voltage are switched on. The

device can be switched off or switched to standby mode to enable energy-saving operation, as in the case of prolonged absence. Different KNX functions (e.g. signalling system, presence simulation, timer...) remain active even when the device is in standby mode. If a device is switched off, display and signalling functions are deactivated permanently.

## 1.3 Accessories

| | |
|---|---|
| Design frame for Control 9 | Order No. 2080 .. |
| Flush-mounted housing/flush-mounted box for Control 9 | Order No. 2082 00 |
| Flush-mounted housing | Order No. 0639 00 |
| Adapter frame | Order No. 2081 00 |

# 2 Installation, electrical connection and operation

## 2.1 Safety instructions

**Electrical equipment may only be installed and fitted by electrically skilled persons. The applicable accident prevention regulations must be observed.**

**Before working on the device or exchanging the connected loads, disconnect it from the power supply (switch off the miniature circuit breaker), otherwise there is the risk of an electric shock.**

**Do not operate the screen with sharp or pointed objects. The touch-sensitive surface could be damaged.**

**Do not use sharp objects for cleaning. Do not use sharp cleaning agents, acids or organic solvents.**

**Failure to observe the instructions may cause damage to the device and result in fire and other hazards.**

## 2.2 Device components

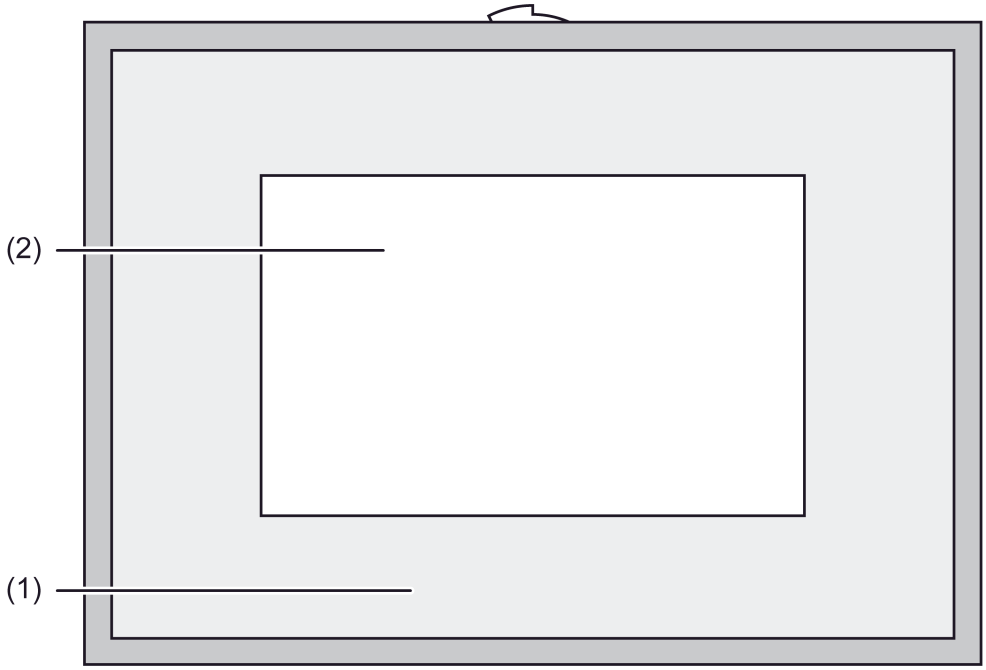


Figure 1: Device components, front side with design frame

(1) Design frame
(2) Screen with touchscreen surface

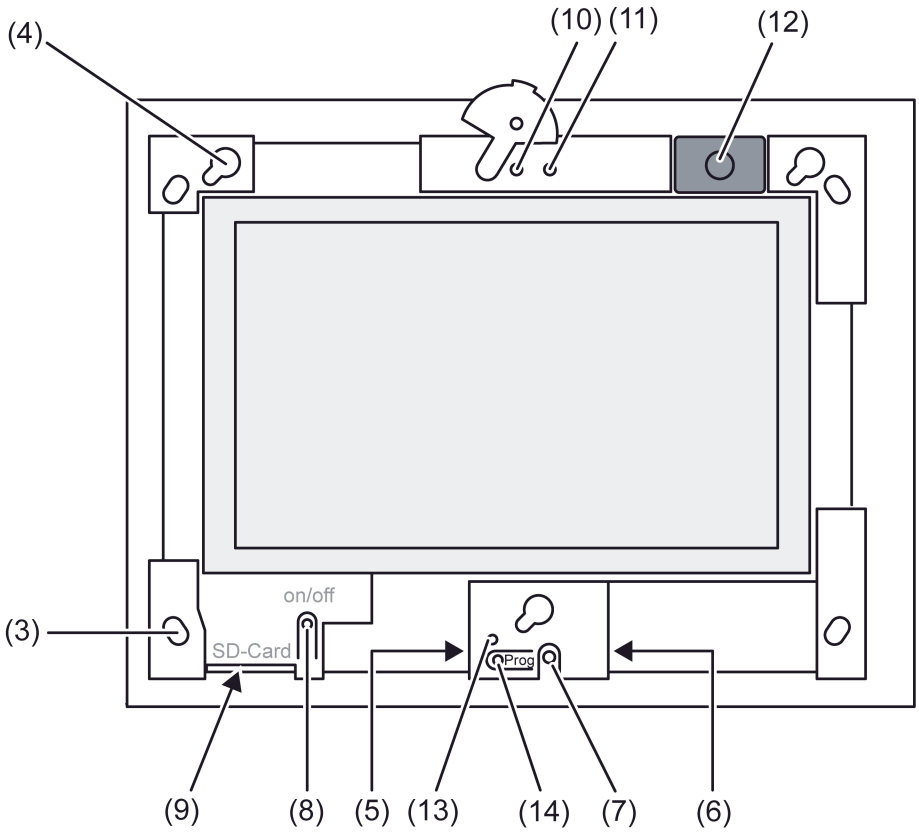


Figure 2: Device components, front side without design frame

(3) Holes for wall fastening
(4) Bracket for Design frame
(5) USB interface (1 x type Micro AB / reserved for future applications)
(6) USB socket for additional periphery (1 x type A)
(7) Internal microphone
(8) On/off push-button
(9) Slot for SD memory card
(10) Internal camera
(11) Camera operating display
(12) Internal loudspeaker
(13) KNX Programming LED
(14) KNX Programming button

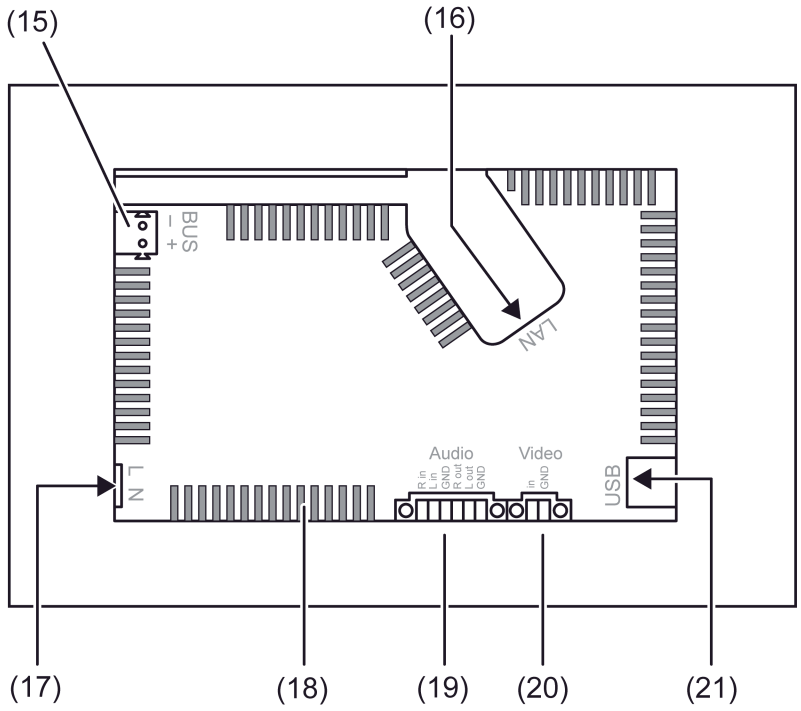


Figure 3: Device components, rear side

(15) KNX bus connection
(16) Ethernet network connection
(17) Mains voltage connection
(18) Ventilation openings
(19) Connections for analogue audio inputs and outputs
(20) Connection for analogue video input
(21) USB sockets for additional periphery (2 x type A)

## 2.3 Fitting and electrical connection

**DANGER!**

**Electrical shock when live parts are touched.**

**Electrical shocks can be fatal.**

**Before working on the device, disconnect the power supply and cover up live parts in the working environment.**

**Connecting and fitting the device**

i Recommendation: Install at eye-level, for optimal reading.

For wall-flush mounting: Use a Control 9 panel-mounted housing (see accessories).

For mounting in a panel-mounted housing for information terminals: use an adapter frame (see accessories).

Ensure sufficient cooling. Do not cover the ventilation openings (Figure 4).

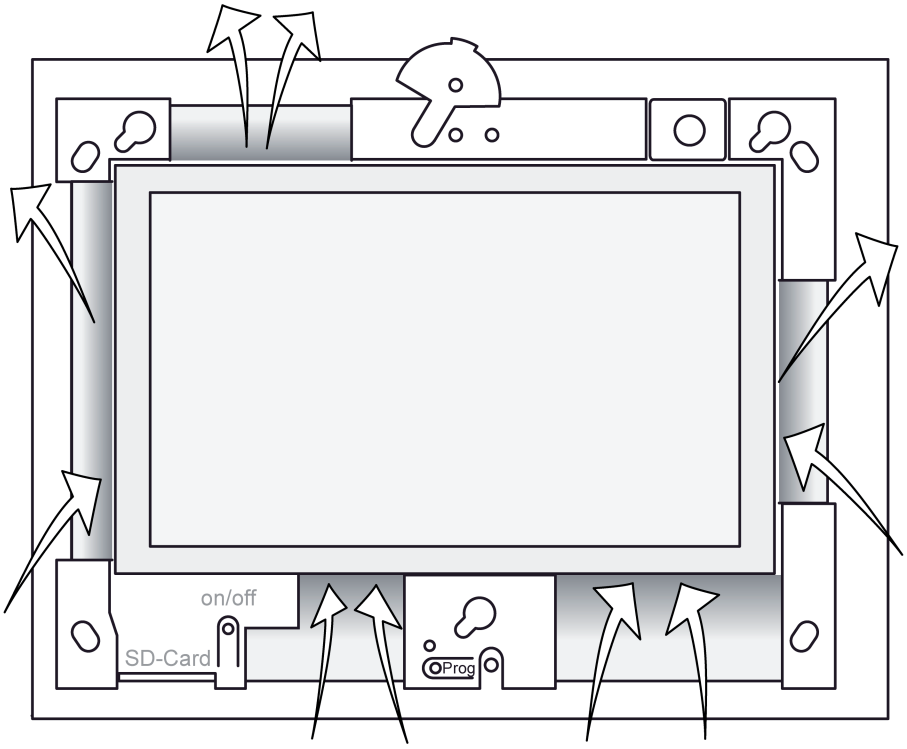


Figure 4: Ventilation and aeration of the device housing

- Install panel-mounted housing – horizontally – in the correct position in wall. Note labels **OBEN TOP** / **UNTEN BOTTOM**.

i Observe the mounting instructions of the installation housing.

The device has a mains voltage terminal for power supply to the device electronics. The KNX function part (BCU) is functional as long as mains voltage and bus voltage are connected and switched on.

- Pull the connecting cables through the designated bushings.

**DANGER!**

**Electrical shock when live parts are touched. The mains voltage and low voltage are located in a shared appliance box. If there is an error, other connected components may carry mains voltage.**

**Electrical shocks can be fatal.**

**Always secure the mains voltage with the enclosed tube.**

**Run the cables so that low voltage wires are securely protected against mains voltage.**

- Strip the mains voltage cable to the length of the enclosed silicon tube.
- Pull the supplied silicon tube over the stripped mains voltage wires **L** and **N**.
- Connect the mains voltage **L** and **N** to terminal (17).
- Connect the KNX bus line to the **BUS** terminal (15).
- Optional: Connect audio devices to terminal (19) (Figure 5).
- Optional: Connect the video device to terminal (20) (Figure 5).
- Optional: Connect USB devices to terminal (21).

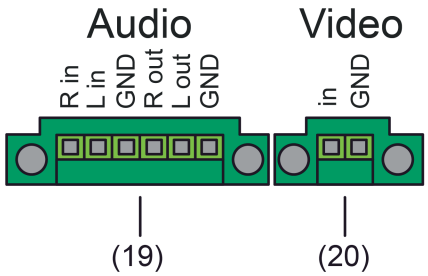


Figure 5: Terminals for audio and video connections

| Labelling | Function |
|---|---|
| Audio R in | Input, audio signal, right |
| Audio L in | Input, audio signal, left |
| Audio GND | Shared GND audio inputs |
| Audio R out | Output, audio signal, right |
| Audio L out | Output, audio signal, left |
| Audio GND | Shared GND audio outputs |
| Video in | Input, video signal |
| Video GND | GND video signal |

Connection assignment for audio and video connections

Use the Ethernet connection (16) together with the supplied Ethernet adapter plug and Ethernet adapter cable to connect to the IP network.

Pay attention to the correct colour assignment of the wires, EIA/TIA-568-A or -B. This can be found in the documentation of the installed network components and routers.

The Ethernet connection on the device is carried out according to EIA/TIA-568-B.

- Connect Ethernet installation cable to the Ethernet adapter plug. To do this, strip the Ethernet wires, do not skin, and insert into the cover of the adapter plug. Shorten any wires that are jutting out and push the cover onto the adapter plug in the correct position (Figure 6).
- Connect the supplied Ethernet adapter cable to the terminal (16) and Ethernet adapter plug.

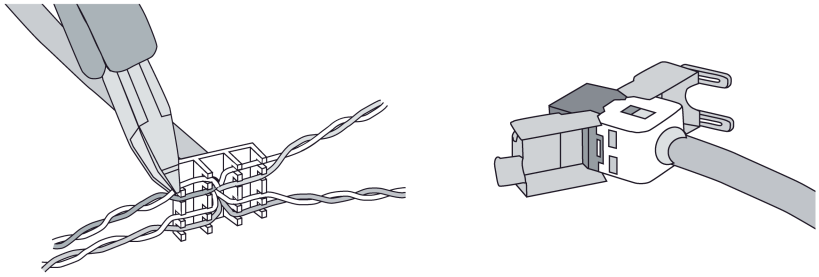

Figure 6: Fitting and connection of the Ethernet adapter plug

- Install device in panel-mounted housing. Use the screws supplied.
- Remove protective film from the touchscreen surface (2).
- Insert the Design frame in the correct direction into the designated brackets and push down and to the left - down and to the right for vertical mounting - to fix it.

## 2.4 Commissioning

### Commissioning

After installation of the device and connection of the KNX bus line, mains supply, Ethernet cable, and, if necessary, the optional periphery, the device can be put into operation. The commissioning is basically confined to programming of the physical address with the ETS and the loading of the configuration data by the configuration software.

### Programming the physical address

The physical address is programmed using a KNX data interface in the ETS programming.

Programming button (12) and LED (13) must be accessible.

In addition, the ETS project database must be imported and an appropriate device inserted in the project and a physical address assigned.

- Switch on the device.

  The device switches on the display and starts the booting process. After the operating system has been loaded, the device starts the KNX application and first displays the start screen. After a short waiting time, the project design last programmed in the device is displayed.
- Press the programming button (12).

  The programming LED (13) is illuminated.
- Program the physical address with the help of the ETS.

  The programming LED goes out if programming has been successful.
- Note the physical address on the device.

### Programming the configuration data

After the physical address has been programmed, the configuration data must be programmed into the device. The device is configured with the aid of the separate configuration software. Commissioning is possible by IP via the ethernet interface or via memory access (USB memory stick, SD card).

i The ETS programming function (IP, USB or RS232 data interface) cannot be used for programming the configuration data.

If necessary, remove the decorative frame installed during mounting from the front of the device.

- Switch on the device.

  The device switches on the display and starts the booting process. After the operating system has been loaded, the device starts the KNX application and first displays the start screen. After a short waiting time, the configuration last programmed in the device is displayed.
- Open the configuration software.
- The device is configured and parameterized with the aid of the configuration software.
- When the configuration has been completed, carry out the programming operation (see page 54).

  The progress of the programming operating is shown in the display of the device. When the programming operation has been completed, the device is initialised automatically. The Start screen is displayed during initialisation.
- This completes the commissioning process.

## 2.5 Operation

### 2.5.1 Touch surface

**Sensoric touchscreen surface**

The monitor possesses a sensoric surface, also know as a touch screen. The device is operated by touching the monitor surface with your finger or with special touch screen pens (not contained in the scope of supply).

i Do not use sharp objects for operation. The surface may be damaged and thus operation impeded.

**Cleaning the touchscreen**

The touchscreen requires regular cleaning in order to guarantee the optimum touch sensitivity. Keep the screen free of foreign bodies and dust.

- Set application to "Cleaning function".
- Clean the touchscreen carefully using a soft, lint-free cloth. If needed, moisten the cleaning cloth slightly.

i Do not use sharp cleaning agents, acids or organic solvents.

i Keep moisture from penetrating into the device. Do not spray the cleaning agent directly onto the screen surface.

i Do not use sharp objects for cleaning.

### 2.5.2 Operating elements on the device

**Removing the Design frame**

Certain operating elements are only accessible when the Design frame (1) has been removed (Figure 1).

- Hold the bottom of the Design frame with both hands.
- Carefully push the Design frame upwards to the right.
- When the Design frame is loose in the bracket, pull it carefully away from the wall.

**Mounting the Design frame**

- Insert the Design frame into the brackets (4) in the right position (Figure 2).
- Carefully push the Design frame downwards until it engages.

**Switching a device on or off**

The device can be switched off to enable energy-saving operation, as in the case of prolonged absence for instance. When switching off, the operating system is shut down. The display and signalling functions of the device are then deactivated permanently.

The On/off push-button (8) can be reached once the Design frame (1) has been removed.

- Switching on: Press the push-button (8).

  The device switches on after about 2 seconds.

  The operating system and KNX application (Autostart) are started.
- Terminate KNX application: Press push-button (8) 1 x briefly.

  The KNX application is terminated. The device changes to the Windows® operating system and displays the desktop.
- Switch off: Press the push-button (8) again 1 x briefly.

  - or -
- Press the Windows® "Start" button and select the "Shut Down" command in the Start menu. In the subsequent list box, select "Shut Down" again and press the "OK" button.

  The operating system shuts down the device.

  The device switches off.

i The start menu of the operating system is available via the Windows® taskbar. The taskbar is normally in the background and is therefore not visible. The taskbar can be accessed by connecting a USB keyboard. The KNX application can then also be terminated correctly, for example, via the "ALT + F4" shortcut key.

i Alternatively, the device can be shut down into standby mode via the Windows® start menu. Operating the touchscreen then immediately reactivates the device. Unlike switching off, the device in standby mode can also be reactivated by the KNX function part when an event occurs. The device is then able to perform display and signalling functions event-driven.
The energy saving is approximately the same if the device is switched off or in standby mode. The standby mode is recommended.

i The function of the pushbutton control (8) can be changed in the Windows® operating system within the energy management settings (System control -> Energy options -> Power switch processes) and adjusted to the requirements of the user.

ⓘ Different KNX functions (e.g. signalling system, presence simulation, timer...) remain active even when the device is switched off or in standby mode. The KNX function part (BCU) is functional in these cases provided that the mains voltage and bus voltage is available interruption-free. A device in standby mode can also be reactivated by the KNX function part. This does not work if a device is switched off. Display and signalling functions are then deactivated permanently.

**Carrying out a reset**

If the device can no longer be operated, e.g. after a program error, it can be reset and switched off. A complete reset is executed here i.e. all data not permanently saved is lost.

- Press the push-button (8) for approx. 5 seconds.

  The device switches off after about 5 seconds. The operating system is not safely shut down in the process.

ⓘ Different KNX functions (e.g. signalling system, presence simulation...) remain active even when the device is switched off. The KNX function part (BCU) is functional even when the device is switched off, provided that the mains voltage and bus voltage is available interruption-free.

### 2.5.3 Operation of the operating system

**Operating system and KNX application**

The operating system of the device is based on Microsoft® Windows® XP Professional in a memory-optimised version. All the components required for the device function are preinstalled. Additional drivers or programs, e.g. Gira software package QuadClient, can be installed in the Windows environment at any time later.

The KNX device application starts automatically after switching on the device (booting process). The KNX application that should always be in the foreground in normal operation must be minimized or even terminated in order to subsequently install other programs or drivers. It is possible to terminate the KNX application by briefly pressing the ON/OFF button (8). As a result, the device changes to the Windows® operating system and displays the desktop.
The KNX application can be minimized via the Windows taskbar. The Windows taskbar is normally in the background and is therefore not visible. The taskbar can be accessed by connecting a USB keyboard.

i When installing additional software or saving data, always observe the system resources available!

**Graphic Windows® user interface**

Once the KNX application has been minimized or terminated, the device provides a graphic Windows® user interface (Figure 7) with desktop (22) and taskbar (26) in activated state. The user can – as well as with other Windows PCs – modify the appearance accordingly.

i The Windows user interface and all other system programs are available with connected USB keyboard. A USB mouse can be connected to the device for easy operation if required.

Operation is carried out using a mouse pointer (23), which follows the operations of the touchscreen or the connected USB mouse. Brief touches of the screen are interpreted as actuation of the mouse buttons. The function of the right mouse button in touch operation can be activated using the mouse button switching (29). Text can be input using the Windows on-screen keyboard (25).

Figure 7: Windows screen elements

(22) Windows desktop
(23) Mouse pointer
(24) Start menu
(25) On-screen keyboard
(26) Taskbar
(27) System programs
(28) Preinstalled programs for the touchscreen calibration and for hiding the mouse pointer
(29) Mouse button switching
(30) Microsoft Windows terms and conditions

System programs are preinstalled in the info area of the taskbar (27), e.g. for the audio control and for network settings.

i The arrangements of the icons on the desktop or in the taskbar may vary from the representation shown.

**File-based write filter**

The device contains an SSD drive with no moving parts as a mass storage facility. To prevent accidental changes to the configuration, the drive is protected by a file-based write filter - File-Based Write Filter (FBWF). Write operations to the protected are a diverted to a virtual drive in the RAM. Changes to this data are shown in the directory but are only available until the device is restarted. The previous data is restored is the device is switched-off or there is a power failure.
Changes to the "My Documents" directory are excluded from write-protection and are always applied.

The write filter must be switched off, ...

- When directories are created, which are to remain intact after a restart,
- When programs are installed.

The system must be restarted, ...

- When the write filter is switched on or off,
- When the size of the virtual drive is changed,
- When memory compression is switched on or off

The user can change the settings for the file-based write filter.

**Installing programs**

Before installing additional programs, take the system requirements of the programs into account.

- Deactivate write filters: Select the program for the write protection settings using the mouse pointer(available on the desktop or in the taskbar).
- Select the menu item "Write protection".
  The window for the write filter settings opens.
- Deactivate write protection.
- Press the "Apply" button.
- Press the "Close" button.
- Shut down the device and restart it.
- Install the program, e.g. from a USB stick.
- Activate write filters: Reselect the program for the write protection settings using the mouse pointer.
- Select the menu item "Write protection".
- Activate write protection.
- Press the "Apply" button.
- Press the "Close" button.
- Shut down the device and restart it.

## 3 Technical data

| | |
|---|---|
| **General** | |
| Mark of approval | KNX / EIB / VDE |
| Storage/transport temperature | -10 ... +70 °C |
| Ambient temperature | 0 ... +35 °C |
| Relative humidity | 15 ... 85 % (No moisture condensation) |
| Protection class | II |
| Dimensions W×H×D | 268×220×65 mm (without design frame) |
| **Mains voltage supply** | |
| Rated voltage | AC 110 ... 230 V ~ |
| Mains frequency | 50 / 60 Hz |
| Fine-wire fuse | Littelfuse/Wickmann 372 1160 T 1.6 L 250 |
| Standby power | max. 1 W |
| Power consumption | max. 20 W |
| Power consumption | max. 8 W (Display off) |
| **KNX/EIB** | |
| KNX medium | TP |
| Commissioning mode | S-mode |
| Rated voltage KNX | DC 21 ... 32 V SELV |
| Power consumption KNX | typical 150 mW |
| Connection mode KNX | Connection terminal |
| **System** | |
| Clock speed | 1.1 GHz |
| L2 cache | 512 kB |
| RAM | 1 GB RAM |
| Memory card | SDHC, max. 32 GB |
| System chipset | Intel System-Controller Hub US15W |
| Audio controller | Realtek ALC888 |
| **Display** | |
| Type | TFT 22,9 cm [9"], WVGA |
| Resolution | 800×480 pixels |
| Format | 16:9 |
| Number of colours | 16.7 millions |
| Observation angle | ± 85 ° |
| **Camera** | |
| Resolution | 1.3 million pixels |
| **USB connection** | |
| USB version | 1.1/2.0 |
| **Ethernet connection** | |
| Type | 10/100 MBit/s Ethernet |
| Connection | RJ45-socket 8/4-pin |
| Protocols | TCP/IP, IMAPv4, POP3, SMTP, SNTP |
| DHCP | possible (set to active at the factory), AutoIP |
| **Connections Audio / Video** | |
| Audio output | Line-out, Stereo |
| Audio input | Line-in, Stereo |
| Video input | FBAS/CVBS, 1 Vss |

# 4 Software description

## 4.1 Software specification

| | |
|---|---|
| ETS search paths: | / Control KNX 9 |
| BAU used: | TPUART + µC |
| KNX type class: | 3g device with cert. PhL + stack + µC |
| Configuration: | S-mode with plug-in |

**Application program:**

| No. | Short description | Name | Version | from mask version |
|---|---|---|---|---|
| 1 | KNX display and operating panel with coloured touch display. | Control 9 KNX 501411 | 1.1 | 701 |

## 4.2 Software "501411"

### 4.2.1 Scope of functions

**Scope of functions**

- The device is used to control building functions and to display building statuses of various features of a KNX installation.

- Uniform screen layout by the use of predefined display pages available in the configuration software via a template library. This ensures fast and customer-friendly project design and commissioning of the device.

- The display elements can be configured to the functions switching, dimming, blinds, value display with various variables, light scene control, date, time, text display, datalogger display, restraint, operating mode switch of a heating/cooling system, collective feedback or load type of a dimmer actuator.

- The device possesses an Ethernet interface. Various embedded IP protocols allow event-driven email messages to be sent by the KNX application. It is also possible to use the Windows network functions independent of the KNX application.

- Up to 4 password levels allow controlled access to different display pages and functions. It is possible here to assign one password level each to the screen pages. The signalling system and commissioning function can be protected against unauthorized access by its own password.

- A weekly timer with up to 64 channels and a total of 128 switching times is available. The individual channels can be used for different functions (switching, values, light scenes, operating mode switching). A random and an astro function can be activated optionally on each timer switch channel. The switching times are programmed in the configuration software or directly on the device after commissioning.

- Up 24 light scenes with a total of 32 actuator groups can be created. The light scenes are set directly on the device after commissioning.

- There are up to 80 logical links available, each with up to 8 inputs, up to 12 multiplexers each with up to three channels and 40 timers with ON delay and OFF delay and a filter function.

- Up to 50 different fault messages can be used. Of these fault messages, up to 20 can be active simultaneously. Activation, acknowledgement and deactivation of fault messages can be logged in a message list.

- A presence simulation allows the recording or playing back of any simulations over specific periods of time.

- A datalogger provides the option of recording data received from the KNX in various formats, and displaying it on the device. The data recorded by the datalogger can also be forwarded by e-mail.

- If necessary, a signalling system can provide a security-orientated system to monitor doors and windows. Up to two different signalling areas (internal / external) can be armed and monitored for break-ins and sabotage. Thus visual and acoustic alarming is possible using additional KNX components (e.g. switching actuators) in conjunction with alarm encoders (flash light, internal siren).

- The project design takes place with configuration software independent of the ETS. Commissioning is possible via the Ethernet interface or via memory access (USB memory stick, SD card, network drive).

### 4.2.2 Notes on software

**Project design and commissioning**

The ETS application program described in this documentation with the number "...5014 1.1" is used in conjunction with the configuration software to configure and commission the device with the Gira order no. 2079 00 (Control 9 KNX).
The above-mentioned application cannot be programmed in other devices (e.g. InfoTerminal Touch with Ethernet interface - 2072 xx / InfoTerminal Touch - 2071 xx). There are different application programs available for this purpose.

**Operating system and KNX application**

The operating system of the device is based on Microsoft® Windows® XP Professional in a memory-optimised version. All the components required for the device function are preinstalled. Additional drivers or programs, e.g. Gira software package QuadClient, can be installed in the Windows environment at any time later.

The KNX device application starts automatically after switching on the device (booting process). The KNX application that should always be in the foreground in normal operation must be minimized or even terminated in order to subsequently install other programs or drivers. It is possible to terminate the KNX application by briefly pressing the ON/OFF button (8). As a result, the device changes to the Windows® operating system and displays the desktop.
The KNX application can be minimized via the Windows taskbar. The Windows taskbar is normally in the background and is therefore not visible. The taskbar can be accessed by connecting a USB keyboard.

i When installing additional software or saving data, always observe the system resources available!

**File-based write filter**

The device contains an SSD drive with no moving parts as a mass storage facility. To prevent accidental changes to the configuration, the drive is protected by a file-based write filter - File-Based Write Filter (FBWF). Write operations to the protected are a diverted to a virtual drive in the RAM. Changes to this data are shown in the directory but are only available until the device is restarted. The previous data is restored is the device is switched-off or there is a power failure.
Changes to the "My Documents" directory are excluded from write-protection and are always applied.

The write filter must be switched off, ...

- When directories are created, which are to remain intact after a restart,
- When programs are installed.

The system must be restarted, ...

- When the write filter is switched on or off,
- When the size of the virtual drive is changed,
- When memory compression is switched on or off

The user can change the settings for the file-based write filter.

**Installing programs**

Before installing additional programs, take the system requirements of the programs into account.

- Deactivate write filters: Select the program for the write protection settings using the mouse pointer(available on the desktop or in the taskbar).
- Select the menu item "Write protection".

The window for the write filter settings opens.

- Deactivate write protection.
- Press the "Apply" button.
- Press the "Close" button.
- Shut down the device and restart it.
- Install the program, e.g. from a USB stick.
- Activate write filters: Reselect the program for the write protection settings using the mouse pointer.
- Select the menu item "Write protection".
- Activate write protection.
- Press the "Apply" button.
- Press the "Close" button.
- Shut down the device and restart it.

### 4.2.3 Object table

| | |
|---|---|
| Number of communication objects: | max. 2,000<br>Generated dynamically |
| Number of addresses (max): | 3,000 |
| Number of assignments (max): | 3,000 |
| Dynamic table management | no |

i The communication objects are generated dynamically by the configuration software according to requirements. The available object resources of the device define the number of configurable objects. The resources can be reduced depending on the configured functions and data formats thus used. The device has the following object resources in the unconfigured state...
1-bit (Switching): 800
2-bit (Restraint): 50
4-bit (Relative dimming): 300
1-byte (Value): 300
2-byte (Value): 200
3-byte (Date, Time): 50
4-byte (Value): 200
14-byte (Text): 100

i Within the ETS (Project view), all configured objects are each displayed independently with allocated group addresses after a data comparison (see page 51) depending on the data format. Dynamic objects of the visualisation are displayed without identification of the function affiliation, i.e. objects are not identified with the display texts of the functions (e.g. the object name "switching object" or "dimming object"). For predefined functions (e.g. signalling system or presence simulation) the objects are labelled by function affiliation (e.g. object name "ready to arm internal [Signalling system input]" or "Playback Start/Stop [presence simulation]").
Group addresses may only be linked with communication objects in the configuration software! The data management in the ETS project is only for maintaining the address table (specification of the data formats) and for generating filter tables for backbone/line couplers.

i The communication objects for display and operating functions of the visualisation are dependent on the corresponding configured KNX function. This documentation describes these objects in detail and function specifically in the chapters of the predefined display and operating functions (see page 57).

**Object for the status line**

Function: Status line

| Object | Function | Name | Type | DPT | Flag |
|---|---|---|---|---|---|
|  | 2-byte object | Interior temperature | 2 byte | 9.001 | C, W |

Description: 2-byte object for receiving a current room indoor temperature. The received value is displayed in the status line.
Displayable value range: -99 to +99.

| Function: | Status line | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 2-byte object | Outdoor temperature | 2 byte | 9.001 | C, W |

Description 2-byte object for receiving a current outdoor temperature. The received value is displayed in the status line.
Displayable value range: -99 to +99.

**Object for display illumination**

| Function: | Display illumination | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Display illumination | 1-bit | 1.001 | C, W |

Description 1 bit object, using which the display background lighting can be switched off and on. Telegram polarity configurable.
After a time interval set in the configuration software has elapsed, the lighting automatically switches back to the basic level of brightness.

**Objects of the system clock**

| Function: | Time | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 3-byte object | Time object | 3 byte | 10.001 | C, W, T |

Description 3 byte object with which the device can send the internal time to the bus cyclically or on request.

| Function: | Date | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 3-byte object | Date object | 3 byte | 11.001 | C, W, T |

Description 3 byte object with which the device can send the internal date to the bus cyclically or on request.

Function: Date / time request by external device

| Object | Function | Name | Type | DPT | Flag |
|---|---|---|---|---|---|
|  | 1-bit object | Request date / time by external device | 1-bit | 1.001 | C, W |

Description: 1 bit object, using which the device can receive a request telegram from another KNX subscriber (depending on parameters). The device responds to an external poll by transmitting the data and/or time telegram via the "Date object" and "Time object" objects. You can use the configuration software to configure which of these telegrams is sent. The telegram polarity of the external poll telegram can be configured.

Function: Master clock date

| Object | Function | Name | Type | DPT | Flag |
|---|---|---|---|---|---|
|  | 3-byte object | Master date | 3 byte | 11.001 | C, W, T |

Description: 3 byte object, with which the device can receive the current date from a KNX master clock for synchronisation (parameter-dependent).

Function: Master clock time

| Object | Function | Name | Type | DPT | Flag |
|---|---|---|---|---|---|
|  | 3-byte object | Master time | 3 byte | 10.001 | C, W, T |

Description: 3 byte object, with which the device can receive the current time from a KNX master clock for synchronisation (parameter-dependent).

Function: Master clock date / time request

| Object | Function | Name | Type | DPT | Flag |
|---|---|---|---|---|---|
|  | 1-bit object | Request date / time | 1-bit | 1.001 | C, T |

Description: 1 bit object, using which a request telegram for the data and time on the KNX can be transmitted (depending on parameters). In this way, the device can poll the date and current time from another bus subscriber, e.g. Master clock. The response of the master is then expected via the objects "MasterDate" and "MasterTime".
The request is made after a restart and then every night at 4.00 am. The telegram polarity can be configured.

**Objects for external open pages**

| Function: | Open page | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Open page [open page external] | 1-bit | 1.001 | C, W |

Description 1-bit object with which display pages can be opened directly. An opened page immediately appears on the device display. Each display page has its own object that can be enabled in the configuration software if required.

**Object for disabling function of the device**

| Function: | Device disabling function | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Disabling object of devices [disable device] | 1-bit | 1.001 | C, W |

Description 1-bit object for activation and deactivation of the device disabling function (polarity configurable). A disabled device displays a disabling logo on the screen (optional) and can execute a special disabling function if required. All other display and operating functions are then out of operation.

**Object for the digital picture frame**

| Function: | Digital picture frame disabling function | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Disable object [digital picture frame] | 1-bit | 1.001 | C, W |

Description 1-bit object for disabling the digital picture frame (polarity configurable). This is advisable, for instance, if the image display should not be started or interrupted at certain times of the day or night because they have a disturbing effect on the environment. An image display that has already started can be cancelled by the disabling object. A restart of the image display is only possible when the disabling object is deactivated.

**Objects for the datalogger**

| Function: | Datalogger | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1/2/4-byte object | Recording object [Datalogger channel] | 1 byte<br>2 byte<br>4 byte | 5.001...<br>5.004<br>5.010<br>6.010<br>7.001<br>8.001<br>9.001...<br>9.021<br>12.001<br>13.001<br>14.000<br>...<br>14.079 | C, W |

Description Object with settable type, whose value is recorded by the device at settable times and which can be displayed in a display element as a datalogger channel as a diagram on the screen.

**Objects for the logic gate**

| Function: | Logic gate inputs | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Input object [logic gate] | 1-bit | 1.001 | C, W |

Description 1 bit objects, which can be logically linked to each other. Each input object of a logic gate can be processed either normally or inverted.

| Function: | Logic gates | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Start object [logic gates] | 1-bit | 1.001 | C, W, T |

Description 1 bit object, which outputs the result of the logical link. The type of link (AND, OR, EXCLUSIVE OR, AND with return), the behaviour (normal or inverted) and the transmit criterion (transmit on any input event or send on changing the output) can be set.

| Function: | Logic gates | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Disabling object [Logic gate] | 1-bit | 1.001 | C, W |

Description 1-bit object for disabling or enabling the gate output (polarity configurable).

**Objects for the demultiplexer**

| Function: | Demultiplexer | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1/4-bit object,<br>1/2/4-byte object | Input object<br>[Demultiplexer] | 1-bit<br>4-bit<br>1 byte<br>2 byte<br>4 byte | 1.001…<br>1.008<br>3.007<br>5.001...<br>5.004<br>5.010<br>6.010<br>7.001<br>8.001<br>9.001...<br>9.021<br>12.001<br>13.001<br>14.000<br>...<br>14.079 | C, W |

Description Object with adjustable type, who value is forwarded to one of two or four output objects according to one or control objects.

| Function: | Demultiplexer | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Control object 1/2<br>[Demultiplexer] | 1-bit | 1.001 | C, W |

Description 1 bit object which specifies to which output object the value of the corresponding input object is forwarded.
Two control objects may be visible, depending on the configured function (1 to 2 demultiplexers or 1 to 4 demultiplexers).

| Function: | Demultiplexer | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1/4-bit object,<br>1/2/4-byte object | Start object 1/2/3/4<br>[Demultiplexer] | 1-bit<br>4-bit<br>1 byte<br>2 byte<br>4 byte | 1.001…<br>1.008<br>3.007<br>5.001...<br>5.004<br>5.010<br>6.010<br>7.001<br>8.001<br>9.001...<br>9.021<br>12.001<br>13.001<br>14.000<br>...<br>14.079 | C, W, T |

Description One of two or one of four output objects receiving the value of the input object.

| Function: | Demultiplexer | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Disabling object [Demultiplexer] | 1-bit | 1.001 | C, W |

Description 1-bit object which specifies whether the value of the active output object of the demultiplexer can be transmitted (polarity configurable).

**Objects for the timers**

| Function: | Timer | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Input object [Timer] | 1-bit | 1.001 | C, W |

Description 1 bit object, whose value is forwarded to the output object of the timer, depending on the value of the appropriate disabling object, the set filter function and the defined delays.

| Function: | Timer | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Start object [Timer] | 1-bit | 1.001 | C, W, T |

Description 1 bit object which forwards the logical switching state of the timer output.

| Function: | Timer | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | Timer | Disabling object [timer] | 1-bit | 1.001 | C, W |

Description 1-bit object which specifies whether the value of the corresponding input object is forwarded to the output object (polarity configurable).

**Objects for the limiting values**

| Function: | Limiting value | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1/2/4-byte object | Value object [limiting value input] | 1 byte<br>2 byte<br>4 byte | 5.001...<br>5.004<br>5.010<br>6.010<br>7.001<br>8.001<br>9.001...<br>9.021<br>12.001<br>13.001<br>14.000<br>...<br>14.079 | C, W |

Description: Object with adjustable type for transferring the input value to a limiting value module. The value received via this object is compared continuously with the configured limiting values. The limiting value modules have one value input object each.

| Function: | Limiting value | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Upper limiting value [limiting value output] | 1-bit | 1.001 | C, W, T |

Description: 1-bit object for monitoring the upper limiting value. If the upper limiting value is exceeded or fallen short of (minus hysteresis), the configured switching telegram is transmitted via this object.

| Function: | Limiting value | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Lower limiting value [limiting value output] | 1-bit | 1.001 | C, W, T |

Description: 1-bit object for monitoring the lower limiting value. If the lower limiting value is fallen short of or exceeded (plus hysteresis), the configured switching telegram is transmitted via this object.

**Objects for status timer**

| Function: | Timer switching channel | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Switching | 1-bit | 1.001 | C, W, T |

Description 1-bit object for outputting switching telegrams of a switching channel of the type "Switching".

| Function: | Timer switching channel | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Comfort object [timer] | 1-bit | 1.001 | C, W, T |

Description 1-bit object for outputting telegrams for switching over to the "Comfort" operating mode (control of a room temperature controller) of a switching channel of the type "operating mode switch 4 x 1-bit".

| Function: | Timer switching channel | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Standby object [timer] | 1-bit | 1.001 | C, W, T |

Description 1-bit object for outputting telegrams for switching over to the "Standby" operating mode (control of a room temperature controller) of a switching channel of the type "operating mode switch 4 x 1-bit".

| Function: | Timer switching channel | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Night reduction object [Timer] | 1-bit | 1.001 | C, W, T |

Description 1-bit object for outputting telegrams for switching over to the "Night" operating mode (control of a room temperature controller) of a switching channel of the type "operating mode switch 4 x 1-bit".

| Function: | Timer switching channel | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Frost/heat protection object [Timer] | 1-bit | 1.001 | C, W, T |

Description 1-bit object for outputting telegrams for switching over to the "Frost/heat protection" operating mode (control of a room temperature controller) of a switching channel of the type "operating mode switch 4 x 1-bit".

| Function: | Timer switching channel | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-byte object | Operating mode [Timer] | 1 byte | 20.102 | C, W, T |

Description 1-byte object for outputting telegrams for KNX operating mode switchover (control of a room temperature controller) of a switching channel of the type "operating mode switch KNX".

| Function: | Timer switching channel | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1/2/4-byte object | Value object [Timer] | 1 byte<br>2 byte<br>4 byte | 5.001...<br>5.004<br>5.010<br>6.010<br>7.001<br>8.001<br>9.001...<br>9.021<br>12.001<br>13.001<br>14.000<br>...<br>14.079 | C, W, T |

Description Object with adjustable type for outputting value telegrams of a switching channel of the type "Value".

**Objects for the event mails**

| Function: | Event e-mail | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Send e-mail [E-Mail] | 1-bit | 1.001 | C, W |

Description 1-bit object for transmission of an event email. If a telegram with the configured polarity is received via this object, the device transmits a preconfigured event email. A separate object is available for each event email.

**Objects for the signalling system**

| Function: | Signalling system | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Detector [signalling system input] | 1-bit | 1.001 | C, W, T |

Description: 1 bit object as detector input. There is exactly one detector object for each created detector input for the internal and external skin security areas. The group address of exactly one KNX detector is linked to this object. The telegram polarity of the detector telegram can be configured.
The signalling system cyclically tests the function of a KNX detector, by the system transmitting a value read telegram to the bus via the detector object. The KNX detector (e.g. the channel of a button interface of a binary input) must answer the read telegram of the signalling system with a value answer telegram. For this, the "Read" flag must be set on the communication object of the KNX detector.

| Function: | Signalling system | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Internally armed, external skin monitoring [signalling system input] | 1-bit | 1.001 | C, W |

Description: 1 bit object to arm and unarm the external skin monitoring (internally armed).
0 = Unarm / 1 = Arm

| Function: | Signalling system | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Externally armed, internal and external skin monitoring [signalling system input] | 1-bit | 1.001 | C, W |

Description: 1 bit object to arm and unarm the internal and external skin monitoring (externally armed).
0 = Unarm / 1 = Arm

| Function: | Signalling system | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Sabotage [signalling system input] | 1-bit | 1.001 | C, W |

Description: 1 bit object as a sabotage of the signalling system. The sabotage detector can be connected to this object.
0 = No sabotage, detector inactive / 1 = Sabotage, detector active

Function: Signalling system

| Object | Function | Name | Type | DPT | Flag |
|---|---|---|---|---|---|
|  | 1-bit object | Ready to arm, internal [signalling system output] | 1-bit | 1.001 | C, T |

Description 1 bit object to signal that the signalling system is internally ready to arm. The system is only internally ready to arm when none of the detectors allocated to the external skin is active and there is no fault.
0 = Not ready to arm / 1 = Ready to arm

Function: Signalling system

| Object | Function | Name | Type | DPT | Flag |
|---|---|---|---|---|---|
|  | 1-bit object | Ready to arm, external [signalling system output] | 1-bit | 1.001 | C, T |

Description 1 bit object to signal that the signalling system is externally ready to arm. The system is only externally ready to arm when none of the detectors allocated to the internal skin and the external skin is active and there is no fault.
0 = Not ready to arm / 1 = Ready to arm

Function: Signalling system

| Object | Function | Name | Type | DPT | Flag |
|---|---|---|---|---|---|
|  | 1-bit object | Arming message, internal [signalling system output] | 1-bit | 1.001 | C, T |

Description 1 bit object for static signalling that the signalling system has successfully armed internally, i.e. the external skin monitoring is active.
0 = External skin monitoring not armed / 1 = External skin monitoring armed

Function: Signalling system

| Object | Function | Name | Type | DPT | Flag |
|---|---|---|---|---|---|
|  | 1-bit object | Arming message, external [signalling system output] | 1-bit | 1.001 | C, T |

Description 1 bit object for static signalling that the signalling system has successfully armed externally, i.e. the internal ad external skin monitoring is active.
0 = Internal/external skin monitoring not armed / 1 = Internal/external skin monitoring armed

Function: Signalling system

| Object | Function | Name | Type | DPT | Flag |
|---|---|---|---|---|---|
|  | 1-bit object | Alarm [signalling system output] | 1-bit | 1.001 | C, T |

Description 1 bit object to signal a break-in or sabotage alarm.
0 = No alarm / 1 = Alarm

Function: Signalling system

| Object | Function | Name | Type | DPT | Flag |
|---|---|---|---|---|---|
|  | 1-bit object | Fault [signalling system output] | 1-bit | 1.001 | C, T |

Description: 1 bit object for signalling a fault within the signalling system (missing detector, active sabotage input).
0 = No fault / 1 = Fault.

---

Function: Signalling system

| Object | Function | Name | Type | DPT | Flag |
|---|---|---|---|---|---|
|  | 1-bit object | Optical signal encoder [signalling system output] | 1-bit | 1.001 | C, T |

Description: 1 bit object to control an optical alarm, e.g. flashlight. If there is an alarm (only with external arming), signalling is carried out via this alarm output. In addition, with external arming, an acknowledgement can be given by the optical alarm encoder (parameter-dependent).
0 = No alarm, flashlight off / 1 = Alarm, flashlight on

---

Function: Signalling system

| Object | Function | Name | Type | DPT | Flag |
|---|---|---|---|---|---|
|  | 1-bit object | Internal siren [signalling system input] | 1-bit | 1.001 | C, T |

Description: 1 bit object to control an acoustic alarm, e.g. internal siren. If there is an alarm (internal or external arming), signalling is carried out via this alarm output. If there is an alarm, control of this alarm output is restricted to a certain period of time. This switching time can be configured in the configuration software.
0 = No alarm, internal siren off / 1 = Alarm, internal siren on

---

Function: Signalling system

| Object | Function | Name | Type | DPT | Flag |
|---|---|---|---|---|---|
|  | 1-bit object | Arming acknowledgement [Signalling system output] | 1-bit | 1.001 | C, T |

Description: 1 bit object to signal that the signalling system was armed internally or externally. The object is dynamic, meaning that it is only "1" for the arming acknowledgment time specified in the configuration software. In the unarmed state or if the arming acknowledgment time has elapsed, the object value is "0".
For example, appropriate pulse disabling elements can be connected to this signal output.

Function: Signalling system

| Object | Function | Name | Type | DPT | Flag |
|---|---|---|---|---|---|
|  | 1-bit object | Unarming acknowledgement [signalling system output] | 1-bit | 1.001 | C, T |

Description

1 bit object to signal that the signalling system was unarmed internally or externally. The object is dynamic, meaning that it is only "1" for the unarming acknowledgment time specified in the configuration software. In the armed state or if the unarming acknowledgment time has elapsed, the object value is "0".
For example, appropriate pulse disabling elements can be connected to this signal output.

---

Function: Signalling system

| Object | Function | Name | Type | DPT | Flag |
|---|---|---|---|---|---|
|  | 1-bit object | Alarm detector text [signalling system output] | 14 byte | 16.001 | C, T |

Description

14 byte object to transfer a 14 character detector text to the bus. If there is an alarm, the signalling system sends the signal text of the detector triggering the alarm to the bus via this object. The detector text can be configured separately for each detector in the configuration software.

---

Function: Signalling system

| Object | Function | Name | Type | DPT | Flag |
|---|---|---|---|---|---|
|  | 1-bit object | Detector text fault [signalling system output] | 14 byte | 16.001 | C, T |

Description

14 byte object to transfer a 14 character detector text to the bus. If there is an alarm, the signalling system sends the signal text of the detector which caused the fault (missing detector) to the bus via this object. The detector text can be configured separately for each detector in the configuration software.

---

Function: Signalling system

| Object | Function | Name | Type | DPT | Flag |
|---|---|---|---|---|---|
|  | 1-bit object | Prealarm signalling, internal [signalling system output] | 1-bit | 1.001 | C, T |

Description

1 bit object to signal an elapsing prealarm with internal arming. In the case of a previously detected break-in or sabotage alarm, this signal output is active "1" for the length of the alarm delay time configured in the configuration software. Otherwise the object value is "0".

| Function: | Signalling system | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Prealarm signalling, external [signalling system output] | 1-bit | 1.001 | C, T |

Description 1 bit object to signal an elapsing prealarm with external arming. In the case of a previously detected break-in or sabotage alarm, this signal output is active "1" for the length of the alarm delay time configured in the configuration software. Otherwise the object value is "0".

**Objects for the fault message function**

| Function: | Fault message | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Fault signal object | 1-bit | 1.001 | C, W |

Description 1-bit object for the reception of a fault message (polarity configurable). Each fault message has its own object.

| Function: | Fault message | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 14-byte object | ASCII text object | 14 byte | 16.001 ... 16.002 | C, W, T |

Description 14 byte object to display a variable message text with a fault message activated. Each fault message has its own object.

| Function: | Fault message | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Acknowledgement object | 1-bit | 1.001 | C, T |

Description 1-bit object to confirm a received fault message (polarity configurable). Each fault message has its own object.

| Function: | Fault message | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Acknowledgement reception object | 1-bit | 1.001 | C, W |

Description 1-bit object that can receive confirmations from other devices (polarity configurable). Each fault message has its own object.

**Object for scene function**

| Function: | Scene function | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-byte object | Extension object [light scenes] | 1 byte | 18.001 | C, W |
| Description | 1 byte object for opening or saving light scenes. | | | | |

| Function: | Scene function | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object,<br>1/2-byte object | Light scene object [light scenes] | 1-bit<br>1 byte<br>2 byte | 1.001<br>5.001...<br>5.004<br>9.001...<br>9.021 | C, W, T |
| Description | Object with settable type for controlling the actuator group contained in a scene function. | | | | |

**Objects for the presence simulation**

| Function: | Presence simulation | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Playback active [presence simulation] | 1-bit | 1.001 | C, T |
| Description | 1 bit object, which displays that a presence simulation is being played.<br>0 = Presence simulation not being played / 1 = Presence simulation being played. | | | | |

| Function: | Presence simulation | | | | |
|---|---|---|---|---|---|
| Object | Function | Name | Type | DPT | Flag |
|  | 1-bit object | Recording active [presence simulation] | 1-bit | 1.001 | C, T |
| Description | 1 bit object, which displays that a presence simulation is being recorded.<br>0 = Presence simulation not being recorded / 1 = Presence simulation being recorded. | | | | |

Function: Presence simulation

| Object | Function | Name | Type | DPT | Flag |
|---|---|---|---|---|---|
|  | 1-bit object | Recording Start/Stop [presence simulation] | 1-bit | 1.001 | C, W |

Description 1 bit object, with which the playback of a presence situation can be started and stopped.
0 = Stop presence simulation / 1 = Start presence simulation.

Function: Presence simulation

| Object | Function | Name | Type | DPT | Flag |
|---|---|---|---|---|---|
|  | 1-bit object,<br>1-byte object | Recording object [presence simulation] | 1-bit<br>1 byte | 1.001<br>5.001...<br>5.004 | C, W, T |

Description Object with adjustable type (1 bit or 1 byte), whose received telegram values can be saved by time by the device during a recording. The recorded telegrams can later be transmitted when playing back on the bus.

### 4.2.4 Functional description

**Introduction**

The device is used primarily to display statuses within a KNX installation and to control system functions. The display elements are shown on a colour TFT monitor at a resolution of 800 x 480 pixels (22.7 cm [9"], 16:9). The elements are controlled by touching the TFT monitor (touch screen).

The device displays all KNX functions clearly and concisely. By touching it is possible to execute functions such as switching, dimming and Venetian blind control, to save and recall light scenes as well as visualize and evaluate complex functions such as value transmitter, date and limiting values.
A clear and comprehensible menu navigation ensures fast access to the desired function. The use of predefined display pages available in the configuration software via a template library makes it possible to project design and commission the device in a uniform layout quickly and in a customer-friendly way.

#### 4.2.4.1 Available device resources

**Object resources**

The number of configurable device functions depends on the communication objects available. The communication objects are generated dynamically by the configuration software according to requirements. The resources can be reduced depending on the configured functions and data formats thus used. The device has the following object resources in the unconfigured state...

| Object type | Number of available objects |
|---|---|
| 1-bit (Switching) | 800 |
| 2-bit (Restraint) | 50 |
| 4-bit (Relative dimming) | 300 |
| 1-byte (value) | 300 |
| 2-byte (value) | 200 |
| 3-byte (Date, Time) | 50 |
| 4-byte (value) | 200 |
| 14-byte (Text) | 100 |
| Total: | **2,000** |

Available object resources dependent on the object types

The device provides a max. of 3,000 connections between objects and group addresses.

**Function resources**

The following resources are available for the individual functions of the device...

- Display and operating functions: max. 50 rooms each with max. of 40 KNX functions (but no more than a total of 300 functions!) in a max. of 10 function units
- Building sections: max. 10
- Internal open pages: max. 100
- Scene recalls: max. 40
- Signalling system: max. 40 detectors (internal and external skin together)

- Datalogger: max. 20 datalogger channels
- Logic gates: max. 80 gates with up to 8 inputs and one output each
- Timers: max. 40
- Limiting value modules: max. 40
- Demultiplexer "1 to 2" and "1 to 4": max. of 7 each
- Timer: max 64 switching channels with a total of 128 switching times
- Scenes: max. of 24 scenes, max. of 32 scene functions
- Presence simulation: max. 8 simulations, max. 32 functions (15 functions per simulation)
- Fault messages: max. 50
- Event e-mails: max. 50
- Video messages: max. 8

i During commissioning, configured icons, images and audio files are transferred to the device in the original file size and stored in the device RAM. To avoid having to commit large amounts of storage resources for these elements, the size of the icons and images should be adapted to the display size of the screen in the display elements. In addition, audio files (e.g. acoustic signal of fault messages or text displays) should only contain content with a short playback length.

### 4.2.4.2 Configuration software

#### 4.2.4.2.1 Introduction, installation and program start

**Introduction**

The Control KNX 9 is configured using the "Gira Control KNX Configuration Tool" and commissioned. This configuration software is installed independent of the ETS and allows the graphic configuration of display and operating elements and the configuration of the communication objects and function parameters to be simple and clear.
An ETS product database that has an embedded plug-in is available for calibrating the configuration data of the ETS project (group addresses, visible communication objects). The data exchange between configuration software and ETS PlugIn takes place via an internal interface (IP via local host).

**Installation and program start**

The configuration software is an executable EXE program that must be installed on the PC before using for the first time. For this reason, the program is supplied as installation package. Executing the installation package opens the Setup program, which provides an easy guide through the installation process and installs the configuration software correctly on the PC.

The configuration software can be run on PCs with the operating systems Windows® XP SP3 (only 32-bit), Vista SP2, and 7 SP1 (32 and 64-bit respectively).
CPU > 2 GHz
RAM > 2 GB
Screen resolution: at least 1024 x 768
To obtain the best results, we strongly recommend using at least 4 GB RAM and a higher screen resolution!

The configuration software can be opened after a successful installation operation. Opening is possible - depending on the options selected or possible during installation - either by double-clicking the program icon on the desktop or, alternatively, via the Start menu or the Quick Start bar of the operating system.

After starting the configuration software, a new project is first opened. This project can be used as the basis for a new configuration if no project file is yet available.
In the configuration software, a project file can be created or opened and saved in the "File" menu. A separate project file is required for each individual configuration of a device. For this reason, when assigning a name to the project file (file ending: "*.gpct9"), a meaningful name should be selected to identify the configured device (e.g. "living room panel.gpct9"). The filename is assigned on saving.

#### 4.2.4.2.2 Structure and operation

**Structure**

The program interface is subdivided into different areas (Figure 8), in which the configuration of the device can be structured. Structure trees in the project bar (A) and in the structure view (B) make it easier to navigate through the functions, device settings and display pages. Display pages can be set up quickly and customer-friendly as well as freely according to individual criteria by using a template library with building structures and KNX functions in the templates bar (C). A large work area (D) allows the set configuration to be previewed and simulated. Parameters of functions or graphic display elements are available clearly in property lists (E) or on special display pages in the work area. All program functions (file operations, ETS synchronisation, commissioning) can be retrieved and executed via the menu bar (F). Many configuration processes - for example, the creation of new rooms and KNX functions - can be executed with the mouse by drag & drop.

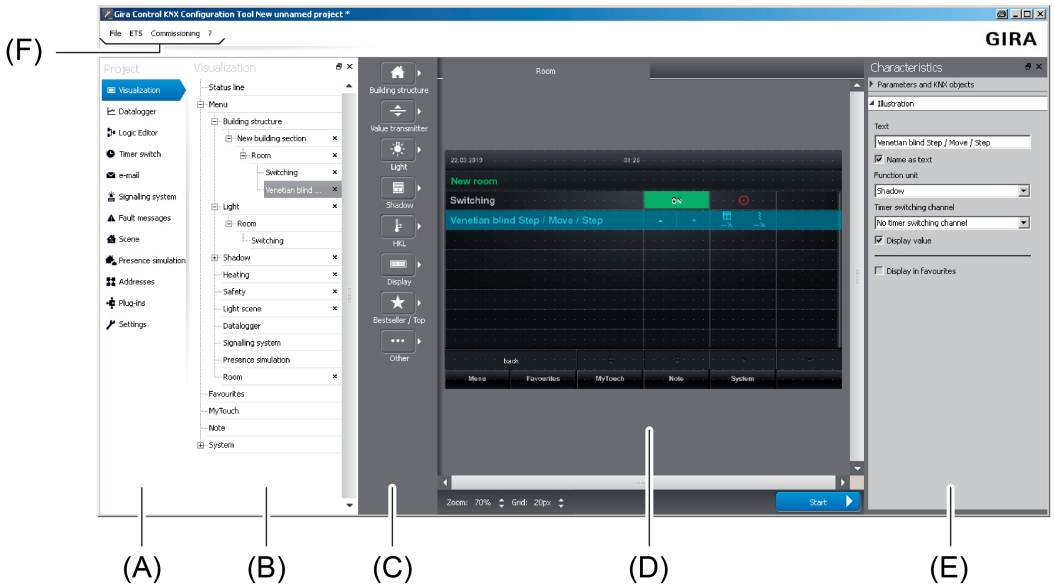


Figure 8: Structure of the program interface (standard structure)

(A) Project bar
(B) Structure view (position modifiable)
(C) Templates bar
(D) Work area
(E) Characteristics bar (position modifiable)
(F) Menu bar

The areas of the program interface perform the following tasks...

- Project bar (A):
  The configuration of the device is accessed and the visible project area defined via the project bar. What you select here determines which project contents are displayed in other areas of the program. The configuration of all operating and display information of the graphic user interface is possible via the "Visualization" node. The device settings are available via the "Settings" node. The internal and external KNX group addresses are created and managed via the "Addresses" node.
  The project bar is always fixed to the left edge of the program window.

- Structure view (B):
  The structure of the configuration is shown in the structure view. Depending on the selection in the project bar, it is possible to navigate through all available project settings or function elements here. In the project area of the visualization, the project structure of the available display pages, for example, is displayed in the structure view (building and function unit pages, system pages). Therefore, rooms, function units and KNX functions are created and configured here. In other project areas, a systematic overview of settings or function elements is possible by means of the structure view (e.g. timer channels of the timer or configured fault messages).
  The structure view in the standard view is arranged next to the project bar to the right. It can be detached from the program window and positioned anywhere on the PC screen or on another place in the window if required. Optionally, the structure view of the selected program area can be closed ("X" in the header) so that it is hidden. A structure view can be restored if the entry of the structure view in the menu line (F) is selected again by clicking with the right mouse button.
  Not all the nodes in the project bar require a structure view. The structure view is only available for project areas that require the systematic overview of settings or navigation through configuration elements.
- Templates bar (C):
  In the templates bar, which is only visible in the project area of the visualization, is the templates library for the configuration of the desired building and function unit structure and KNX functions. The templates for the project structure are assigned by drag & drop: Elements of the templates library are assigned to the structure view or directly to the designated positions in the work area (see page 48).
- Work area (D):
  The work area displays various types of information depending on which project area was selected via the project bar.
  The work area is used as a preview of the configured graphic user interface in the project area of the visualization. It displays the corresponding display pages of the elements selected in the structure view. In this way, the appearance of the control surfaces (buttons, rockers, value sliders), display areas (status texts and status symbols) and navigation elements can be visualized page by page and adjusted accordingly to the requirements. The rooms, function units, KNX functions and function pages visible in the display area are selected by mouse click whereby the characteristics of the selected elements are displayed directly in the other program areas (D), (E). In this way, quick and easy navigation is possible through the building structure, display and operating functions and settings during the configuration.
  In the display area of the visualization a simulation of the graphic user interface can be executed. This makes it possible to already test and visualize all operating and display functions during the configuration including real navigation through the display pages. The user interface in the simulation can be used in a similar way as on the device after commissioning. Unlike local control, however, no KNX telegrams can be transmitted or evaluated. Even some functions whose statuses are controlled by bus telegrams (e.g. the signalling system or fault messages) can only be operated to a limited extent in the simulation. The simulation is started by pressing the control surface "Start" in the footer of the work area. The simulation is stopped at the current position by clicking the mouse button on the control surface "Stop". All other program areas of the configuration software are hidden during a simulation.
  In other project areas, the work area displays parameters for functions or function elements (e.g. timer channels of the timer or configured fault messages).
  The work area is always arranged in the centre of the program window. Its size varies depending on the visibility of other program areas. The display area fills the entire program window in the simulation.

- Characteristics bar (E):
  The characteristics bar, which is only visible in the project area of the visualization, contains all parameters and communication objects for display pages and operating and display elements of the graphic user interface. The characteristics bar displays all parameters and objects for the selected element depending on the selection in the structure view or in the work area.
  The characteristics bar is subdivided into two areas. The first area always contains all KNX objects and normally parameters that define communication characteristics (e.g. parameters for defining data formats and operating times, password protection settings of display pages). The second area contains parameters that influence the representation of the display and operating elements (e.g. name of display pages, image texts, symbol definitions, assignments to function units, value formats).
  The characteristics bar in the default view is arranged on the right edge of the program window. It can be detached from the program window and positioned anywhere on the PC screen or on another place in the window if required. Optionally, the characteristics bar can be closed ("X" in the header) so that it is hidden. The bar can be restored if the entry of the characteristics in the menu line (F) is selected again by clicking with the right mouse button.
- Menu bar (F):
  All program functions can be retrieved and executed via the menu bar. This includes file operations, the ETS synchronisation as well as the commissioning by data exchange or IP communication.

**Operation**

The configuration software has been designed so that many configuration processes can be executed with the mouse by drag & drop. Particularly the configuration of the visualization - for example the creation of new rooms and KNX functions - is carried out in this simple way. Parameters for the different device functions are set similarly to the ETS for the most part: Parameters - depending on the functions to be configured - are either available in list form in the work area or in the area of the settings and divided into categories depending on the functions.

Configuration of the Visualization

In the templates bar, which is only visible in the project area of the visualization, is the templates library for the configuration of the desired building and function unit structure and KNX functions. The templates for the project structure are assigned by drag & drop: Elements of the templates library are assigned to the structure view or directly to the designated positions in the work area. The following images show by way of example the creation of a new room and KNX function "Switching" in the standard function unit "Light".

i The example shows the creation of a new building structure and KNX function into the structure view by drag & drop. Alternatively, these elements can also be inserted into the graphic user interface by drag & drop in the work area.

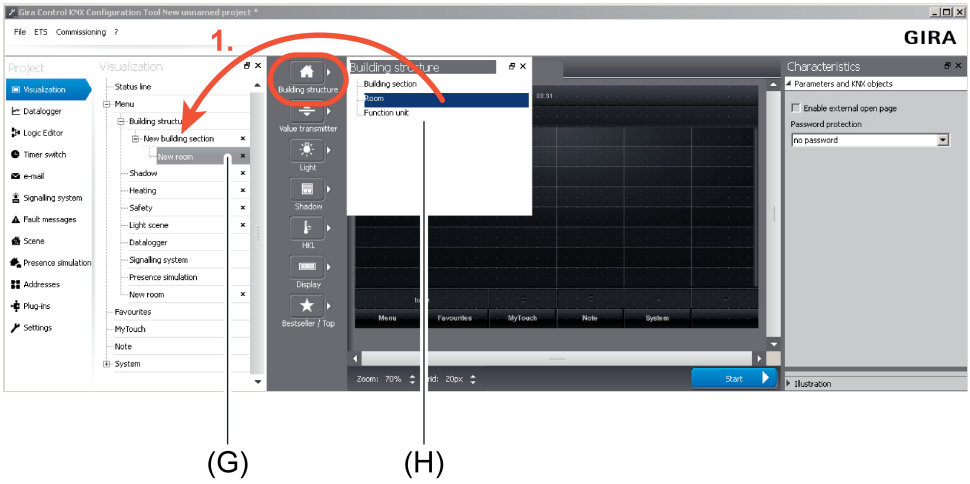


Figure 9: Creation of the building structure (here: insertion of a room)

(G) New room
(H) Template for building structure

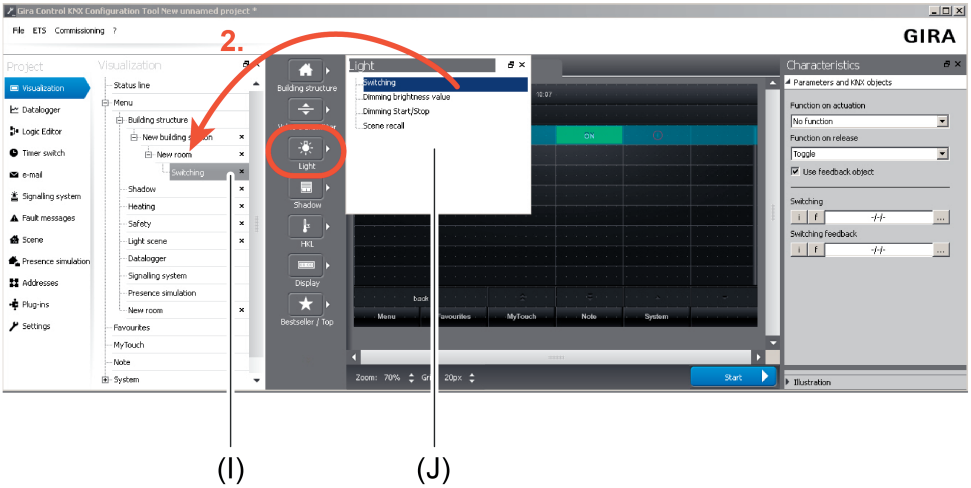


Figure 10: Creation of a KNX function (here: insertion of a function "Switching")

(I) New KNX function in a room
(J) Template for KNX functions in standard function unit "Light"

Configuration of the KNX group addresses

Communication objects of the device can only transmit telegrams to the KNX if they have been linked with external KNX group addresses. Furthermore, internal group addresses can be used to link functions of the device together. This is advisable, for instance, if these functions exchange data values or switching states among each other but do not have to transmit telegrams directly to the KNX (e.g. internal linking of logic functions).
The configuration software makes it possible to create and link internal as well as external group addresses. The group addresses can be managed synchronously for an ETS project or independent of that. Normally, an ETS synchronous management of the group addresses is preferable since the device configured with the aid of the configuration software is integrated into a KNX installation and thus in an environment with different group addresses of various tasks and data formats. An ETS product database that has an embedded plug-in is available for calibrating the configuration data of the ETS project (group addresses, visible communication objects). Group addresses and communication objects can be exchanged between an ETS

project and a project of the configuration software with the aid of the plug-in. In this way, it easily possible to load the existing group addresses in an ETS project into the device configuration and to use them there.
It is often advisable during the development phase of a project to create new external as well as internal group addresses independent of the ETS. This is possible in the configuration software by selecting the entry "Addresses". Here, all group addresses synchronised with the ETS are displayed as well. Internal and external addresses are identified differently. Internal address are identified by an "i", and external addresses by an "e". This identification is also necessary when creating new addresses in order to distinguish between internal and external addressing. For this purpose, an "i" or "e" must be prefixed when entering the address.
Communication objects can only be linked with group addresses that exist in the address list. A link to an object can be made by the link-editor, which every object has (button "..." next to the communication object).
Compatible group addresses are displayed in the link-editor for the data type.

i The configuration software can display and manage two or three-stage group address structures. The structure to be used must be configured in the device settings. The setting must match the setting for the group address structure of the relevant ETS project!
The ETS4 supports a free structure configuration of the group addresses. The configuration software as well as the plug-in cannot represent this free group address structure and always interpret the group addresses in the specified form (two or three-stage).

#### 4.2.4.2.3 Data comparison with ETS

**Introduction**

An ETS product database that has an embedded plug-in is available for calibrating the configuration data of the ETS project (group addresses, visible communication objects). Group addresses and communication objects can be exchanged between an ETS project and a project of the configuration software with the aid of the plug-in. In this way, it easily possible on one hand to load the group addresses available in an ETS project into the device configuration and to use it there. On the other hand, addresses that were created in the configuration software can be transferred to the ETS project by the synchronisation process.
The ETS-Synchronisation is able to detect conflicts with group addresses. Conflicts will then arise, for example, if group addresses in the configuration software are created independent of the ETS and are linked with objects, these addresses already use other data formats in the ETS projects, however.

Within the ETS (Project view), all configured objects of the device are each displayed independently with allocated group addresses after a data comparison depending on the data format. Dynamic objects of the visualisation are displayed independent of function, i.e. the objects are not identified with unique names. For predefined functions (e.g. signalling system or presence simulation) the affiliated objects are labelled dependent on function.
Group addresses may only be linked with communication objects in the configuration software!
The data management in the ETS project is only for maintaining the address table (specification of the data formats) and for generating filter tables for backbone/line couplers.

i The device is only commissioned by the configuration software. The ETS product database cannot be used to load the application program into the device. The plug-in prevents programming of the application data by the ETS.
The physical address of the device can also be programmed using the application program.

**Performing synchronisation**

Synchronisation by means of ETS must be performed in a defined order. The steps described below explain the procedure for performing a synchronisation of group addresses and communication objects with an ETS project.

A synchronisation should take place at the beginning of the device configuration when an ETS project with group addresses already exists. During the progress of a project design, it is advisable to perform a synchronisation with the ETS regularly in order to detect group address conflicts at an early stage or to reduce the configuration work as much as possible when creating new group addresses. After completing the device configuration in the configuration software, an ETS synchronisation should always be performed so that all objects and group addresses used are synchronised with the ETS project.

Synchronisation of the device configuration with the ETS requires that a device in the corresponding ETS project was inserted at the designated position of the topology by means of the product database. Ideally, a physical address should have been assigned to the device in the project and programmed.
The ETS and configuration software must be opened with the designated projects.

- Step 1: In the configuration software, recall the entry "Synchronise ETS -> ETS" in the menu.

  A program window will open displaying the standby mode of the ETS synchronisation.
- Step 2: Change to the ETS. In the ETS project, recall the parameter view of the device entry.

  The plug-in is started.
- Step 3: Click on the "Search configuration tool" button.

The plug-in attempts to establish communication with the configuration software. If the connecting process is successful, the plug-in identifies the configuration software, reads out the project design and displays in the left-hand list window the device name and device information of the project design found. If the ETS could already successfully synchronise the project design once, the device name of the selected project design will correspond to the name of the device in the ETS project. The device information then displays the physical address of the device that was configured at the time of the last synchronisation. If the project design has not yet been synchronised with the ETS, a standard device name is displayed and the device information indicates "new".
Next to the list window on the right, the plug-in displays more information in tabular form in the reading area regarding the project design read out and the device entry of the ETS project. By comparing this information it is possible to determine whether the correct project design was selected and when the last synchronisation took place.

i It is possible to activate several configuration tools in the ETS-Synchronisation. The plug-in always finds all the tools that are in synchronisation state. This is advisable, for instance, if there are different devices in a KNX installation that have to be synchronised in the ETS project with different device entries. In this case, a separate synchronisation process must be performed for each device entry in the ETS project.

i ETS and configuration software must always be on the same PC. The data exchange between ETS and configuration software takes place in the operating system via IP communication (local host / IPv4: 127.0.0.1). If a firewall is installed on the PC, it must be ensured that communication via local host is not prevented.

- Step 4: Once it is certain that the correct project design and device entry were selected in the ETS project, the synchronisation can be resumed. To do this, click on the project design to be synchronised in the left-hand list window and then click on the "Synchronise" button.

  The plug-in reads more details of the project design and displays them in a new window. In the left window area, the objects and group addresses read out from the device entry of the ETS project are displayed. In the middle area, the window displays the information read out from the project design.

- Step 5: Press the "Compare" button.

  The plug-in compares the project design read out from the configuration software with the ETS project. The comparison result is displayed in the left window area.
  If address conflicts (data formats that do not match each other) were detected, the plug-in highlights these conflicts in colour and displays a warning message. After confirming the warning message, it is possible to save the conflicts in text form by clicking on the "Save conflicts" button. The synchronisation process cannot then be executed until the end. All conflicts must first be removed manually by intervening in the project design. Only then can a new synchronisation process be resumed without interruption.

- Step 6: If no conflicts were detected in group addresses, the "Merge" button can be clicked on to resume the synchronisation.

  The plug-in then harmonises all objects and group addresses and updates the window area as a preview.

- Step 7: Finally, the harmonised project design can be applied in the ETS project and in the project design. To do this, the "Apply" button must be pressed.

  Objects of the project design are added to the ETS project. Group addresses are transferred from the ETS project to the project design and/or from the project design to the ETS project. The plug-in writes the device name, description and physical address from the ETS project as well as the ETS project name in the project of the configuration software so that identification is possible at the beginning of a new synchronisation process (see setup 3).
  The synchronisation is terminated after the transfer process has successfully run without any errors. In the configuration software, the standby mode of the ETS-Synchronisation is then terminated automatically. The plug-in can be closed.

If a synchronisation in the plug-in is cancelled before the end, this must also be cancelled manually in the configuration software before a new synchronisation can be executed. The reverse is true in like manner.

### 4.2.4.2.4 Commissioning

**Introduction**

Commissioning of the device is possible by IP programming connection via the Ethernet interface or alternatively via memory access (USB memory stick, SD card, network drive). When performing a commissioning, the configuration is transferred from the configuration software to a device. After successful transfer by IP or memory access, the target device re-starts automatically and thereby directly applies the new programmed configuration.

Besides the programming of a configuration, the readout is possible, too. A readout can be performed for the purpose of reconstruction, for example. Here, an IP connection to the device can be established, the existing configuration read out and transferred to the project of the configuration software. Alternatively, it is possible to read out an existing configuration in a device by memory access.

- To ensure that commissioning by an IP programming connection is possible, the device must be connected to a network via the Ethernet interface and the KNX application executed in the device. It is not necessary here to recall a specific display page.
- If a firewall is installed on the commissioning PC, this must enable the IP access for the configuration software. Otherwise, an IP programming connection to the device will not be possible. A firewall normally displays blocked programs when these programs are installed or started. Should this be the case when installing or starting the configuration software, be sure to adapt the configuration of the firewall without fail!
- During commissioning by means of IP, the existing devices are searched for in the first step. This broadcast search is performed by UDP (User Datagram Protocol) via port 13. The programming connection takes place in the next step by TCP/IP (Transmission Control Protocol / Internet Protocol) via IP port 8080.
- To ensure that a commissioning by an IP programming connection is possible, the IP settings in the Windows® operating system must be configured correctly on the device and on the commissioning PC. This includes the device's own IP address, the sub-network mask, the addresses of the standard gateway (e.g. Internet router) and a valid DNS server as well as settings for an optionally available firewall or proxy server.
  To change to the Windows® operating system on the device, the KNX application that should always be in the foreground in normal operation must be minimized or even terminated. It is possible to terminate the KNX application by briefly pressing the ON/OFF button. In doing so, the device changes to the operating system and displays the desktop. The KNX application can be minimized via the Windows taskbar. The Windows taskbar is normally in the background and is therefore not visible. The taskbar can be accessed by connecting a USB keyboard.

Commissioning and reconstruction by IP programming connection or memory access is described in the following sections.

**Commissioning by means of IP**

Commissioning by means of IP must be performed in a defined order. The steps described below explain the procedure for performing a commissioning by means of IP.

The configuration software must be opened with the designated project. The device must already be switched on and be ready for operation.

- Step 1: In the configuration software, recall the entry "Commissioning -> Transfer -> IP" in the menu.

  The configuration software first saves the current project. To do this, a file name must be specified if you have not already done so. The configuration software then searches in the network for available devices by means of IP broadcast. After the search procedure is completed, a window for device selection will open. In this window, devices can be identified using their name, physical address of the IP address and the MAC address.

- The device name displayed in the device selection corresponds to the computer name registered in the Windows® operating system. It can be suitably adapted directly on the device if required.
- Next to the device selection on the right is a button for updating the view. This allows a new IP broadcast device search procedure to be triggered.

- Step 2: In the device selection list, select the target device to be programmed by a simple mouse click. After that, click on the "Start" button. Alternatively, the list entry of the target device can be selected by a double mouse click.

  The configuration software establishes an IP programming connection to the device and prompts you to enter the password for commissioning by means of IP.
- Step 3: Enter the password for commissioning by means of IP.

  The configuration software loads the configuration into the target device. Afterwards, the device re-starts automatically and applies the programmed configuration. This completes the commissioning process.

- The configuration software allows the password to be entered incorrectly a maximum of three times. After entering the password incorrectly a fourth time, the configuration software will abort the commissioning operation.
- The password for the commissioning by means of IP is not defined in the configuration software. It is only saved in the device and must also be changed there. Passwords can be customized in the submenu "Settings". It is advisable to activate the password protection for the display page of the passwords so that the setting of new passwords is protected against unauthorised access. This is done by assigning the display page in the configuration software to a password level.

**Commissioning by means of memory access**

In the case of commissioning by means of memory access, the project data created in the configuration software and saved in a commissioning file must be imported to the device. This is possible directly on the device in the user and system settings.
Commissioning by means of memory access must be performed in a defined order. The steps described below explain the procedure for performing a commissioning by means of memory access.

The configuration software must be opened with the designated project.

- Step 1: In the configuration software, recall the entry "Commissioning -> Transfer -> File" in the menu.

  The configuration software first saves the current project. To do this, a file name must be specified if you have not already done so. Afterwards, the configuration software prompts for a file name and the storage location for the commissioning file. A commissioning file has the file ending "*.gdct9".
  The configuration file is created and saved at the predefined storage location.
- Step 2: On the device; go to the user and system settings and choose the menu item for importing a configuration (see page 122-123). Import the commissioning file saved previously.

  The device imports the commissioning. It then re-starts automatically. This completes the commissioning process.

**Reconstruction by means of IP**

A reconstruction by means of IP must be performed in a defined order. The steps described below explain the procedure for performing a reconstruction by means of IP.

The configuration software must be opened. The device must already be switched on and be ready for operation.

- Step 1: In the configuration software, recall the entry "Commissioning -> Reconstruction -> IP" in the menu.

  The configuration software searches in the network for available devices by means of IP broadcast. After the search procedure is completed, a window for device selection will open. In this window, devices can be identified using their name, physical address of the IP address and the MAC address.

i The device name displayed in the device selection corresponds to the computer name registered in the Windows® operating system. It can be suitably adapted directly on the device if required.

i Next to the device selection on the right is a button for updating the view. This allows a new IP broadcast device search procedure to be triggered.

- Step 2: In the device selection list, select the device to be reconstructed by a simple mouse click. After that, click on the "Start" button. Alternatively, the list entry of the device can be selected by a double mouse click.

  The configuration software establishes an IP connection to the device and prompts you to enter the password for commissioning by means of IP.

- Step 3: Enter the password for commissioning by means of IP.

  The configuration software reads out the configuration from the device. After the readout procedure is completed, the configuration software wants to transfer the readout configuration to its own project. This means that the previous configuration will be overwritten by the readout configuration. Consequently, the software will ask whether or not the opened project should be saved. After confirmation, the configuration software will load the readout configuration to its own project. The reconstruction process is thus completed.

i The configuration software allows the password to be entered incorrectly a maximum of three times. After entering the password incorrectly a fourth time, the configuration software will abort the commissioning operation.

i The password for the commissioning by means of IP is not defined in the configuration software. It is only saved in the device and must also be changed there. Passwords can be customized in the submenu "Settings". It is advisable to activate the password protection for the display page of the passwords so that the setting of new passwords is protected against unauthorised access. This is done by assigning the display page in the configuration software to a password level.

i During the reconstruction process, the device can be used normally.

**Reconstruction by means of memory access**

In the case of reconstruction by memory access, the project data exported by the device must be imported to the configuration software. The configuration that is active in the device can be exported directly on the device in the user and system settings.
A reconstruction by means of memory access must be performed in a defined order. The steps described below explain the procedure for performing a reconstruction by means of memory access.

The device must already be switched on and be ready for operation.

- Step 1: On the device go to the user and system settings and recall the menu item for exporting a configuration (see page 122-123). Export the configuration. The exported file has the file ending "*.gdct9".

- Step 2: In the configuration software, recall the entry "Commissioning -> Reconstruction -> File" in the menu. Specify the storage location of the project file to be imported and select the file.

  The configuration software reads out the configuration from the file. After the readout procedure is completed, the configuration software wants to transfer the readout configuration to its own project. This means that the previous configuration will be overwritten by the readout configuration. Consequently, the software will ask whether or not the opened project should be saved. After confirmation, the configuration software will load the readout configuration to its own project. The reconstruction process is thus completed.

### 4.2.4.3 Predefined display and operating functions

The device displays all KNX functions clearly and concisely. By touching it is possible to execute functions such as switching, dimming and Venetian blind control, to save and recall light scenes as well as visualize and evaluate complex functions such as value transmitter, date and limiting values. A clear and comprehensible menu navigation ensures fast access to the desired functions.

The use of predefined display pages available in the configuration software via a template library makes it possible to project design and commission the device in a uniform layout quickly and in a customer-friendly way.

#### 4.2.4.3.1 Display structure

**Main menu level, rooms and function units**

In order to make optimum use of the wide range of operating and display functions, the device has a clearly structured user interface. This ensures intuitive handling of the building control system. Operating and display functions (switching, dimming, blind, ...) can be subdivided into different rooms. The individual rooms are recalled via a room page in which the functions of each room can be controlled centrally and efficiently.
In addition, the operating and display functions are also allocated to function units (light, shading, heating, ...). Function units can be recalled via a function page in which room-independent and function-oriented control of the building functions is possible.
The control and display elements on the user interface are arranged in a standardized designed so that the display is identical on all display pages and operating steps are simplified considerably.

After starting the KNX application, the display first displays the main menu level. The main menu level contains the following menus as standard:

- Building structure
- Light
- Shadow
- Heating
- Safety
- Light scene
- Datalogger
- Signalling system
- Presence simulation

From the main menu level, the lower level menus can be accessed by touch operation (room control, function control, system settings).
Provided that no operation takes place anymore in the lower level menus, the display can return time-controlled to the main menu level. In the configuration software it is possible to configure after which time interval and to which page this return takes place. The return page should normally be the main menu level. Thus, the main menu level always characterises the basic display of the predefined view provided that the device was not operated for some time.

The main menu level
The main menu level has a defined display grid. If there are more symbols in the main menu level than can be displayed, the list can be switched by the sensor surfaces ▲ / ▼.

i The parameter "Start page" below the general settings defines the display page that is displayed automatically after a restart of the device. Ideally, this is - when using the predefined display pages - the main menu level.


Figure 11: Main menu level example

Building structure menu

In the building structure menu, the building structure created in the configuration software is displayed with all allocated building sections and rooms. Each existing operating and display function must be allocated to a room (area of operation). Functions can be operated and visualized room-oriented via the building structure menu. Each room has a sensor surface that can be touched. The room-oriented submenus are recalled by touching the sensor surface (Figure 12). The rooms are each identified in the sensor surface by the name that was entered individually in the configuration software (e.g. "living room", "kitchen" "study").


Figure 12: Building structure main menu example

If more rooms are configured than can be displayed, the room list can be switched by the sensor surfaces ▲ / ▼.
The building structure menu is always visible in the main menu level. Separate buttons for directly selecting the room can also be created there for each room created.

Light, shading, heating, security and light scene menu

Each KNX function can be allocated to a function unit. Five standard function units are predefined: "light", "shading", "heating", "security" and "light scene". All function units have their own menus that are visible in the main menu level. It is possible to create additional function units in the configuration software with freely definable names.

Furthermore, the device has additional functions which are independent of the five standard function units or of the user-defined function units that contain the KNX display and operating functions. These functions are partially on the main menu level or can be recalled via the submenu system in the footer of the screen.

The supplementary functions available in the main menu level include...

- the display page of the datalogger,
  for capturing and visualizing data that can be determined in the configuration software;
- the display page of the signalling system
  for displaying detector statuses and switching events;
- the display page of the presence simulation
  for the playback of a simulated presence.

The supplementary functions available in the submenu system in the footer of the screen include...

- the application settings,
  for editing light scenes, setting limiting values and recording and setting the presence simulation;
- the system settings,
  for setting date, time and brightness, displaying the software version and resetting to default settings;
- the user settings,
  for setting passwords, creating the e-mail account and commissioning;
- the display page of the fault messages,
  for displaying the history of the fault messages;
- starting the cleaning page,
  for cleaning the sensor surface; the touch sensitivity of the screen is switched off for 30 seconds for this purpose;
- the display page of the service addresses,
  for displaying the service address;
- and the display page of the history,
  for displaying previous system events.

The display page of the video messages can be opened via the submenu Note in the footer of the screen.


Figure 13: Submenu System

**Submenu - Rooms**

KNX functions, such as switching or dimming functions of a lighting system or control functions of a blind, are each allocated to a room. As a result, it is possible to control all functions of a room centrally and clearly. Each room created in the configuration software can be recalled via the submenu Rooms.
As soon as the page of the selected room is opened, all KNX functions allocated to the room will appear in the display. Each function has a sensor surface that can be touched in order to operate this function. The functions are each identified in the sensor surface by their name, which can be entered individually in the configuration software (e.g. "floor lamp", "ceiling luminaires", "Venetian blind left").

All configured functions are displayed. If more functions are allocated than can be displayed, the list can be switched by the sensor surfaces ▲ / ▼.

You can return to the main menu level by pressing the "back" button in the bottom left-hand corner of the screen or via the menu item "Menu".

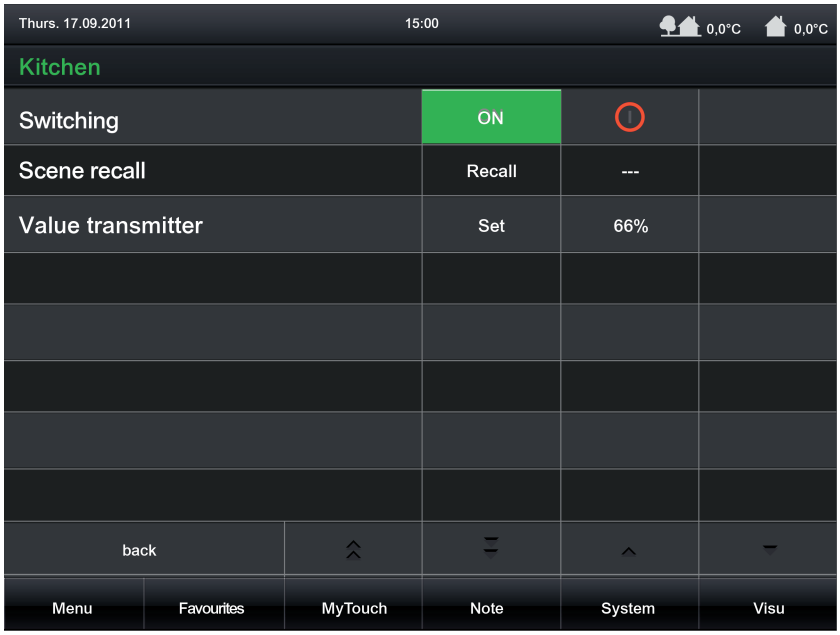


Figure 14: Example of functions in the room Kitchen

**Submenu - Function units**

All KNX functions created in the configuration software can be allocated to a function unit (light, shading, heating, security and light scene), in which room-independent and function-oriented control of the building functions is possible. The recall takes place via the main menu level. As soon as the submenu of a selected function unit is opened, all rooms that have functions allocated to the function unit appear in the display as well as the functions themselves.

All configured functions are displayed. If more functions are allocated than can be displayed, the list can be switched by the sensor surfaces ▲ / ▼.

You can return to the main menu level by pressing the "back" button in the bottom left-hand corner of the screen or via the menu item "Menu".

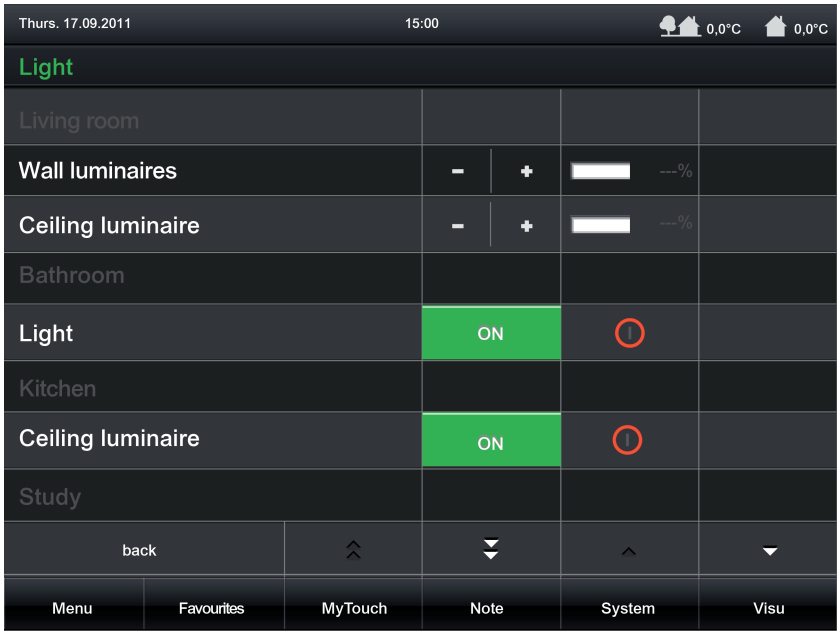


Figure 15: Example of submenu in the function unit Light

Each KNX function allocated to the function unit has a sensor surface that can be touched in order to operate this function. The functions are each identified in the sensor surface by their name, which can be entered individually in the configuration software (e.g. "floor lamp", "ceiling luminaires", "wall luminaires").
All functions are activated directly by touching the sensor surface.

**External open page and password protection**

Many pages can be opened for display by an external bus telegram. For this purpose, each of the display pages mentioned above optionally has its own 1-bit communication object. If the parameter "Enable external open page" is set, which is available separately for external display pages that can be opened, the object "external open page" becomes visible in the configuration software. As as soon as a "1"-telegram is received via this object during the running time of the device, the on-screen display switches over immediately to the corresponding display page. In this way, screen pages can be opened by other bus devices (e.g. by KNX presence detectors if a person is present in the room).

- The reception of a "0" telegram via the object "external open page" will show no response. The last telegram received defines which page is opened.
- As an alternative to the external open page, pages can also be displayed by an internal open page (defined jump to a configured page or page return). The operating function "Internal open page" is available for this purpose (see chapter 4.2.4.3.16. Operating function "Internal open page").

The opening of pages can optionally be protected by a password. Up to four password levels are available for this in the device. To activate the password protection, a password level must be assigned to a display page in the configuration software. The corresponding page will first then be displayed by an open page request (external or internal open page) if the correct password assigned to the level was entered. A keyboard is available on the screen for entering the password.
Provided that the user is within a password level when navigating through display pages, it is not necessary to enter the password each time the page changes. This first becomes necessary

when the user changes to a higher password level. When changing from a higher to a lower password level, it is not necessary to enter the corresponding password.
The activation of a password level after correctly entering the password remains active for approx. 40 seconds. After this time has elapsed, the password of a level must be entered again when changing a page.

- The display page of the signalling system and the commissioning by means of IP are protected by their own passwords.
- If an external open page is set, password protection is not possible for this page.
- See also (see page 120-121)

### 4.2.4.3.2 Operation concept and sensor evaluation

**Operation**

Operation is either direct operation or dialog operation.
Direct operation means that the control command is also executed simultaneously by touching the sensor surface. This operation concept is the same as the operation of a push-button sensor. This also allows central functions to be executed quickly and clearly (e.g. "All ON / All OFF", "room lighting ON / OFF").
In dialog operation, a dialog window in which further settings can be made and confirmed is opened by touching the corresponding sensor surface.

The controllable area of the display is subdivided into four areas. One column for the name and three columns with sensor areas that can vary depending on the function.
In the first column the function or its position is named. This area is used exclusively for display.
In the second column are the sensor surfaces for the direct operation of the function. In the function "Switching" on the touch display next to the name is a control field and display field, for example. The word "ON" in the control field designates the function that is executed by touching the sensor surface. After touching the control field, its display then changes to "OFF". The underlying function is therefore executed immediately by touching the sensor surface with your finger.
In the third column are the sensor surfaces for the dialog operation of the function, which are also the display area. In the function "Switching", for example, the display of the current switching state will appear here.
In the fourth column are the sensor surfaces for operating the timer.

In the example of the "blind positioning" function, the blind/shutter height and slat position can be specified separately from each other. Consequently, the sensor surfaces for the direct operation are split into two parts like a rocker switch (left and right), and in the display area in the third column are both symbols for the blind/shutter height and right slat position. With the sensor surfaces for direct operation, the blind/shutter height can be set directly by pressing the surfaces for a longer period of time. A dialog menu, in which the blind/shutter height and slat position can be set separately from each other, will open by touching the display area in the third column.

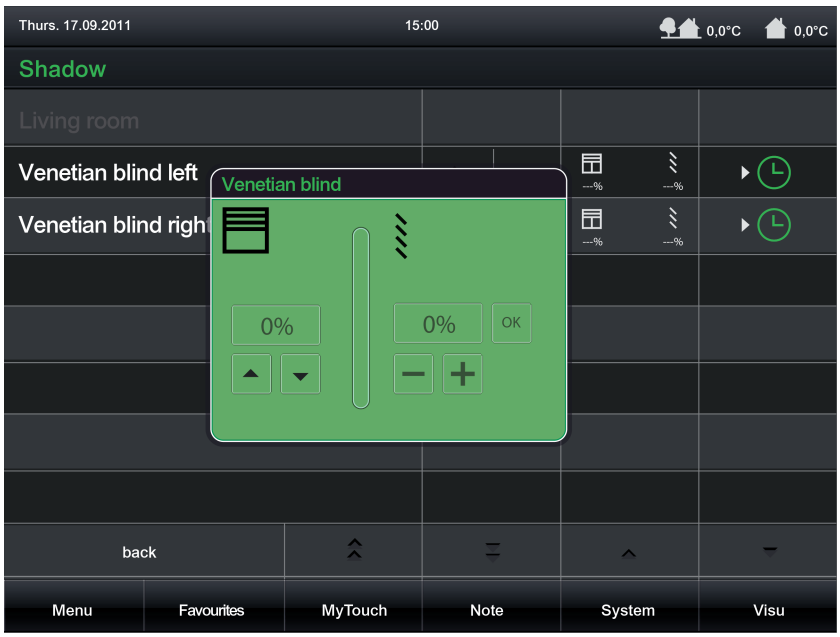


Figure 16: Example of dialog operation
(here: function " blind height" and "slat position")

i With some KNX functions (e.g. "Dimming brightness value" and "Venetian blind/shutter positioning") the brightness value or blind/slat position can be adjusted to the value transmitter levels by means of a long operation of the sensor surfaces left and right or top and bottom operation (rocker function). In the functions "Dimming brightness value", "Venetian blind positioning" and "Rolling shutter positioning", the value transmitter level is preset to 10 %. In the function "Value transmitter adjustment function", the value transmitter level can be defined in the configuration software.

**Sensor evaluation**

Operation - depending on the underlying function - is either direct operation or dialog operation. The following KNX functions take place by direct operation...

- Switching
- Dimming Start/Stop
- Venetian blind Step / Move / Step
- Rolling shutter Step / Move
- Scene request

The following functions can also take place by means of dialog operation...

- Dimming brightness value
- Blind positioning
- Rolling shutter positioning
- Value transmitter
- Operating mode switchover 4 x 1 bit
- Operating mode switchover KNX
- Restraint

In direct operation the operating element can be touched anywhere. The preset push-button function will then always be executed. In dialog operation the operating element is split into two sensor areas. These sensor areas are next to each other and must be operated separately from each other. It is not permissible to operate both sensor areas simultaneously.

i The sensor areas for controllable KNX functions are represented by icons indicating the command to be executed when touched. These operating icons are dependent on the configured function.

i Operating icons always indicate the two operational sensor areas (left / right). Consequently, two icons are then always visible. The visibility of the operating icons is dependent on the configured function and whether status elements are visible.

The commands transmitted to the bus during operation are predefined for some functions, for other functions the command can be configured in the configuration software.

The functions "KNX Date", "KNX Time", "Date / Time", "ASCII Text display" and "Collective feedback" are exclusively display functions. Consequently, these elements only display one status and cannot be operated.

i With the functions "Dimming brightness value", "Blind positioning" and "Rolling shutter positioning" the value can be adjusted to the value transmitter levels by means of a long operation of the sensor surfaces left and right. In the functions "Dimming brightness value", "Venetian blind positioning" and "Rolling shutter positioning", the value transmitter level is preset to 10 %. In the function "Value transmitter adjustment function", the value transmitter level can be defined in the configuration software.

- With the functions "dimming Start/Stop", "Venetian blind Step/Move/Step" and "rolling shutter Step / Move" a distinction is made between a short and long press of a sensor surface. This is necessary in order to distinguish between the commands for switching and dimming and for short and long time operation. The actuation times can be defined in the configuration software. With the functions "Dimming brightness value", "Venetian blind positioning" and "Rolling shutter positioning" the sensor surfaces can be pressed long for value adjustment.
- With the functions "Switching", "Value transmitter adjustment function", "Operating mode switchover 4 x 1-bit" and "Operating mode switchover KNX" it is possible to switch off the operating function completely. In this case, the KNX function concerned only works as a display function. Consequently, touching the display element does not induce any response.

#### 4.2.4.3.3 Operating and display function "Switching"

1-bit switching telegrams (ON, OFF, TOGGLE) can be transmitted to the bus by using the KNX function "Switching". In this way, it is possible to actuate lighting systems in combination with switch actuators. Furthermore, the switching telegram can also be used in another way for executing other control tasks in the KNX system that match the 1-bit data format.

A KNX function for switching has the area for the name (A), a sensor surface for direct operation (B) and a display area (C) in the graphic interface. The appearance and contents of these areas can be configured in the configuration software.

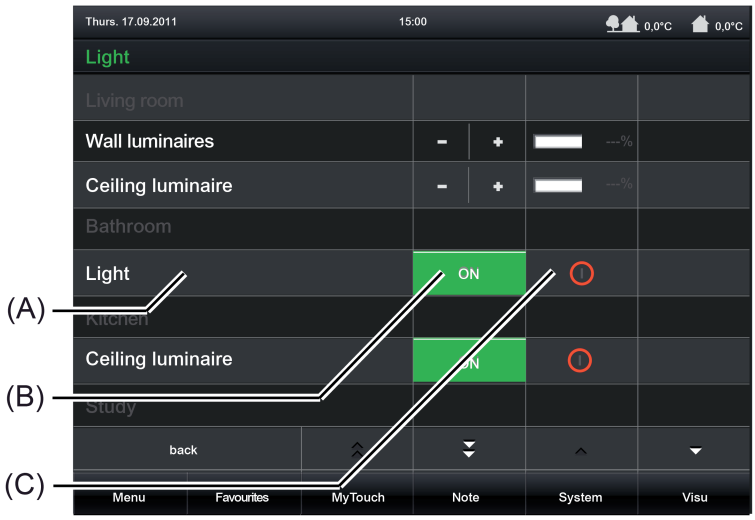


Figure 17: Example of operating and display elements of the function "Switching" here: Light in the bathroom and ceiling luminaire in the kitchen

**Status elements**

The display area contains different display elements (Figure 17) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). The sensor surface for direct operation (B) displays the switching state that should be produced by the next touch, depending on the configurations in the configuration software. Appropriate colour markings and the changing of display texts is possible. The display area (C) will contain different icons or texts depending on the object value of the switching status feedback ("0" / "1"). The display in the sensor surface and display area changes depending on the switching state thereby enabling the state of the controlled KNX function to be read clearly (e.g.: OFF or ON).

**Objects**

The function "Switching" has up to 2 KNX communication objects...

- "Switching" (1-bit transmitting and optional receiving):
  Switching telegrams are transmitted to the bus via this object after pressing the sensor element. This can cause a switching channel of a KNX switch actuator to be activated immediately, for example.
  If the parameter "Use feedback object" is not selected, the switching state received via this object also influences the status indications. This is advisable, for instance, if the activated KNX switch actuator does not have any separate feedback objects.

- "Switching feedback" (1-bit receiving):
  Through this object the device can receive a switching status feedback that a switch actuator transmits, for example. This influences the status text and status icon that can be displayed in the display area of the function element. The feedback of the switching status must be transmitted by the "actively transmitting" actuator.
  If the activated KNX switch actuator does not have a separate status feedback, the parameter "Use feedback object" can be deselected whereby the status indications are activated via the object "Switching".

#### 4.2.4.3.4 Operating and display function "dimming Start/Stop"

1-bit switching telegrams (ON, OFF) and 4-bit dimming telegrams (relative dimming: dimming up or dimming down by a dimming increment and stop telegram) can be transmitted to the bus by using the KNX function "dimming (Start/Stop)" . In this way, it is possible to actuate lighting systems in combination with dimmer actuators. Likewise, KNX speed controllers can be addressed whereby motors can be switched on and off and the speed changed.

A KNX function "Dimming Start / Stop" has the area for the name (A), a sensor surface for direct operation (B) and a display area (C) in the graphic interface. The appearance and contents of these areas can be configured in the configuration software. The sensor element distinguishes between short and long operations.
A short sensor operation triggers switching telegrams. Dimming telegrams are transmitted to the bus by means of long operations of the sensor surfaces. A stop telegram is triggered automatically by releasing a long pressed sensor element whereby a dimming process is stopped at the current brightness value.
The time for short and long operations can be adjusted in the configuration software.

i The relative dimming step width is unalterable (max. 100 %) in the function "Dimming Start / Stop". In this way, the entire brightness range of a lighting system can be controlled simply by a long button-press. The stop telegram when releasing is also predefined.

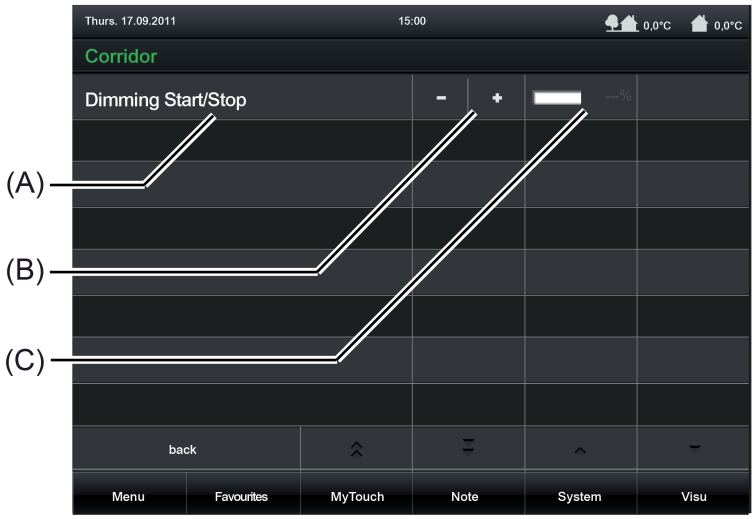


Figure 18: Example of operating and display elements of the function "Dimming (Start / Stop)"

**Status elements**

The display area contains different display elements (Figure 18) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). The sensor surface for direct operation (B) displays two buttons, **+** and **-** depending on the configurations in the configuration software, which trigger switching or dimming telegrams when they are touched . The display area (C) will contain brightness values as a bar graph and in plain text ("0...100 %") depending on the object value of the dimmer actuator feedback. After a device reset, the display shows "---%" until a feedback object value of the status text is received.

**Objects**

The KNX function "dimming (Start/Stop)" has up to 3 KNX communication objects...

- "Switching (1-bit transmitting):
  Switching telegrams are transmitted to the bus via this object after a short touch of the sensor element. A connected lighting system, for example, is switched on as a result. KNX dimmer actuators then normally set the configured switch-on brightness.

- "Dimming (Start/Stop)" (4-bit transmitting):
  Dimming telegrams are transmitted to the bus via this object after a long press of the sensor element. A connected lighting system is dimmed as a result. A stop telegram is triggered via this object by releasing the sensor element.

- "Dimming feedback brightness value" (1-byte receiving):
  Through this object the device can receive a brightness value feedback that a dimmer actuator transmits, for example. The status value, status icon and bar graph are influenced as a result. Consequently, the feedback object must always be configured properly so that the status indications of the channel element work correctly if these are visible. The feedback of the brightness value must be transmitted by the "actively transmitting" actuator. If the activated KNX dimmer actuator does not have a separate brightness value feedback, the parameter "Use feedback object" can be deselected whereby all the status indications are then no longer available either, however.

i The object "Dimming feedback brightness value" interprets received values on the basis of the KNX data point type 5.001 (Scaling). The decimal data values 0...255 are evaluated as percentages 0...100 % and displayed in the device display.

i Dimmer actuators normally transmit brightness values as feedback when the dimming processes have been completed, i.e. when dimmed or started brightness values have been set valid. For this reason, status indications of the channel element concerned do not normally change during a press of the sensor surface, but only when the buttons are released and the dimming processes are stopped. By contrast, a displayed status value can already change even during an operation if the dimmer actuator has set a minimum or maximum brightness or cannot pass through the entire brightness range due to disabling functions.
The feedback of a brightness value is returned with a delay after switching on or off based on the dimming speed set in the dimmer actuator. As a result, the status indications of the KNX function update themselves with a slight delay after releasing the sensor surfaces.

### 4.2.4.3.5 Operating and display function "Dimming brightness value"

1-byte brightness value telegrams (absolute dimming via 1-byte values in compliance with KNX DPT 5.001 scaling) can be transmitted to the bus by using the KNX function "Dimming brightness value". In this way, it is possible to actuate lighting systems in combination with dimmer actuators. Likewise, KNX speed controllers can be addressed whereby motors can be switched on and off and the speed changed.
The difference between the channel functions "Dimming Start/Stop" and "Dimming brightness value" is in the data formats of the communication objects.

A KNX function "Dimming brightness value" has the area for the name (A), a sensor surface for direct operation (B) and a display area (C) in the graphic interface, which is a sensor surface for dialog operation at the same time. The appearance and contents of these areas can be configured in the configuration software. The sensor element distinguishes between short and long operations.
A short sensor operation triggers value telegrams "100 %" or "0 %", depending on the operated sensor surface **+** or **-**. In this way, as with a switching operation, the activated load is switched on and off. Brightness value telegrams are transmitted to the bus gradually in a defined time interval by means of long operations of the sensor surfaces **+** or **-**. The device then increases or decreases the value cyclically during the operation by the specified value transmitter level of 10 % and transmits the values as a brightness setting. The value sequence generated in this way is converted to a dimming process by the activated dimmer actuator. The time between two value telegrams is set to 400 ms as standard, but can be changed in the configuration software. The time must be adjusted to the dimming speed of the dimmer actuator in order to attain a constant and interruption-free dimming process.
A dialog window (D) for dialog operation will open by touching the sensor surface. The dimming value can be set here with the existing operating elements. An input field for numbers is opened by touching the displayed %-value. The data entered in the dialog windows must be confirmed by touching the field "OK", which then closes the windows.

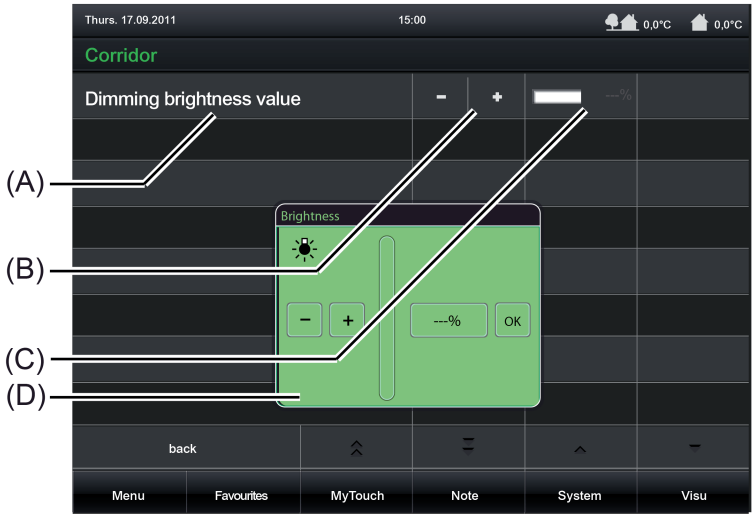


Figure 19: Example of operating and display elements of the function "Dimming brightness value"

#### Status elements

The display area contains different display elements (Figure 19) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). The sensor surface for direct operation (B) displays two buttons, **+** and **-** depending on the configurations in the configuration software, which trigger value telegrams "100%" or "0%" (after a brief touch) or brightness telegrams in gradual intervals (after a long touch) when they are touched. The display area (C), which is a sensor surface for dialog operation at the same time, will contain brightness values as a bar graph and in plain text ("0...100 %") depending on the object value of the dimmer actuator feedback. After a device reset, the display shows "---%"

until a feedback object value of the status text is received.
A dialog window (D) for dialog operation where the dimming value can be entered directly will open by touching the sensor surface.

**Objects**

The KNX function "Dimming brightness value" has up to 2 KNX communication objects...

- "Dimming brightness value" (1-byte transmitting and optional receiving):
  Value telegrams are transmitted to the bus via this object after pressing the sensor elements. This can cause a dimmer actuator to be activated.
  If the parameter "Use feedback object" is not selected, the brightness value received via this object also influences the status indications. This is advisable, for instance, if the activated KNX dimmer actuator does not have any separate brightness value feedback objects.

- "Dimming feedback brightness value" (1-byte receiving):
  Through this object the device can receive a brightness value feedback that a dimmer actuator transmits, for example. The status value, status icon and bar graph are influenced as a result. The feedback of the brightness value must be transmitted by the "actively transmitting" actuator.
  If the activated KNX dimmer actuator does not have a separate brightness value feedback, the parameter "Use feedback object" can be deselected whereby the status indications are activated via the object "Brightness object".

i The objects interpret values to be sent or received on the basis of the KNX data point type 5.001 (Scaling). The decimal data values 0...255 are evaluated as percentages 0...100 %.

i During an operation, the value of the object "Dimming feedback brightness value" is not evaluated. With a long press of the sensor elements **+** / **-** or when moving the slider, a continuous value adjustment can take place on the bus. During this value adjustment, all status elements of the channel element are updated continuously by value simulation. The display elements first react again to the feedback object value of the dimmer actuator after a short waiting time once the operation has been completed.

#### 4.2.4.3.6 Operating and display function "Venetian blind Step / Move / Step"

1-bit switching telegrams in compliance with the KNX data point types 1.007 (Step) and 1.008 (Up/Down) can be transmitted to the bus by using the KNX function "Venetian blind/shutter Step/Move/Step". In this way, it is possible to activate Venetian blinds (incl. slats) by means of short time and long time telegrams in combination with appropriate actuators. Similarly, other shading systems, such as roof windows, vertical slats and awnings can also be controlled by individual characteristics of the status indicators.

The sensor surfaces distinguish between short and long operations. Depending on this, different telegrams are transmitted to the bus...

- Immediately on pressing a sensor surface the device transmits a short time telegram to the bus (Figure 20), whereupon a running drive is stopped and the "time between short and long time operation" T1 is started internally. If the pressed sensor element is released again within T 1, the device transmits no further telegram. This short time serves the purpose of stopping a continuous movement.
  The "time between short and long time operation" is configured in the configuration software and should be selected shorter than the short time operation of the actuator to avoid any jerky movement of the activated drive.
- If the sensor element is kept depressed longer than T1, the device transmits a long time telegram after the end of T1 for starting up the drive and time T2 ("slat adjusting time") is started internally.
- If the sensor element is released again within the slat adjusting time, the device transmits another short time telegram. This function is used for adjusting the slats of a blind. The function permits stopping the slats in any position during their rotation.
  The "slat adjusting time" to be configured in the configuration software should be chosen as required by the drive for a complete rotation of the slats. If T2 is selected longer than the complete running time of the drive, a pushbutton function is possible as well. Here, the drive only remains on while the sensor element is kept depressed.
- If the sensor element is kept depressed longer than the "slat adjusting time", the device transmits no further telegram. The drive remains on until the end position is reached.

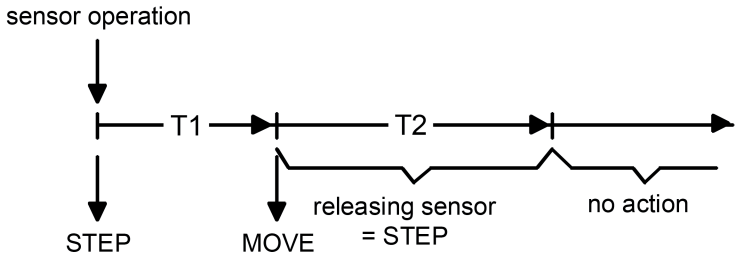


Figure 20: Telegram concept when a sensor surface of the channel function is touched "Venetian blind Step / Move / Step"

Short time and long time commands are transmitted in a similar manner to the bus during a sensor operation (shutter/blind control). The "slat adjusting time" of the KNX channel must be adjusted to the actual travelling time of the activated slat in order for a slat operation to be reasonably possible in the course of this!

A KNX function "Venetian blind Step / Move / Step" has the area for the name (A), a sensor surface for direct operation (B) and a display area (C) in the graphic interface. The appearance and contents of these areas can be configured in the configuration software.

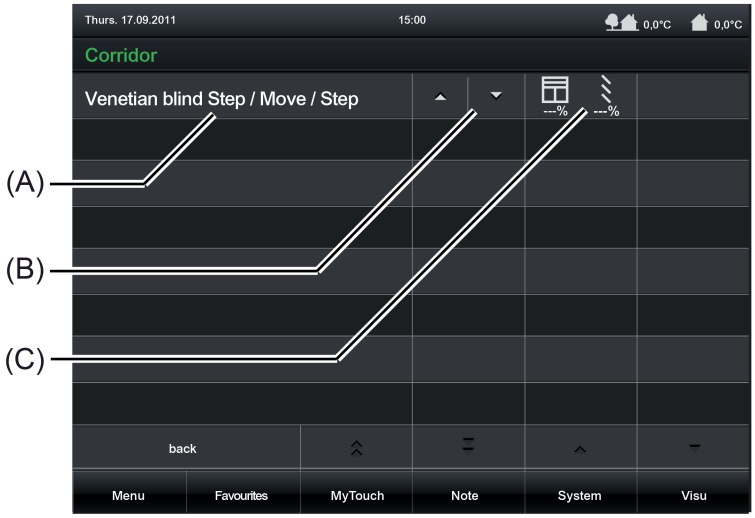


Figure 21: Example of operating and display elements of the function "Venetian blind Step / Move / Step"

**Status elements**

The display area contains different display elements (Figure 21) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). The sensor surface for direct operation (B) displays two buttons, **+** and **-** depending on the configurations in the configuration software, which trigger corresponding value telegrams after a brief or long touch. The display area (C) will contain position values for blind/shutter height and slat position in plain text ("0...100 %") depending on the object value of the venetian blind actuator feedback. After a device reset, the display shows "---%" until a feedback object value of the status text is received.

**Objects**

The KNX function "Venetian blind Step /Move/Step" has up to 4 KNX communication objects...

- "Short-time operation" (1-bit transmitting):
  Short time telegrams are transmitted to the bus via this object after a short touch of the sensor element. This causes any ongoing drive runs to be stopped. Alternatively, blinds/shutters or slats are activated briefly since the drive is being activated from the "Stop" state. KNX blind or shutter actuators then execute the configured short-time operation (Step).

- "Long-time operation" (1-bit transmitting):
  Long time telegrams (up, down) are transmitted to the bus via this object after a long press of the sensor element. This enables activated blinds/shutters of shading systems to be controlled until the end positions. KNX blind or shutter actuators additionally execute the configured long-time operation (Move).
  A short time telegram (see object "Short-time object") can interrupt ongoing drive runs of the long time operation (Stop) thereby enabling a blind/shutter to be stopped at any desired point.

- "Feedback blind/shutter position" (1-byte receiving):
  Through this object the device can receive a position feedback for the blind/shutter height that a shutter actuator transmits, for example. The status value, status icon and also the bar graph for the blind/shutter height visualisation are influenced as a result. The feedback of the position value must be transmitted by the "actively transmitting" actuator.
  If the activated KNX Venetian blind actuator does not have a feedback for the blind/shutter position, the parameter "Use feedback object" can be deselected whereby all the status indications are then no longer available either, however.

- "Slat position feedback" (1-byte receiving):
  Through this object the device can receive a position feedback for the slat position that a Venetian blind actuator transmits, for example. The status value for the slat visualisation is influenced as a result. The feedback of the position value must also be transmitted here by the "actively transmitting" actuator.
  If the activated KNX Venetian blind actuator does not have a feedback for the slat position, the parameter "Use feedback object" can be deselected whereby the status value indication is then no longer available either, however.

i The objects "Venetian blind position feedback" and "Slat position feedback" interpret values received on the basis of the KNX data point type 5.001 (Scaling). The decimal data values 0...255 are evaluated as percentages 0...100 % and displayed in the device display.

i Since Venetian blind or shutter actuators normally transmit position values as feedback, the activated motors stop when driver runs have been completed. For this reason, status indications of the function element concerned do not normally change during a press of the sensor surface, but only when the buttons are released and the drive runs are stopped. By contrast, a displayed status value can already change even during an operation if the drive is already in the end position or cannot pass through the entire position range due to disabling functions.

### 4.2.4.3.7 Operating and display function "Venetian blind positioning"

With the function "Venetian blind/positioning" it is possible to transmit 1-byte position telegrams (values in compliance with KNX DPT 5.001 Scaling) to the bus. In this way, it is possible to activate Venetian blinds (incl. slats) by means of position values in combination with shutter actuators. Similarly, other shading systems, such as roof windows, vertical slats and awnings can also be controlled by individual characteristics of the status indicators.
The difference between the functions "Venetian blind/shutter Step/Move/Step" and "Venetian positioning" lies in the data formats of the communication objects.

A KNX function "Blind positioning" has the area for the name (A), a sensor surface for direct operation (B) and a display area (C) in the graphic interface, which is a sensor surface for dialog operation at the same time. The appearance and contents of these areas can be configured in the configuration software. The sensor element distinguishes between short and long operations.
A short sensor operation triggers value telegrams "100 %" or "0 %" depending on the operated sensor surface ▲ or ▼, which affect the blind/shutter object. Position telegrams are transmitted to the bus gradually in a defined time interval by means of long operations of the ▲ or ▼ sensor surfaces. The device then increases or decreases the value cyclically during the operation by the specified value transmitter level of 10 % and transmits the values as a position setting. The value sequence generated in this way is converted to an adjustment operation by the activated venetian blind actuator. The time between two value telegrams is set to 400 ms as standard, but can be changed in the configuration software. The travelling time of the actuator channel must be adjusted to this time in order to attain a constant and interruption-free movement operation.
A dialog window for dialog operation will open by touching the sensor surface. The settings for the blind/shutter height and slat position can be made here with the existing operating elements. An input field for numbers is opened by touching the displayed %-value. The data entered in the dialog windows must be confirmed by touching the field "OK", which then closes the windows.

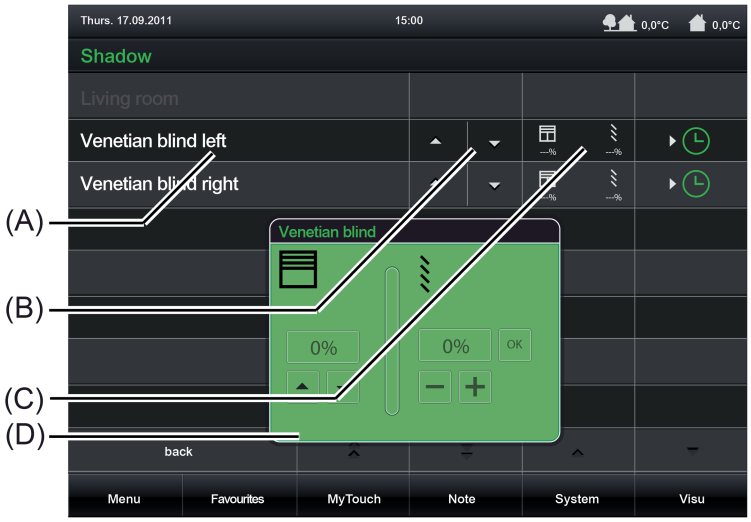


Figure 22: Example of operating and display elements of the function "Blind positioning"

#### Status elements

The display area contains different display elements (Figure 22) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). The sensor surface for direct operation (B) displays two buttons,  or  depending on the configurations in the configuration software, which trigger value telegrams "100%" or "0%" (after a brief touch/affecting the blind/shutter object) or position telegrams in gradual intervals (after a long touch) when they are touched. The display area (C), which is a sensor surface for dialog operation at the same time, will contain position values as a bar graph and in plain text ("0...100 %") depending on the object value of the venetian blind actuator feedback. After a device reset, the display shows "---%" until feedback object values of the status values are received or position values are specified.

A dialog window (D) for dialog operation where the position value can be entered directly will open by touching the sensor surface.

**Objects**

The KNX function "Venetian blind positioning" has up to 4 KNX communication objects...

- "Venetian blind position" (1-bit transmitting and optional receiving):
  Value telegrams for the blind/shutter height setting are transmitted to the bus via this object after pressing the sensor elements. This can cause a blind position object (e.g. "Position Venetian blind", "Position rolling shutter/awning", "Position venting louver"...) of a blind or shutter actuator to be activated.
  If the parameter "Use feedback object" is not selected, the position value received via this object also influences the status indications. This is advisable, for instance, if the activated KNX Venetian blind or shutter actuator does not have any separate feedback objects for the blind/shutter position.

- "Slat position" (1-bit transmitting and optional receiving):
  Value telegrams for the slat position setting are transmitted to the bus via this object after pressing the sensor elements. This can cause a slat position object of a shutter actuator to be activated.
  If the parameter "Use feedback object" is not selected, the position value received via this object also influences the status indications. This is advisable, for instance, if the activated KNX Venetian blind actuator does not have any separate feedback objects for the slat position.

- "Feedback blind/shutter position" (1-byte receiving):
  Through this object the device can receive a position feedback for the blind/shutter height that a shutter actuator transmits, for example. The status value as well as the bar graph for the blind/shutter height visualisation are influenced as a result. The feedback of the position value must be transmitted by the "actively transmitting" actuator.
  If the activated KNX Venetian blind or shutter actuator does not have a separate status feedback for the blind/shutter height, the parameter "Use feedback object" can be deselected whereby the blind/shutter status indications are activated via the object "Venetian blind position".

- "Slat position feedback" (1-byte receiving):
  Through this object the device can receive a position feedback for the slat position that a Venetian blind actuator transmits, for example. The status value as well as the bar graph for the slat visualisation are influenced as a result. The feedback of the position value must also be transmitted here by the "actively transmitting" actuator.
  If the activated KNX Venetian blind actuator does not have a separate status feedback for the slat position, the parameter "Use feedback object" can be deselected whereby the slat status indications are activated via the object "Slat position".

i The objects interpret values to be sent or received on the basis of the KNX data point type 5.001 (Scaling). The decimal data values 0...255 are evaluated as percentages 0...100 %.

During an operation, the values of the objects "Venetian blind position feedback" and "Slat position feedback" are not evaluated. With a long press of the sensor elements or a continuous value adjustment can take place on the bus. During this value adjustment, all status elements of the function element are updated continuously by value simulation. The display elements first react again to the feedback object value of the Venetian blind or shutter actuator after a short waiting time once the operation has been completed.

**Slat correction**

The KNX function of the "Venetian blind/ positioning" supports the supplementary function of the slat correction. Many KNX shutter actuators track the slat position when the shutter height changes due to a position setting. These actuators also reposition the slats when the blind position is preset to 0%, i.e. to the upper end position. This repositioning of the slats is often undesirable in the upper end position of the Venetian blind since the returned blind height also changes again due to the movement of the slats (position of blind unequal 0%). To prevent the slat from being repositioned in the upper blind end position, the automatic slat correction can be activated in the KNX function "Venetian blind/ positioning". It can be activated by parameter in the configuration software.
If the slat correction has been activated, the device always transmits a slat position of 0% for a blind height presetting of 0%. As a result, the slat is not repositioned when the upper end position is reached since this is already in the 0% position after the upward movement. It does not matter which operation performs the 0% presetting. Consequently, the slat correction will only function after short or long operations of the sensor surfaces or when changing the slider if a 0% blind position is set.
The automatic slat correction does not apply to position presettings for the blind within the range 1...100%. In such cases, the device only transmits slat positions when a slat operation is performed using the sensor surfaces or the slider.

#### 4.2.4.3.8 Operating and display function "Rolling shutter Step / Move"

1-bit switching telegrams in compliance with the KNX data point types 1.007 (Step) and 1.008 (UpDown) can be transmitted to the bus by using the KNX function "Rolling shutter Step / Move". In this way, it is possible to activate rolling shutters by means of short time and long time telegrams in combination with appropriate actuators. Similarly, other shading systems, such as roof windows, vertical slats and awnings can also be controlled by individual characteristics of the status indicators.
The difference between the KNX function "Venetian blind Step /Move/Step" basically lies in the fact that in order to simplify the control and display, no slat functions are available in the rolling shutter shading method, which is why the slat adjusting time, among other things, is omitted.

The sensor surfaces distinguish between short and long operations. Depending on this, different telegrams are transmitted to the bus...

- Immediately on pressing a sensor surface the device transmits a short time telegram to the bus (Figure 23), whereupon a running drive is stopped and the "time between short and long time operation" T1 is started internally. If the pressed sensor element is released again within T 1, the device transmits no further telegram. This short time serves the purpose of stopping a continuous movement.
  The "time between short and long time operation" is configured in the configuration software and should be selected shorter than the short time operation of the actuator to avoid any jerky movement of the activated drive.
- If the sensor element is kept depressed longer than T1, the device transmits a long time telegram after the end of T1 for starting up the drive.
- On releasing the sensor element, no further reaction takes place. The drive remains on until the end position is reached.

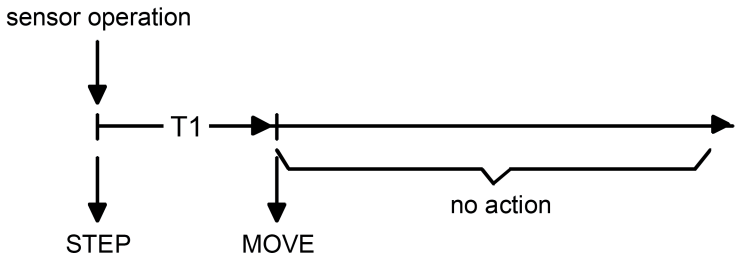


Figure 23: Telegram concept when a sensor surface of the channel function is touched "Rolling shutter Step/Move"

A KNX function "Rolling shutter Step/Move" has the area for the name (A), a sensor surface for direct operation (B) and a display area (C) in the graphic interface. The appearance and contents of these areas can be configured in the configuration software.

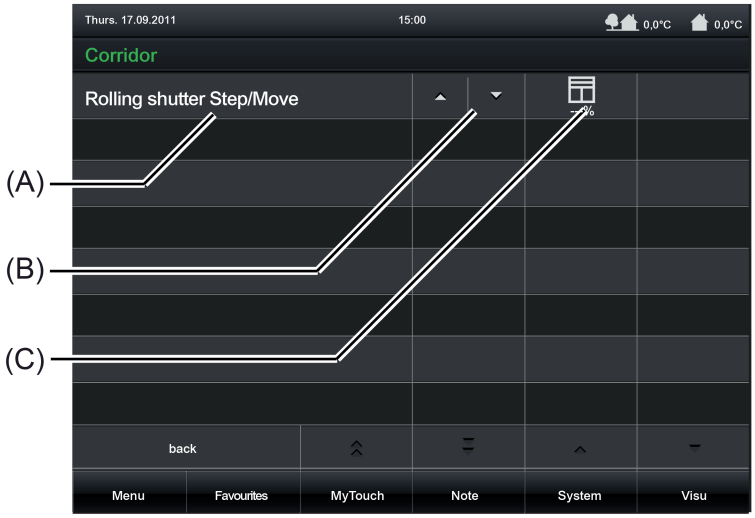


Figure 24: Example of operating and display elements of the function "Rolling shutter Step/Move"

**Status elements**

The display area contains different display elements (Figure 24) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). The sensor surface for direct operation (B) displays two buttons,  or  depending on the configurations in the configuration software, which trigger corresponding value telegrams after a brief or long touch. The display area (C) will contain position values in plain text ("0...100 %") depending on the object value of the venetian blind actuator feedback. After a device reset, the display shows "---%" until a feedback object value of the status text is received.
The displayed icon can be defined in the configuration software whereby an adjustment to the type of hanging (Venetian blind, awning, vertical slat, roof window) is possible.

**Objects**

The KNX function "Rolling shutter Step/Move" has up to 3 KNX communication objects...

- "Short-time operation" (1-bit transmitting):
  Short time telegrams are transmitted to the bus via this object after a short touch of the sensor element. This causes any ongoing drive runs to be stopped. Alternatively, blinds/shutters or slats are activated briefly if the drive is being activated from the "Stop" state. KNX blind or shutter actuators then execute the configured short-time operation (Step).

- "Long-time operation" (1-bit transmitting):
  Long time telegrams (up, down) are transmitted to the bus via this object after a long press of the sensor element. This enables activated blinds/shutters of shading systems to be controlled until the end positions. KNX blind or shutter actuators additionally execute the configured long-time operation (Move).
  A short time telegram (see object "Short-time object") can interrupt ongoing drive runs of the long time operation (Stop) thereby enabling a blind/shutter to be stopped at any desired point.

- "Feedback blind/shutter position" (1-byte receiving):
  Through this object the device can receive a position feedback for the blind/shutter height that a shutter actuator transmits, for example. The status value, status icon and also the bar graph for the blind/shutter height visualisation are influenced as a result. The feedback of the position value must be transmitted by the "actively transmitting" actuator.
  If the activated KNX Venetian blind or shutter actuator does not have a feedback for the blind/shutter position, the parameter "Use feedback object" can be deselected whereby all the status indications are then no longer available either, however.

i The object "Rolling shutter feedback" interprets received values on the basis of the KNX data point type 5.001 (Scaling). The decimal data values 0...255 are evaluated as percentages 0...100 % and displayed in the device display.

i Since Venetian blind or shutter actuators normally transmit position values as feedback, the activated motors stop when driver runs have been completed. For this reason, status indications of the function element concerned do not normally change during a press of the sensor surface, but only when the buttons are released and the drive runs are stopped. By contrast, a displayed status value can already change even during an operation if the drive is already in the end position or cannot pass through the entire position range due to disabling functions.

### 4.2.4.3.9 Operating and display function "Rolling shutter positioning"

With the function "rolling shutter positioning" it is possible to transmit 1-byte position telegrams (values in compliance with KNX DPT 5.001 Scaling) to the bus. In this way, it is possible to activate rolling shutters by means of position values in combination with Venetian blind or shutter actuators. Similarly, other shading systems, such as roof windows, vertical slats and awnings can also be controlled by individual characteristics of the status indicators.
The difference between the functions "Rolling shutter Step/Move" and "Rolling shutter positioning" lies in the data formats of the communication objects. In addition, the difference between the KNX function "Venetian blind positioning" basically lies in the fact that no slat functions for control and display are available in the rolling shutter shading method.

A KNX function "Rolling shutter positioning" has the area for the name (A), a sensor surface for direct operation (B) and a display area (C) in the graphic interface, which is a sensor surface for dialog operation at the same time. The appearance and contents of these areas can be configured in the configuration software. The sensor element distinguishes between short and long operations.
A short sensor operation triggers value telegrams "100 %" or "0 %" depending on the operated sensor surface ▲ or ▼. In this way, the activated blind/shutter can be moved to the end position. Position value telegrams are transmitted to the bus gradually in a defined time interval by means of long operations of the sensor surfaces. The device then increases or decreases the value cyclically during the operation depending on the specified value transmitter level of 10 % and transmits the values as a position setting. The value sequence generated in this way is converted to a movement by the activated Venetian blind or shutter actuator. The time between two value telegrams is preset to 400 ms. The travelling time of the actuator channel must be adjusted to this time in order to attain a constant and interruption-free movement operation.
A dialog window (D) for dialog operation will open by touching the sensor surface. The blind/shutter height can be set here with the existing operating elements. An input field for numbers is opened by touching the displayed %-value. The data entered in the dialog windows must be confirmed by touching the field "OK", which then closes the windows.

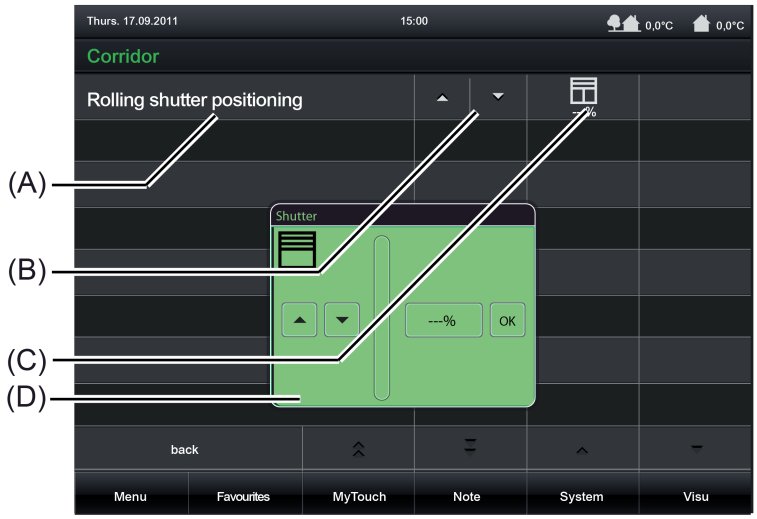


Figure 25: Example of operating and display elements of the function "Rolling shutter positioning"

#### Status elements

The display area contains different display elements (Figure 25) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). The sensor surface for direct operation (B) displays two buttons,  or  depending on the configurations in the configuration software, which trigger value telegrams "100%" or "0%" (after a brief touch) or position telegrams in gradual intervals (after a long touch) when they are

touched. The display area (C), which is a sensor surface for dialog operation at the same time, will display position values in plain text ("0...100 %") depending on the object value of the shutter actuator feedback. After a device reset, the display shows "---%" until feedback object values of the status values are received or position values are specified.
A dialog window (D) for dialog operation where the position value can be entered directly will open by touching the sensor surface.

**Objects**

The KNX function "Rolling shutter positioning" has up to 2 KNX communication objects...

- "blind/shutter position" (1-byte transmitting and optional receiving):
  Value telegrams for the blind/shutter height setting are transmitted to the bus via this object after pressing the sensor elements. This can cause a blind position object (e.g. "Position rolling shutter", "Position rolling shutter/awning", "Position venting louver"...) of a blind or shutter actuator to be activated.
  If the parameter "Use feedback object" is not selected, the position value received via this object also influences the status indications. This is advisable, for instance, if the activated KNX Venetian blind or shutter actuator does not have any separate feedback objects for the blind/shutter position.

- "Feedback blind/shutter position" (1-byte receiving):
  Through this object the device can receive a position feedback for the blind/shutter height that a shutter actuator transmits, for example. The status value, status icon and also the bar graph for the blind/shutter height visualisation are influenced as a result. The feedback of the position value must be transmitted by the "actively transmitting" actuator.
  If the activated KNX Venetian blind or shutter actuator does not have a separate status feedback for the blind/shutter height, the parameter "Use feedback object" can be deselected whereby the blind/shutter status indications are activated via the object "Rolling shutter position".

i The objects interpret values to be sent or received on the basis of the KNX data point type 5.001 (Scaling). The decimal data values 0...255 are evaluated as percentages 0...100 %.

i During an operation, the value of the object "Rolling shutter position feedback" is not evaluated. With a long press of the sensor elements / a continuous value adjustment can take place on the bus. During this value adjustment, all status elements of the function element are updated continuously by value simulation. The display elements first react again to the feedback object value of the Venetian blind or shutter actuator after a short waiting time once the operation has been completed.

#### 4.2.4.3.10 Operating and display function "Value transmitter"

With the KNX function "Value transmitter" telegrams in compliance with various KNX 1-byte, 2-byte and 4-byte data types can be transmitted to the bus. The activation of other bus devices enables the user with the 1-byte data formats, for example, to execute limiting value presettings or presettings for current counter statuses. With the 2-byte and 4-byte data formats it is possible to specify temperature or brightness values or to generate any preset values for other physical sizes with negative or positive signs.
Since the 1-byte data format is identical, it is also possible as an alternative or supplement to the KNX functions "Dimming brightness value" or "Venetian blind/rolling shutter positioning" to activate dimmer actuators more easily (via brightness value specification) or blind and shutter actuators (via position value specification). Here - as an example - static brightness or position values can be configured and recalled by sensor surface operation. Such an operation is appropriate when value adjustment by a long button-press or visualizations of slat positions are not required.

The function "value transmitter" has the area for the name (A), a sensor surface for direct operation (B) and a display area (C) in the graphic interface, which is a sensor surface for dialog operation at the same time. The appearance and contents of these areas can be configured in the configuration software.
A sensor operation triggers the value telegram defined in the configuration software (transmission value). The parameter "data point type" determines the data format of the value transmitter object. In addition, the "display format" can also be determined, which - depending on the set data point type - can also be characterised user-defined (gain and offset, value unit). The scaling of the status indications also adapts itself depending on this setting.

The table below shows the configurable data types and the resulting value ranges and possible value units specified...

| Data type | Display format | Value range | Value unit |
|---|---|---|---|
| 1-byte (5.001...5.004) | Percent (%) | 0...100 | % (specified) |
| 1-byte (5.001...5.004) | Degrees (°) | 0...360 | ° (specified) |
| 1-byte (5.001...5.004) | user-defined | 0...255 | user-defined |
| 1-byte (5.010) | user-defined | 0...255 | user-defined |
| 1-byte (6.010) | user-defined | -128...127 | user-defined |
| 2-byte (7.001) | user-defined | 0...65535 | user-defined |
| 2-byte (8.001) | user-defined | -32768...32767 | user-defined |
| 2-byte (9.001...9.021) | user-defined | -671089...670761 | user-defined |
| 4-byte (12.001) | user-defined | 0...4294967295 | user-defined |
| 4-byte (13.001) | user-defined | -2147483648...2147483647 | user-defined |
| 4-byte (14.000...14.079) | user-defined | -214748365...214748365 | user-defined |

Configurable data types, value ranges and value units

i The value transmitted via the communication object of the value transmitter can vary from the preset value during a sensor surface operation (presetting via transmission value in the configuration software or keyboard) because a gain factor and value offset can be configured optionally with some data types (see "Objects" below).

In addition to recalling values by operation of the sensor surface, it is possible to use a keyboard for presetting the value Kanalfunktion Wertgeber - 1 Byte (T-id=1207000459 L-id=1321248140 Link auf Ressource). Thus, it is optionally possible to permanently change the value that was originally preset in the configuration tool and thus to adapt it at any time.

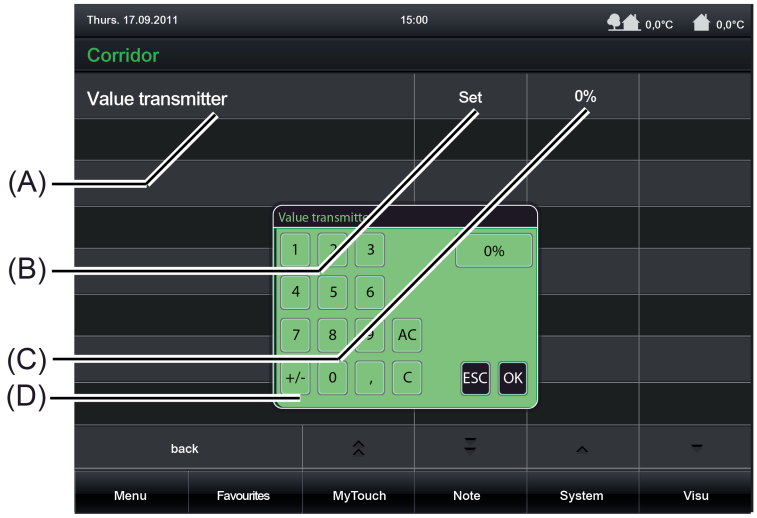


Figure 26: Example of operating and display elements of the function "value transmitter" with a data format "1-byte 5.001...5.004"

**Status elements**

The display area contains different display elements (Figure 26) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). The sensor surface for direct operation (B) displays a button with the name "Set" which will transmit a telegram corresponding to the set value when touched. The display area (C), which is a sensor surface for dialog operation at the same time, will contain the set setpoint in plain text. A dialog window (D) for dialog operation where the setpoint can be entered directly will open by touching the sensor surface.

**Objects**

The function "value transmitter" has 1 KNX communication object...

- "Value" (transmitting and optional receiving):
  Value telegrams are transmitted to the bus via this object after pressing the sensor element. This can cause, for example, a limiting value object, brightness value object or blind position object to be activated.

#### 4.2.4.3.11 Operating and display function "Value transmitter adjustment function"

With the KNX function "Value transmitter adjustment function" telegrams in compliance with various KNX 1-byte, 2-byte and 4-byte data types can be transmitted to the bus. The difference between the function "Value transmitter" (without adjustment function) lies in the fact that the value to be transmitted in the case of "Value transmitter adjustment function" can be adjusted continuously by a long button-press. The operation is comparable with the functions "Dimming brightness value" and "Venetian blind/rolling shutter positioning", the difference being that in the case of the value transmitter not just 1-byte data formats can be operated.

The function "value transmitter adjustment function" has the area for the name (A), a sensor surface for direct operation (B) and a display area (C) in the graphic interface, which is a sensor surface for dialog operation at the same time. The appearance and contents of these areas can be configured in the configuration software. The sensor element distinguishes between short and long operations.
The parameter "data point type" determines the data format of the value transmitter object. In addition, the "display format" can also be determined which - depending on the set data point type - can also be characterised user-defined (gain and offset, value unit). The scaling of the status indications also adapts itself depending on these settings. The parameter "Format" also makes it possible to adapt the amount of visible and adjustable digits before and after the decimal point (if present).

Every short operation of the sensor surfaces **+** or **-** triggers a value telegram in each case. Starting from the value of the last adjustment, the transmission value is increased or decreased by the configured "initial increment". An adjustment is possible until the range limits defined by the parameters "minimum value" and "maximum value".
Value telegrams are transmitted to the bus (value adjustment) gradually in a defined time interval by means of a long operation of the sensor surfaces **+** or **-**. The device then increases or decreases the value cyclically during the operation by the defined value transmitter levels and transmits the values to the bus. The initial increment can be configured by the parameter "initial increment". In the case of a value adjustment by a long button-press, the device first increases or decreases the value based on the initial increment. If the value adjustment lasts longer, the device increases the increment automatically so that the interval of the transmitted values becomes greater. Consequently, setpoints are reached faster.
The time between two value telegrams can be set. The time for short and long operations can also be adjusted in the configuration software.

The table below shows the configurable data types and the resulting value ranges and possible value units specified...

| Data type | Display format | Value range | Value unit |
|---|---|---|---|
| 1-byte (5.001...5.004) | Percent (%) | 0...100 | % (specified) |
| 1-byte (5.001...5.004) | Degrees (°) | 0...360 | ° (specified) |
| 1-byte (5.001...5.004) | user-defined | 0...255 | user-defined |
| 1-byte (5.010) | user-defined | 0...255 | user-defined |
| 1-byte (6.010) | user-defined | -128...127 | user-defined |
| 2-byte (7.001) | user-defined | 0...65535 | user-defined |
| 2-byte (8.001) | user-defined | -32768...32767 | user-defined |
| 2-byte (9.001...9.021) | user-defined | -671089...670761 | user-defined |
| 4-byte (12.001) | user-defined | 0...4294967295 | user-defined |
| 4-byte (13.001) | user-defined | -2147483648...2147483647 | user-defined |
| 4-byte (14.000...14.079) | user-defined | -214748365...214748365 | user-defined |

Configurable data types, value ranges and value units

The value transmitted via the communication object of the value transmitter can vary from the preset value during a sensor surface operation because a gain factor and value offset can be configured optionally with some data types (see "Objects" below).

In addition to recalling values by operation of the sensor surface, it is possible to use a keyboard for presetting the value Kanalfunktion Wertgeber Verstellfunktion - 1 Byte (T-id=1232581771 L-id=1321257356 Link auf Ressource). Thus, it is optionally possible to change the transmission value regardless of the value transmitter levels.

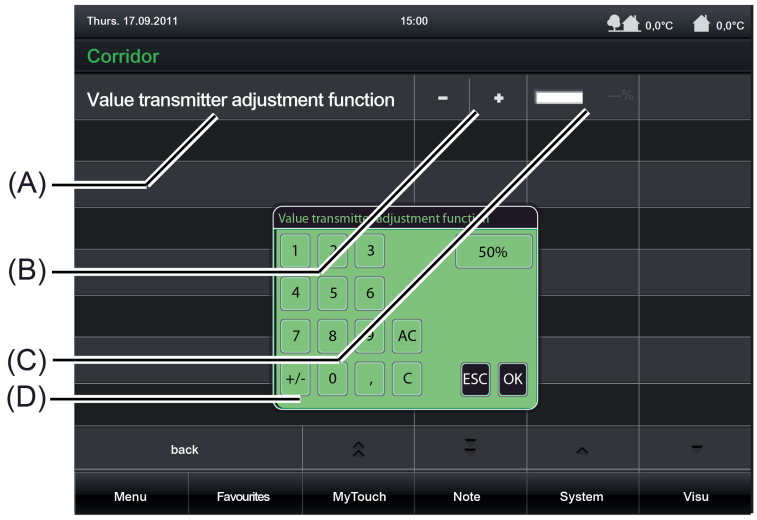


Figure 27: Example of operating and display elements of the function "value transmitter adjustment function" with a data format "1-byte 5.001...5.004"

**Status elements**

The display area contains different display elements (Figure 27) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). The sensor surface for direct operation (B) displays the sensor surfaces **+** or **-**, which will transmit a telegram corresponding to the set value when touched. The display area (C), which is a sensor surface for dialog operation at the same time, will contain a graphic setpoint display. A dialog window (D) for dialog operation where the setpoint can be entered directly will open by touching the sensor surface.

**Objects**

The KNX function "Value transmitter adjustment function" has up to 2 KNX communication objects...

- "Value" (transmitting and optional receiving):
  Value telegrams are transmitted to the bus via this object after pressing the sensor element. This can cause, for example, a limiting value object, brightness value object or blind position object to be activated.

- "Feedback value" (receiving):
  Through this object the device can receive a value feedback that an activated actuator transmits, for example. The status value for the value visualization is influenced as a result. The feedback of the value must be transmitted by the "actively transmitting" actuator.
  If the activated KNX actuator does not have a separate status feedback, the parameter "Use value feedback object" can be deselected whereby the status indications are activated via the object "Value".

i The status elements of the function are influenced by the objects "Value" or "Feedback value". In addition, a value recall by sensor operation or by entry via keyboard also influences the status elements. During a value recall, the status elements are updated according to the recalled value regardless of the current feedback value. The display elements first react again to the returned object value from the addressed device after a value recall by operation. As a result, this may cause a leap in value in the status indication when returned values vary from the preset value.

### 4.2.4.3.12 Operating and display function "Scene recall"

With the KNX function "Scene recall" it is possible to recall one of the scenes stored internally in the device. In this way, it is possible to control different KNX function units and thus, for example, to set lighting and shading systems in combination with the device's own scene function depending on the situation.
The function "Scene recall" is always executed as a direct operation. No distinction is made between short and long operations.

No telegram is transmitted to the bus via the operating and display function during the recall of an internal scene. Consequently, the function does not have its own communication objects. Only the internal scene function is activated.
The parameter "scene" specifies which of the internal scenes is to be recalled during an operation. In this parameter, a selection can first take place after at least one scene has been stored in the configuration software in the parameter branch "Scenes".

i It is not possible to change and save internal scenes via the function "Scene recall". For this purpose, the scene page is provided on the system page, where - if this was enabled in the configuration software - value or switching commands of a scene can be changed.

The function "Scene recall" has the area for the name (A), a sensor surface for direct operation (B) and a display area (C) in the graphic interface. The appearance and contents of these areas can be configured in the configuration software.

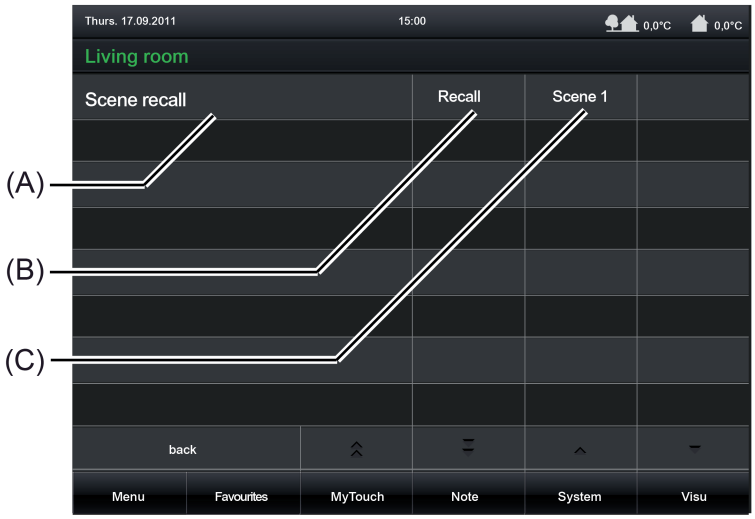


Figure 28: Example of operating and display elements of the function "Scene recall"

i With the function "Scene recall", it is possible to switch off the operating function completely in the configuration software. In this case, the function concerned only works as a display function for value visualization of the scene last recalled. Consequently, touching the sensor or display elements does not induce any response.

#### Status elements

The display area contains different display elements (Figure 28) that are influenced by parameters or by the scene configuration itself. A name can be assigned to each KNX function in the configuration software (A). The sensor surface for direct operation (B) displays the "Recall" button. After touching the sensor surface for direct operation, the display area (C) will contain the display of the selected scene (e.g. "Recall scene TV"). After a device reset, the status text shows "---" until an internal scene has been recalled.

**Objects**

No telegram is transmitted to the bus via the operating and display function during the recall of an internal scene using the function "Scene recall". Consequently, the function does not have its own communication objects. Only the internal scene function is activated.

### 4.2.4.3.13 Operating and display function "Operating mode switchover 4 x 1-bit"

With the KNX function "Operating mode switchover 4 x 1-bit " it is possible to activate a KNX room temperature controller that does not have 1-byte KNX objects for the operating mode switchover. The user can use this function to influence the control of a room temperature by presetting an operating mode.
The function "Operating mode switchover 4 x 1-bit" has the area for the name (A), a sensor surface for direct operation (B) and a display area (C) in the graphic interface, which is a sensor surface for dialog operation at the same time. The appearance and contents of these areas can be configured in the configuration software. The sensor element does not distinguish between short and long operations.

By touching the sensor surface for the dialog operation, the dialog window will open in which one of the possible operating modes (Comfort, Stand-by, Night reduction, Frost/heat protection) can be selected. In the configuration software it is possible to define which modes a user can select by a sensor surface operation. After confirming by touching the field "OK", you set the selected operating mode by touching the sensor surface for direct operation. The value set is then displayed in the display area.

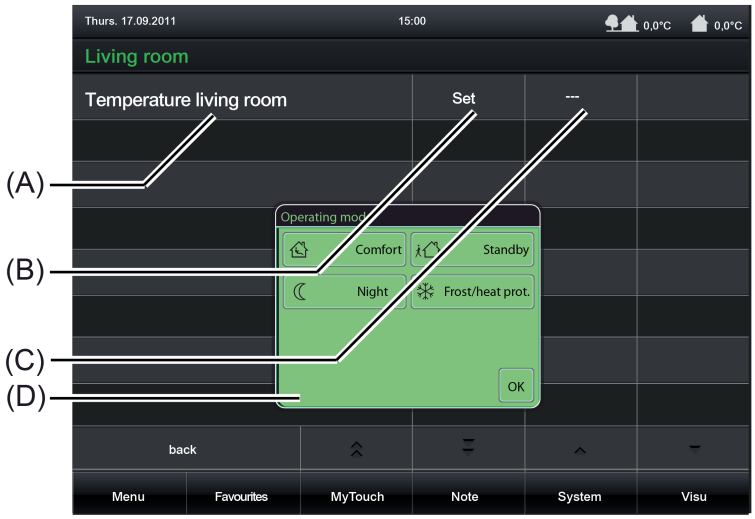


Figure 29: Example of operating and display elements of the function "Operating mode switchover 4 x 1-bit"

With the function "Operating mode switchover 4 x 1-bit", it is possible to switch off the operating function completely in the configuration software. In this case, the function concerned works solely as a display function for value visualization of the set controller operating mode. Consequently, touching the sensor element does not induce any response.

#### Status elements

The display area contains different display elements (Figure 29) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). The sensor surface for direct operation (B) displays the "Set" button. After touching the sensor surface for the dialog operation in the display area (C), the dialog window (D) will open in which one of the possible operating modes (Comfort, Stand-by , Night reduction , Frost/heat protection ) can be selected. After confirming the selection, the selected operating mode will also be displayed there in plain text. The displayed text can be configured separately for each operating mode in the configuration software (e.g. "Comfort"). After a device reset, the display shows "---" until a status object value of the status text is received or an operating mode is predefined.

The controller must return its status to the display element to enable a valid acceptance of the last specified controller operating mode to be displayed. This takes place via the object

"Feedback status" (see page 92-93). If the status feedback of the controller is not used (parameter "Use feedback object" is deselected), the display element automatically assumes after each presetting by the user that the operating mode last specified by the controller was also accepted as valid by the controller.

With the function "Operating mode switchover 4 x 1-bit", it is possible to switch off the operating function completely in the configuration software. In this case, the function concerned works solely as a display function for value visualization of the set controller operating mode. Consequently, touching the sensor element does not induce any response.

**Objects**

The KNX function "Operating mode switchover 4 x 1-bit" has up to 5 KNX communication objects...

- "Comfort mode" (1-bit transmitting and optional receiving):
  A "1"-telegram is transmitted to the bus via this object after pressing the sensor element when the comfort mode is activated. The object for the comfort mode of the room temperature controller is activated as a result.
  If the parameter "Use feedback object" is not selected, the object value received via this object also influences the status indications. This is advisable, for instance, if the activated KNX room temperature controller has a separate 1-byte status feedback object.

- "Standby" (1-bit transmitting and optional receiving):
  A "1"-telegram is transmitted to the bus via this object after pressing the sensor element when the standby operating mode is activated. The object for the standby operation of the room temperature controller is activated as a result.
  If the parameter "Use feedback object" is not selected, the object value received via this object also influences the status indications. This is advisable, for instance, if the activated KNX room temperature controller has a separate 1-byte status feedback object.

- "Night reduction" (1-bit transmitting and optional receiving):
  A "1"-telegram is transmitted to the bus via this object after pressing the sensor element when the night operating mode is activated. The object for the night operation of the room temperature controller is activated as a result.
  If the parameter "Use feedback object" is not selected, the object value received via this object also influences the status indications. This is advisable, for instance, if the activated KNX room temperature controller has a separate 1-byte status feedback object.

- "Frost/heat protection" (1-bit transmitting and optional receiving):
  A "1"-telegram is transmitted to the bus via this object after pressing the sensor element when the frost/heat protection mode is activated. The object for the frost/heat protection mode of the room temperature controller is activated as a result.
  If the parameter "Use feedback object" is not selected, the object value received via this object also influences the status indications. This is advisable, for instance, if the activated KNX room temperature controller has a separate 1-byte status feedback object.

- "Feedback status" (1-byte receiving):
  This object is only visible when the parameter "Use feedback object" is activated. Through this object the device can then receive a KNX compliant 1-byte status feedback of the activated KNX room temperature controller. This influences the status text and status icon that are displayed in the display area of the function element.
  If the activated KNX room temperature controller does not have a separate 1-byte status feedback, the parameter "Use feedback object" can be deselected whereby the status indications are activated via the four 1-bit objects. The display element evaluates the priorities of the four 1-bit objects automatically in this case and updates the status indications accordingly.

i With the function "Operating mode switchover 4 x 1-bit" it is always necessary to occupy the four 1-bit communication objects "Comfort mode", "Standby", "Night reduction" and "Frost/heat protection" with separate group addresses and link them to objects of the activated room temperature controller with the same function!
If the activated room temperature controller enables a KNX-compliant operating mode switchover via 1-byte KNX objects, the function "Operating mode switchover KNX" should be reverted to.

### 4.2.4.3.14 Operating and display function "Operating mode switchover KNX"

With the KNX function "Operating mode switchover KNX " it is possible to activate a KNX room temperature controller that has 1-byte KNX objects for operating mode switchover. The user can use this function to influence the control of a room temperature by presetting an operating mode.
The function "Operating mode switchover KNX" has the area for the name (A), a sensor surface for direct operation (B) and a display area (C) in the graphic interface, which is a sensor surface for dialog operation at the same time. The appearance and contents of these areas can be configured in the configuration software. The sensor element does not distinguish between short and long operations.

i If the activated room temperature controller does not have 1-byte KNX objects for switching over the operating mode, the function "Operating mode switchover 4 x 1-bit" must be used.

By touching the sensor surface for the dialog operation, the dialog window will open in which one of the possible operating modes (Comfort, Stand-by, Night reduction, Frost/heat protection, Automatic) can be selected. In the configuration software it is possible to define which modes a user can select by a sensor surface operation. After confirming by touching the field "OK", you set the selected operating mode by touching the sensor surface for direct operation. The value set is then displayed in the display area.

i The operating mode selected by the sensor surfaces is first accepted as valid by the internal controller and transmitted to the bus approx. 2 seconds after completion of the operation.

The KNX operating mode switchover can affect two objects on the room temperature controller. This will result in alternatively different functions...

- The KNX operating mode switchover affects the normal KNX object for the operating mode switchover on the controller (low priority):
  In this case, the sensor element can switch over the operating modes "Comfort", "Standby", "Night reduction" and "Frost/heat protection". This presetting of the operating mode is normally called "Automatic mode" in KNX controllers and can be overridden by other functions with a higher priority (e.g. window status, KNX forced - see below).
  The sensor element works according to this function if the parameter "Affects forced object" is deselected in the configuration software.

- The KNX operating mode switchover affects the KNX forced object for the operating mode switchover on the controller (high priority):
  In this case, the sensor element can switch over the Operating modes "Comfort", "Standby", "Night reduction" and "Frost/heat protection" by means of forced presetting. This presetting of the operating mode is normally called "Forced operation" in KNX controllers and cannot be overridden by other functions. In addition, it is possible to activate the automatic mode by an operation of the sensor surface. The forced presetting is then deactivated and the controller switches over to the operating mode that was set in normal operation.
  The sensor element works according to this function if the parameter "Affects forced object" is selected in the configuration software.

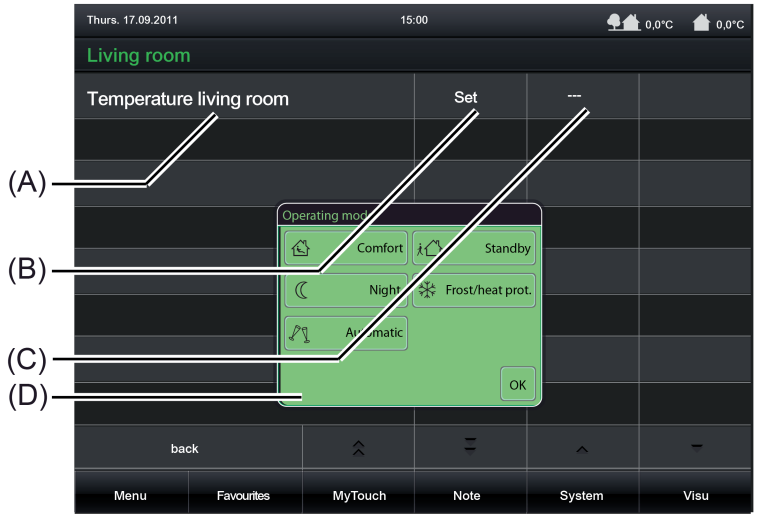


Figure 30: Example of operating and display elements of the function "Operating mode switchover KNX"

With the function "Operating mode switchover KNX" it is possible to switch off the operating function completely in the configuration software. In this case, the function concerned works solely as a display function for value visualization of the set controller operating mode. Consequently, touching the sensor element does not induce any response.

**Status elements**

The display area contains different display elements (Figure 30) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). The sensor surface for direct operation (B) displays the "Set" button. After touching the sensor surface for the dialog operation in the display area (C), the dialog window (D) will open in which one of the possible operating modes (Comfort, Stand-by, Night reduction , Frost/heat protection , Automatic ) can be selected. After confirming the selection, the selected operating mode will also be displayed there in plain text. The displayed text can be configured separately for each operating mode in the configuration software (e.g. "Comfort"). After a device reset, the display shows "---" until a status object value of the status text is received or an operating mode is predefined.
The controller must return its status to the display element to enable a valid acceptance of the last specified controller operating mode to be displayed. This takes place via the objects "Feedback status" and "Feedback forced". If the status feedback of the controller is not used (parameter "Use feedback object" is deselected), the display element automatically assumes after each presetting by the user that the operating mode last specified by the controller was also accepted as valid by the controller.

**Objects**

The KNX function "Operating mode switchover KNX" has up to 3 KNX communication objects...

- "Operating mode KNX" (1-byte transmitting and optional receiving):
  A value telegram according to KNX DPT "20.102" is transmitted to the bus via this object after pressing the sensor element. The operating mode of the activated room temperature controller is switched over as a result. Depending on the parameter "Affects forced object", either the normal KNX object for the operating mode switchover or the forced object of the controller is connected to this object.
  If the parameter "Use feedback object" is not selected, the object value received via this object also influences the status indications.
- "Feedback status" (1-byte receiving):
  This object is only visible when the parameter "Use feedback object" is activated. Through this object the device can then receive a KNX compliant 1-byte status feedback according to DPT "20.102" of the activated KNX room temperature controller. This influences the status text and status icon that are displayed in the display area of the function element.
  This object should only be used if the operating element affects a KNX forced object via the object "operating mode KNX". The object "Feedback status" should then be linked to the KNX object for normal operating mode switchover of the controller. Otherwise, this object remains unused. The feedback of the status must be transmitted by the room temperature controller "actively transmitting" (set transmission flag if necessary).
- "Feedback forced" (1-byte receiving):
  This object is only visible when the parameter "Use feedback object" is activated. Through this object the device can then receive a KNX compliant 1-byte status feedback of the restraint of the activated KNX room temperature controller. This influences the status text that could be displayed in the display area of the function element.
  This object should only be used if the operating element affects a KNX object for the operating mode switchover via the object "operating mode KNX". The object "Feedback forced" should then be linked to the KNX forced object of the controller. Otherwise, this object remains unused. The feedback of the forced status must be transmitted by the room temperature controller "actively transmitting" (set transmission flag if necessary).

i If the activated room temperature controller does not have 1-byte KNX objects for switching over the operating mode, the function "Operating mode switchover 4 x 1-bit" must be used.

#### 4.2.4.3.15 Operating and display function "Restraint"

With the KNX function "Restraint" it is possible to activate KNX actuators (normally these are switch actuators) at two different priority levels with just one operating element. By using this function the user can also define switching states independent of a normal operation in order to interlock the actuator channel in this way. Actuators that should be activated by the function "Restraint" must have a 1-bit communication object (normally "Switching") and 2-bit object (normally "Restraint"). The desired switching state ("1" or "0") is communicated to the actuator in normal operation via the 1-bit object. The actuator can be interlocked in a defined switching position via the forced object. The switching state is then predefined directly by the forced position telegram. The first bit (bit 0) of the forced object specifies the switching state to be forced. The second bit (bit 1) of the object activates or deactivates the forced-position state (see table below). The switching object is only evaluated in normal operation. The restraint is then inactive.

| Bit 1 | Bit 0 | Function |
|---|---|---|
| 0 | x | Deactivated |
| 1 | 0 | Restrained OFF |
| 1 | 1 | Restrained ON |

Coding of the 2-bit restraint

The function "Restraint" has a display element and the area for the name (A), a sensor surface for direct operation (B) and a display area (C) in the graphic interface, which is a sensor surface for dialog operation at the same time. The appearance and contents of these areas can be configured in the configuration software. The sensor element does not distinguish between short and long operations.

In the restraint "Deactivated" state, pressing the sensor surface for direct operation switches the object directly to the "OFF" or "ON" states. The necessary telegrams are transmitted to the bus via both communication objects of the function (see page 98) for this purpose. The display element in the sensor surface for direct operation displays the switching state that should be produced by the next touch, depending on the configurations in the configuration software. Appropriate colour markings and the changing of display texts is possible.
In the "Restrained ON" state the restraint is switched on, in the "Restrained OFF" state the restraint is switched off. The pressing of the sensor surface for direct operation is disabled in both cases. This is indicated by a darkened image of the sensor surface and a prohibit symbol that is inserted there. The display element in the sensor surface for direct operation also displays here the switching state that is not active.
It is only possible to toggle between the "Restrained ON" and "Restrained OFF" states via the dialog window (D) which opens by touching the "wrench symbol".

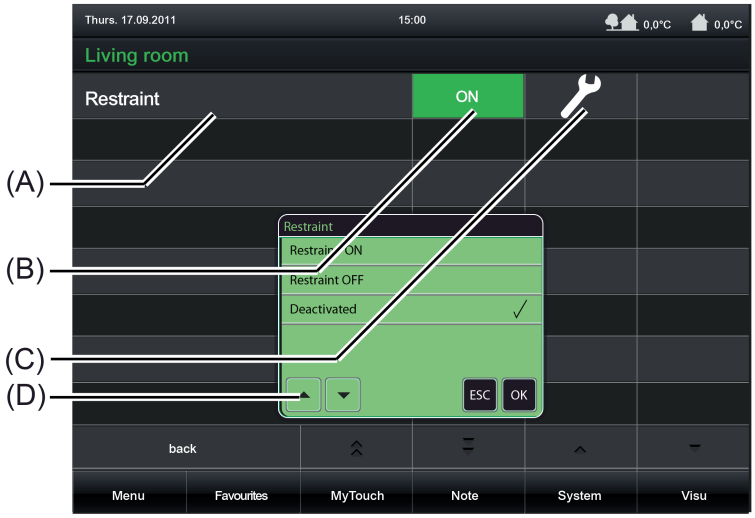


Figure 31: Example of operating and display elements of the KNX function "Restraint"

**Status elements**

The display area contains different display elements (Figure 31) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). The sensor surface for direct operation (B) displays the switching state that should be produced by the next touch, depending on the configurations in the configuration software. Appropriate colour markings and the changing of display texts is possible. After touching the sensor surface for the dialog operation in the display area (C), the dialog window (D) will open in which the controllable KNX functions can be selected (e.g. "Restrained ON"). The displayed text can be configured separately for each state in the configuration software (e.g. "FORCING ON").

**Objects**

The function "Restraint" has 2 KNX communication objects...

- "Switching" (1-bit transmitting and receiving):
  A switching telegram for activating the states "Normal operation OFF", "Normal operation ON" is transmitted to the bus via this object after pressing the sensor element. This object must be linked with the input object of the activated actuator (normally "Restraint").
  Similarly to the operation, telegrams received via this object activate the status elements. The switching state received via this object is evaluated if no restraint is activated.

- "Forced object" (2-bit transmitting and receiving):
  A switching telegram for the restraint "Restrained OFF" and "Restrained ON" is transmitted to the bus via this object after pressing the sensor element. This object must be linked with the forced object of the activated actuator.
  Similarly to the operation, telegrams received via this object activate the status elements. The state of the restraint received via this object is evaluated with a higher priority than the object "Switching".

### 4.2.4.3.16 Operating function "Internal open page"

With the function "Internal open page" one of the display pages configured internally in the device is opened. In this way, it is possible to implement navigation elements on display pages. The function is always executed as a direct operation. No distinction is made between short and long operations.

The function "Internal open page" has the area for the name (A) and a sensor surface for direct operation (B) in the graphic interface.
If an internal page is opened via the sensor surface for direct operation, no telegram is transmitted the bus. Consequently, the function does not have its own communication objects.

The parameter "target" specifies which page is to be recalled during an operation.

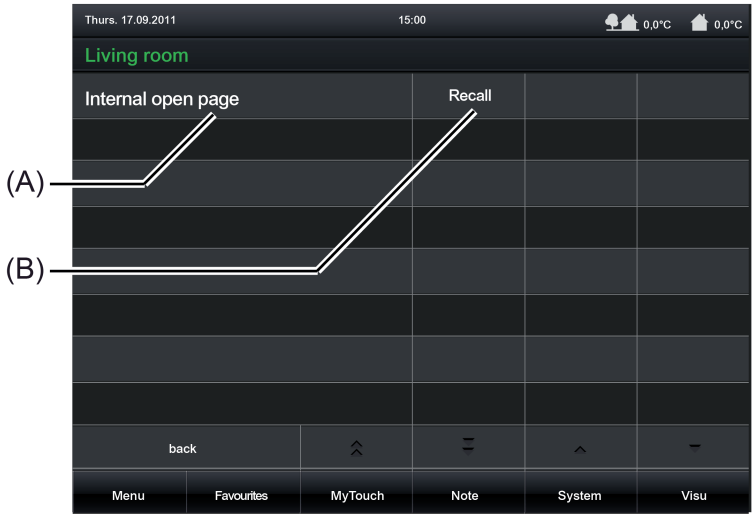


Figure 32: Example of operating elements of the function "Internal open page"

#### Status elements

The name of the function can be changed. The sensor surface for direct operation (B) displays the "Recall" button.

#### Objects

If an internal page is opened via the function "Internal open page", no telegram is transmitted to the bus. Consequently, the function does not have its own communication objects.

### 4.2.4.3.17 Display function "Date / Time"

The function "Date / Time" is purely a display function for displaying the current time and current date of the internal system clock of the device. The function does not have any operating element or its own communication objects.

The display element of this function is controlled by the device's internal system clock (time and date of the operating system). Consequently, a valid time and current date must be preset to ensure correct display. The system clock can be set directly in the operating system (also per IP via SNTP) via the communication objects "Time" (KNX DPT 10.001) and "Date" (KNX DPT 11.001) or via the system settings in the administration area.

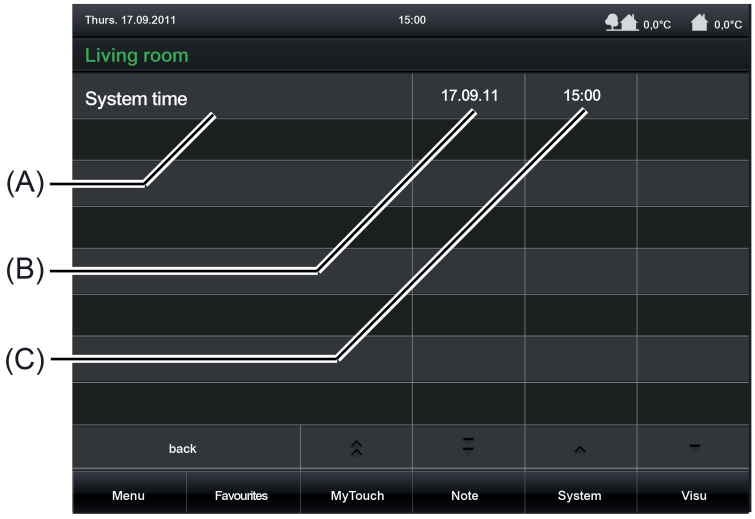


Figure 33: Example of display elements of the function "Date / Time"

#### Status elements

The display area contains different display elements (Figure 33) that are influenced by parameters. The display of the date (B) and time (C). The parameter "Date time format" defines the mode of appearance. Optionally, it is also possible just to display the date or time. The parameters "Date display format" and "Time display format" define the format of the display elements and make it possible to adapt the date and time display to international systems.

To adjust the time to various time zones, the system time display can be shifted hourly by a time offset. The parameter "Time offset" is provided for this purpose. The set value (-12...0...12) defines the time shift directly in hours.

#### Objects

The function "Date / Time" derives the display information from the device's internal system clock. Therefore, this display function does not have its own communication objects.

### 4.2.4.3.18 Display function "KNX Time"

The function "KNX Time" is purely a display function for displaying a time received via a telegram. The function has no operating element.

**Status elements**

The display can be influenced by parameters. A name can be assigned to each KNX function in the configuration software. The parameter "Time display format" defines the format of the display element and makes it possible to adapt the time display to international systems.

To adjust the time to various time zones, the time display can be shifted hourly by a time offset. The parameter "Time offset" is provided for this purpose. The set value (-12...0...12) defines the time shift directly in hours.

**Objects**

The function "KNX time" has one KNX communication object...

- "Time" (3-byte receiving):
  The current time is transferred to the display element via this object. The data format must correspond to the KNX DPT 10.001.
  The day contained in the time telegram is not evaluated by the display element.

### 4.2.4.3.19 Display function "KNX Date"

The function "KNX Date" is purely a display function for displaying a date received via a telegram. The function has no operating element.

**Status elements**

The display can be influenced by parameters. A name can be assigned to each KNX function in the configuration software. The parameter "Date display format" defines the format of the display element and makes it possible to adapt the date display to international systems.

**Objects**

The function "KNX Date" has one KNX communication object...

- "Date" (3-byte receiving):
  The current date is transferred to the display element via this object. The data format must correspond to the KNX DPT 11.001.

### 4.2.4.3.20 Display function "ASCII text display"

The function "ASCII text display" is purely a display function for displaying a text received via a telegram in accordance with ASCII encoding. Thus, it is possible for example to visualise the status of a KNX alarm centre.
The function has no operating element.

When a text is received, it is possible to optionally play back an audio file via the device's integrated loudspeaker. If the parameter "On receipt of acoustic signal" is set, the device will play back the audio file specified in the configuration software once in full for each new telegram. It is useful to use this acoustic display function if text displays should signal important events or states to the user of the device. In this case, it is advisable to use short and understandable signal tones.
The device can play back media files in "*.wav" format. The formats "PCM" and "MP3" are supported.

Upon receipt of a value, the display will jump directly to the display page of the text display if the parameter "Upon receipt switch on display illumination / display element" is set. In this case, the display illumination is also switched to the work brightness. Otherwise, the updating of the text display element takes place in the background.

The acoustic signal and direct display of the text and switching on of the display illumination during the update can be suppressed - during the night for example - if necessary. The ASCII text display has its own disabling function for this purpose. As soon as the disabling function is active (telegram polarity configurable), the text display is still. The display element is then updated in the background.

#### Status elements

The display area contains different display elements that are influenced by parameters. A name can be assigned to each KNX function in the configuration software. The parameter "Length of the ASCII text" defines the number of text characters to be displayed (max. 14). If the number of characters in the text exceeds the defined number of text characters, the text will be truncated in the display.
Example: Length of the ASCII text =10 -> the object receives a longer text -> the text is truncated in the display after the 10th character.

#### Objects

The KNX function "ASCII text display" has up to 2 KNX communication objects...

- "ASCII Text" (14-byte receiving):
  The text to be displayed is communicated to the display element via this object. The data format must correspond to the KNX DPT 16.001.
- "Disabling object" (1-bit receiving):
  This function activates or deactivates the disabling function of the text display element. The telegram polarity (disable / enable) can be configured in the configuration software.

### 4.2.4.3.21 Display function "collective feedback"

The KNX function "Collective feedback" is purely a display function for assessing and displaying a 4-byte collective feedback bit-orientated. As a result, it is possible to visualise the state of a defined switching channel of a compatible KNX switch actuator.
The function has no operating element.

After central commands or the return of bus voltage, the telegram load of a bus line is usually high, as many bus devices, such as switching actuators, transmit the status of their communication objects as feedback. This effect increases when each switching channel of an actuator initialises in this manner. To keep the telegram load of a KNX line low during the initialisation of the devices, collective feedback can be used for some actuators. The collective feedback summarises the switching status of all the outputs of an actuator in just one telegram. The 32 bit communication object "Collective feedback" contains bit-orientated feedback information of up to 16 switching channels (Figure 34).

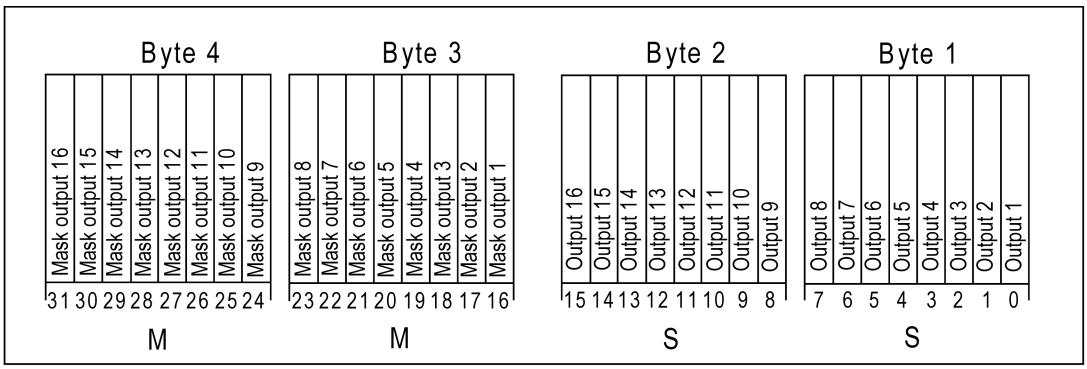


Figure 34: Telegram structure of collective feedback

It is possible to show up to 16 different switching states logically in a telegram. In so doing, each output possesses a bit, which signals the switching state ("S bit), and an additional bit, which defines the masking ("M" bit). The "S" bits correspond to the logical switching states of the outputs and are either "1" (switched on) or "0" (switched off). The "M" bits are "1" when the actuator possesses this output. In the same way, the "M" bits are "0" when the appropriate output is not available on the actuator. In the latter case, the corresponding "S" bits are continuously "0" as there is no switching status.
Example: with a 16x switching actuator, all the 16 M bits are set in a telegram as this actuator possesses all the channels which can be shown in the collective feedback. By contrast, with an 8x actuator only the first lower 8 M bits (byte 3) are set, as this actuator only possesses 8 channels. The top 8 M bits (byte 4) are thus set to "0" in the collective feedback telegram. For actuators with a different amount of channels, the number of M bits behaves in the same way.

The display element can display the switching state of an actuator channel of the collective feedback. The parameter "Channel to be evaluated" (1...16) determines which channel of the collective feedback is evaluated. The display element only evaluates the specified channel in the collective feedback telegram, i.e. it inserts the appropriate M bit and S bit (Figure 35).

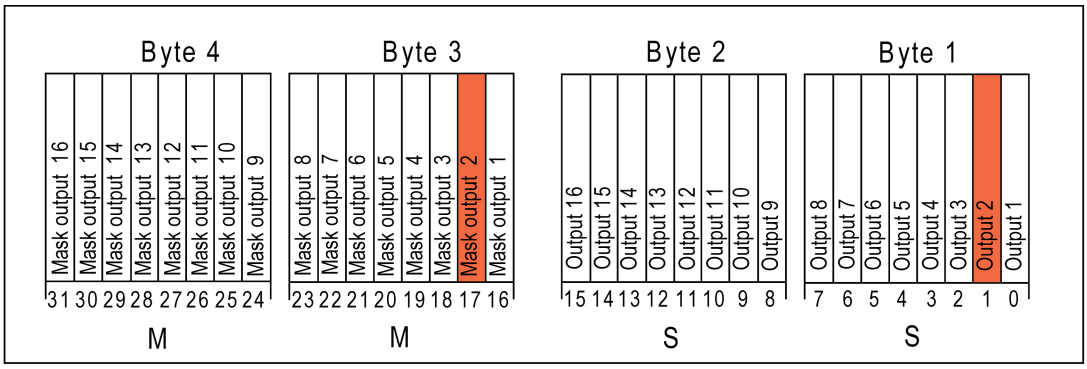


Figure 35: M bit and S bit of a display element to be evaluated

Only when the read-in M bit is set in the telegram, i.e. the channel is available on the actuator, does the device evaluate the corresponding S-bit and display the status "On" or "Off" in the display area. Either image texts or status icons can be displayed as text or an icon, according to the status indication. If the M bit of the channel to be evaluated is not set in the collective feedback telegram, i.e. the appropriate actuator channel does exit, then the display element displays the status "Invalid". This is a case of bad programming.

i Care must be taken to ensure that a unique group address is used for the collective feedback of an actuator. This group address must be connected with the collective feedback object of the actuator and with the collective feedback objects of various display elements of the device (max. 16). Ensure that, at no time, more than one actuator is connected with a collective feedback group address. If the collective feedbacks of various actuators are to be displayed on the device, then multiple group addresses must be used.

**Status elements**

The display area contains different display elements that are influenced by parameters. A name can be assigned to each KNX function in the configuration software. In addition, a status text is displayed, which visualises different texts (e.g. "Off" / "On") in the display depending on the object value of the masked collective feedback. In the configuration software the texts for the states "On", "Off" and "Invalid" can be defined separately from each other.
After a device reset, the "Invalid" state is displayed until a feedback object value of the status text is received.

**Objects**

The KNX function "Collective feedback" has one KNX communication object...

- "Feedback" (4-byte receiving):
  The value of the collective feedback is communicated to the display element via this object. This object must be linked via a group address to the object of one actuator with the same function. Additional display elements can be linked optionally to the same group address but not additional actuators!

### 4.2.4.4 Settings

A distinction is made between the various settings in the configuration of the device or individual functions. The general device parameters are already set in the configuration software before commissioning. These parameters relate to global device functions (e.g. display illumination, date/time) or to configuration and communication characteristics (e.g. group address structure, managed storage devices).
The general parameters are supplemented by user and system settings that the user can set or just simply view during operation of the device (e.g. e-mail settings, setting the screen brightness, system information). These settings can be reached via the sensor surface "System" in the footer of the display. The display then branches, among other things, to the "System settings" and "User settings" submenus.
You can return to the main menu level by pressing the "back" button in the bottom left-hand corner of the screen.

i Some device parameters that were predefined in the configuration software can be subsequently changed directly on the device during operation in the submenu of the settings.

#### 4.2.4.4.1 General device parameters

**General**

The general device parameters are available in the configuration software when the entry "Settings" is selected in the project bar. In the structure view, the following parameters are then available in the entry "General"...

- "Group address view":
  This parameter defines whether group addresses created in the configuration software and thus used in the device configuration are performed in two or three stages. The setting of this parameter must be adjusted to the setting of the group address structure of the ETS project (e.g. ETS project three-stage = group address view in the configuration software three-stage)! Otherwise, it is not possible to transfer group addresses from the ETS. An ETS4 project with a free group address structure cannot normally be included in the configuration software.
- "Automatically to the return page", "Return time" and "Return page":
  If, during operation, the device is not operated for a period of time specified by the parameter "Return time (1...120 s)", there may be an automatic jump back to a defined display page. For this purpose, the parameter "Automatically to the return page" must be set and the desired display page configured in the parameter "Return page".
- "Start page":
  The device initialises after switching on the mains power supply or after a programming operation. During this time a Start screen is shown on the display. After initialisation, the device automatically displays the screen page specified using the "Start page" parameter.
- "Application language":
  This parameter defines the language used to depict the display texts predefined by the manufacturer.
- "Status poll delay between start" and "Status poll delay after start":
  The parameter "Delay between status polls" defines the waiting time between individual status polls of the device. This parameter helps to reduce the bus load during initialisation. The parameter "Status poll delay after start" defines the waiting time before the device starts reading out values of other communication objects in the case of a status poll after initialisation. This parameter gives other devices time to initialise.

- "Telegram acknowledge":
  A display element usually shows the current value of a communication object (e.g. ON or OFF). If the communication object - normally in a feedback object - does not have a valid value, the display element will then just show a line of dashes "--" rather than the value in the display element.
  Even if the device does not receive an acknowledgement of another KNX bus subscriber - for example due to the operation of a display element - it displays this undefined status. The "Telegram acknowledge" parameter allows you to use the "Not required for status display" parameter to show a self-sent value, even without a valid acknowledgement. Caution: this setting may cause the device to display values which deviate from the real status in the KNX system. Such cases may occur, for example, if a device has a longer initialisation phase and cannot react to telegrams during this period.
  With the setting "Required for status display", an external acknowledgement of a sent telegram is always required until the device displays a valid value in the display element.
- "Number of managed removable storage devices" and "Number of managed network drives":
  Commissioning of the device is possible via the Ethernet interface (IP) or via memory access (USB memory stick, SD card, network drive). The import of new configuration data takes place directly on the device in a menu specially provided for this purpose in the user and system settings. During an import, the source of the data you want to import must be specified. These are removable storage devices or network drives. The same applies to a project data export.
  The number of removable storage devices or network drives displayed can be limited to ensure that the device does not offer the user an unlimited number of drives on the screen in the submenu of the project data import. The device does not offer more storage devices or drives on the screen to choose from than defined in the parameters "Number of managed removable storage devices" or "Number of managed network drives".

**Display illumination**

The general device parameters are available in the configuration software when the entry "Settings" is selected in the project bar. In the structure view, the following parameters are then available in the entry "Display illumination"...

- "Display illumination":
  Depending on the required installation location and the light characteristics, it may be necessary for the display to be illuminated permanently or just temporarily. In the "Continuous operation" setting, the background lighting is always switched to work brightness. It cannot be switched, either via the device or the bus. In the "On actuation" setting, the background lighting is adjusted to the set basic brightness value when idle. This means that the background lighting may even be switched off. As soon as the device is operated via the touch screen, the lighting returns to the configured work brightness. After the set "Display illumination time", the lighting returns to the set basic level of brightness. In the "On actuation or switching object" setting, the lighting is adjusted to the set basic brightness value when idle. When the touch screen is actuated or when a switching value is received via the "Display illumination" communication object, the lighting temporarily switches to the work brightness for the configured "Duration of display illumination". In addition, the lighting can also be switched off at any time via the object. The telegram polarity of the lighting object can be configured.
- "Duration of display illumination":
  This parameter defines the length of the switch-on time of the display illumination in the event that the lighting is activated when pressed or by the communication object.
- "Basic brightness (Sleep)":
  This parameter defines how bright the display illumination is when idle (no operation, not switched on via the communication object). When the basic level of brightness is set to "100 %", the display for all the settings of the "Display illumination" parameter is always at maximum brightness!

- "Work brightness (Wake)":
  This parameter defines how bright the display illumination is in the operating state (operation, switched on via the communication object, continuous operation).

i After commissioning the device, the "basic brightness" and "work brightness" parameters can be changed directly on the device in the user and system settings.

**Date / Time**

The device has an integrated real time clock (RTC). This clock is used both to display the current time and date but also to control the timer switch channels or the presence simulation. The clock can be set directly in the operating system (also per IP via SNTP) via the communication objects "Time" (KNX DPT 10.001) and "Date" (KNX DPT 11.001) or via the user and system settings directly on the device.

The general device parameters are available in the configuration software when the entry "Settings" is selected in the project bar. In the structure view, the following parameters are then available in the entry "Date / Time"...

- "Date display format" and "Time display format":
  These parameters defined the representation of time and date.

The other parameters of the device's internal system clock differentiate themselves depending on the use as master (transmitting date and/or time to the bus) or slave (receiving date and/or time from the bus).

Use as slave clock (Slave):
In most cases, within a KNX system, a device is sufficient which transmits the current time and date at regular intervals, so that all the other devices can synchronise themselves as required. If possible a device should be used which has high accuracy through the reception of the DCF 77 time signal.
The integrated real time clock of the device can be set by such an external clock. The parameter "Comparison with external clock" specifies whether the time and / or date are to be synchronised. Then, if necessary, the two communication objects "Master date" and "Master time" are created. In addition, the device can use the 1-bit communication object "Request date / time", in order to synchronise itself. This communication object transmits - if enabled in the parameters - a request telegram after each device initialisation and then regularly once a day at 4:00 a.m. The telegram polarity can be configured in the configuration software.

Use as master clock (Master):
If there is no opportunity for external bus synchronisation, then the device can transmit the date and time to the bus once a day, once an hour or once per minute (depending on the parameters) in order to synchronise other KNX devices. The parameter "Use as master clock" must be set for this purpose. The values are then transmitted using the objects "Date" and "Time". In this case, the transmission behaviour can be defined as follows...

- Parameter "Transmit on request":
  In this configuration, there is an additional 1-bit communication object with the name "Request date / time through external device" available. When the internal clock receives a switching telegram from another KNX bus subscriber via this object, it evaluates the telegram as a request and transmits the current date and its own time to the bus as a response. The telegram polarity of the external data and time request can be configured.
- Parameter "Transmit date / time cyclically" set:
  The device transmits the date and/or time to the bus cyclically. The parameter "Cycle time for date/time transmission" defines the frequency of transmission.

- It is possible to use the master and slave function of the internal clock in parallel. These functions are not mutually incompatible. For example, the device can receive the date and time from a KNX master clock and also synchronise other external bus subscribers.
- The "Date" and "Time" objects can be read out regardless of the cyclical transmission or any time by a poll (set "Read" flag).

The data point types "Date" (11.001) and "Time" (10.001) do not contain any information about whether summer time or normal time (winter time) is currently active. For this reason, the summer-/wintertime changeover can take place automatically. In the date and time properties in the Windows® operating system, it is necessary to set whether or not an automatic changeover should take place (e.g. double-click on the icon in the taskbar).

As an alternative to a synchronisation of the internal clock via KNX bus telegrams, the clock module can be set and synchronised via the Ethernet interface. For this purpose, the device can address an SNTP time server (SNTP = Simple Network Time Protocol). A time server – usually controlled by a very precise time standard – checks the current time to the exact second and the current date. The SNTP is integrated in the TCP/IP so that the time servers in the Internet can also be addressed. The device needs the IP address of any time server (preferably a server in the same time zone) to be able to initiate an SNTP request. The configuration of the SNTP time server also takes place in the Windows® operating system in the date and time properties.

- To change to the Windows® operating system, the KNX application that should always be in the foreground in normal operation must be minimized or even terminated. It is possible to terminate the KNX application by briefly pressing the ON/OFF button. In doing so, the device changes to the operating system and displays the desktop. The KNX application can alternatively be minimized via the Windows taskbar. The Windows taskbar is normally in the background and is therefore not visible. The taskbar can be accessed by connecting a USB keyboard.

**Disable device**

The general device parameters are available in the configuration software when the entry "Settings" is selected in the project bar. In the structure view, the following parameters are then available in the entry "Disable device"...

- "Device can be disabled via object":
  This parameter determines whether the device can be disabled globally. A disabled device displays a disabling logo on the screen (optional) and can execute a special disabling function if required. All other display and operating functions are then out of operation.
  If the disabling function should be used, the parameter "Device can be disabled via object" must be set.
- "Disabling logo":
  A globally disabled device displays a disabling logo in the centre of the screen. Thus, it is possible to indicate to the operator that the device cannot be operated at the moment or only to a limited extent (see Disabling function).
- "Behaviour of disabling object":
  This parameter predefines the telegram polarity of the object for the global disabling of the device.
- "Disabling function - Press action"
  A globally disabled device can execute a special operating function if necessary (e.g. switch lighting for cleaners). This parameter defines the function and - if necessary - the data format of the disabling function. These settings are possible: "Switching", "Value" (1-byte, 2-byte, 4-byte) and "internal light scene" (recall).
  Additional parameters (transmission value etc.) may possibly be available depending on this parameter setting.

A disabling function only implements one operating function. Display elements (such as for the feedback of a switching or brightness state) are not available.

**e-mail**

If the device is connected to a network via the Ethernet interface, the e-mail function can be used. e-mail is a service in computer networks allowing electronic messages to be exchanged between a sender and one or more recipients. Alongside the World Wide Web (www), e-mail is the most currently used service on the Internet.

The device is also able to send e-mail messages by using the SMTP protocol. To use this function, the device operator must have a valid e-mail account in a local network or the Internet. Most Internet Service Providers (ISP) usually offer their customers e-mail accounts.

The configuration of the e-mail account takes place fundamentally in the configuration software with the general device parameters and can be changed to a limited extent at any time directly on the device in the user and system settings. In this way, the device operator can configure his e-mail account at any time and independently of the ETS or configuration software.

The general device parameters are available in the configuration software when the entry "Settings" is selected in the project bar. In the structure view, the following parameters are then available in the entry "E-Mail"...

- "Port":
  The e-mail is sent by the SMTP protocol via a specific port. This is defined to "25" as standard. To allow the SMTP port to be adapted to the available services, especially in administered networks, it is possible here to enter the necessary port in the configuration.
- "Authentication" and "Password":
  At this point, it is necessary to specify whether the addressed SMTP server requires authentication. If this is the case, it is also necessary to configure a valid password for the outgoing mail server.
- "Encryption":
  An e-mail can be sent encrypted. Some SMTP servers require a specific type of encryption. This parameter defines the encryption type used by the device when sending an e-mail to the specified e-mail account. The encryption can be deactivated optionally (setting "none").
- "Username":
  The username of the e-mail account must be specified here. This name is used to log in to the SMTP server.
- "Sender":
  This parameter specifies the sender address entered automatically into the sender address field by the device when sending an e-mail.
- "Server name":
  Here the name of the SMTP server is specified in the form of a URL (e.g. "smtp.example.de"). Alternatively, it is also possible to directly specify the IP address of the server.

To ensure that the device can send e-mails, the IP settings in the Windows® operating system must be configured correctly. This includes the device's own IP address, the sub-network mask, the addresses of the standard gateway (e.g. Internet router) and a valid DNS server as well as settings for an optionally available firewall.
To change to the Windows® operating system, the KNX application that should always be in the foreground in normal operation must be minimized or even terminated. It is possible to terminate the KNX application by briefly pressing the ON/OFF button. In doing so, the device changes to the operating system and displays the desktop. The KNX application can be minimized via the Windows taskbar. The Windows taskbar is normally in the background and is therefore not visible. The taskbar can be accessed by connecting a USB keyboard.

**Digital picture frame**

The device is used primarily to display statuses with a KNX installation and to control system functions. In moments whenever the device is not used for displaying and operating KNX functions (e.g. if no operation occurs for a long time), it can work as a digital picture frame. In this function, the TFT screen of the device with a resolution of 800 x 480 pixels (22.7 cm [9"], 16:9) can represent colour images on a network drive or on a removable storage device (USB stick, SD-card). In this way, it is easily possible to display static single images as well as a series of images with an effective change of image. Besides personal photos for personal use, this can also be advertising images for public or commercial areas.

The configuration of the digital picture frame is carried out in the configuration software with the general device parameters. Some settings, such as the selection of the images, must be set directly on the device in the user and system settings. In this way, the device operator can adapt the contents and function of the digital picture frame at any time and independently of the ETS or configuration software.

The general device parameters are available in the configuration software when the entry "Settings" is selected in the project bar. In the structure view, the following parameters are then available in the entry "Digital picture frame"...

- "Start automatically" and "Waiting time until start":
  This parameter determines whether the digital picture frame is active and whether the displaying of images should start automatically after a defined time without any operation on the device. "Waiting time until start" defines this time.
- "Automatic start via disable object" and "Behaviour of disabling object":
  An automatic start of the images can be disabled by a separate 1-bit object if required. The parameter "Automatic start via disable object" must be set for this purpose. This is advisable, for instance, if the image display should not be started or interrupted at certain times of the day or night because they have a disturbing effect on the environment. The parameter "Behaviour of disabling object" defines the telegram polarity of the disabling object.
  An image display that has already started can be cancelled by the disabling object. A restart of the image display is only possible when the disabling object is deactivated.
- "Replacement Image":
  If the image display has started but no image data was specified or is not available (because the network drive or removable storage device is not available), the device will display the replacement image. If the digital picture frame is used, it is recommended to configure a replacement image so as to preserve a static image display at least.
- "Display duration of an image":
  If several images were selected for display, the device will change over the images after the time defined here has elapsed. The display sequence is fixed alphabetically by the file name.
- "Effect upon image change":
  If several images were selected for display, the type of image changeover can be configured here.

i An image display that has started does not influence the brightness control of the display illumination. Once the length of the display illumination set in the configuration software has elapsed, the brightness always switches over to basic brightness. In the "Basic brightness = 0 %" setting, the image display is then no longer visible either.

i If the connection to the removable storage device or network drive on which the images to be displayed is interrupted, the device aborts the image display. In this case, the replacement image is displayed. If no replacement image is configured, the screen will display nothing.

i Functions with a higher display priority (e.g. signalling system, fault messages, display of an ASCII text with audio playback) abort the image display.

i The configured or predefined images are scaled proportionally to the screen height for display.

The replacement image specified in the configuration software is copied to a special project directory. When saving the configuration, this image is also written in the project file in order to be available in other PC environments as well. During commissioning, the image is transferred to the device in the original file size and stored in the device memory. To avoid having to commit large amounts of storage resources, the size should be adapted to the display size of the screen as much as possible.

#### 4.2.4.4.2 User and system settings

**Service address**

The service address is available in the submenu "System" (C) (Figure 36). The service address is shown on the display of the device by pressing "Service address" in the submenu. The name of the operating element (e.g. "Service address") can be predefined in the configuration software. You can return to the previous menu level by pressing the "back" button in the bottom left-hand corner of the screen.
In case of any problems in the KNX system or with the device, users can contact the service address. The information displayed, e.g. a company name and address data in up to 5 lines (B), is predefined in the configuration software as a parameter. These cannot be changed later directly on the device. Optionally, it is possible to display a company logo (A).

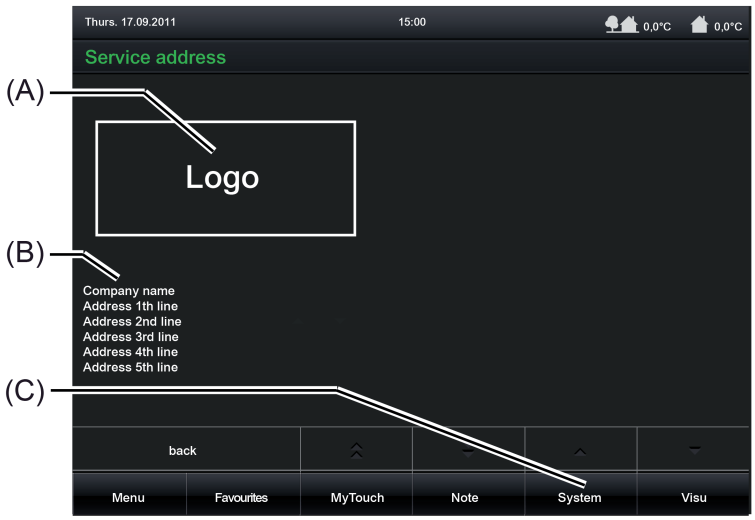


Figure 36: Example of displaying a service address

The company logo specified in the configuration software is copied to a special project directory. When saving the configuration, this logo is also written in the project file in order to be available in other PC environments as well. During commissioning, the logo is transferred to the device in the original file size and stored in the device memory. To avoid having to commit large amounts of storage resources, the size should be adapted to the display size of the screen (approx. 180 x 110 pixels) as much as possible.

**Default settings**

In the system settings it is possible to reset the device to default settings (Figure 37). To do this, press the sensor surface "Set" (A) to the right of "Default settings" in the submenu "System settings".
After pressing the sensor surface "Set", it must be decided whether or not to actually reset the device to the default settings. A dialog window (B) will additionally open. If the "ESC" button in this dialog window is pressed, all current settings are preserved. If, however, the "OK" button is pressed, the device will then reset itself to its default settings. As a result, all user-specific settings configured directly on the device (e.g. switching times of the timer, scene values, transmission values of transmitter functions) will be lost! Functions and parameters defined in the configuration software are preserved.

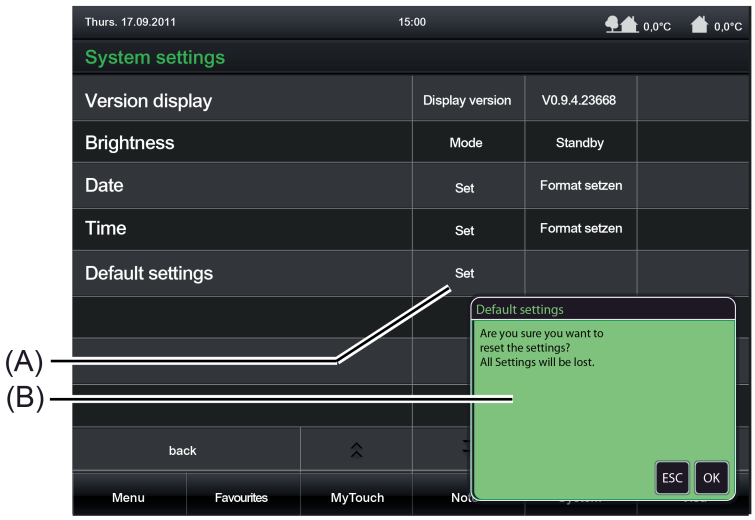


Figure 37: Menu for resetting to default settings

## System information

In the submenu "System settings", general system information can be displayed (Figure 38). These can be important, for example, during device support. After pressing the sensor surface "Display version" (A), a dialog window (B) will open with the system information in text form. The name of the operating element (e.g. "Version display") can be predefined in the configuration software. The dialog window will close after pressing the "OK" button.

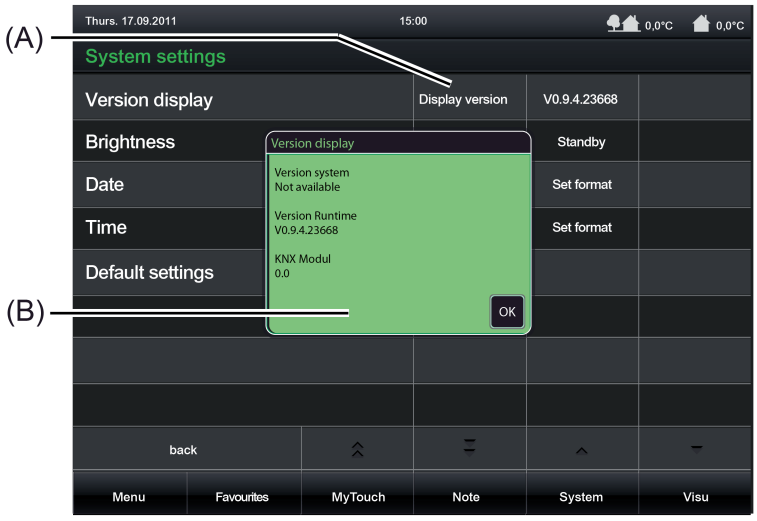


Figure 38: Menu for displaying the system information

### Brightness of the display illumination

In the submenu "System settings", the display brightness can be configured (Figure 39). In this way, it is possible to later change the work brightness for operation and the basic brightness for standby originally specified in the configuration software and thus adapt to the user's individual needs.
After pressing the sensor surfaces "Operation" or "Standby" (A), a dialog window (B) appears, in which the percentages for the brightness can be entered and confirmed by pressing the "OK" button. The dialog window will close after pressing the "OK" button.


Figure 39: Menu for setting the display brightness

### Date

In the submenu "System settings", it is possible to set the date of the device's internal system clock. This date is used for displaying the date in the display as well as for controlling the timer switch channels or the presence simulation, for example.

By pressing the sensor surface "Set format" a dialog window (Figure 40) will open, in which the date format can be set.
After confirming (press "OK") or discarding (press "ESC") the entry, the dialog window will close.

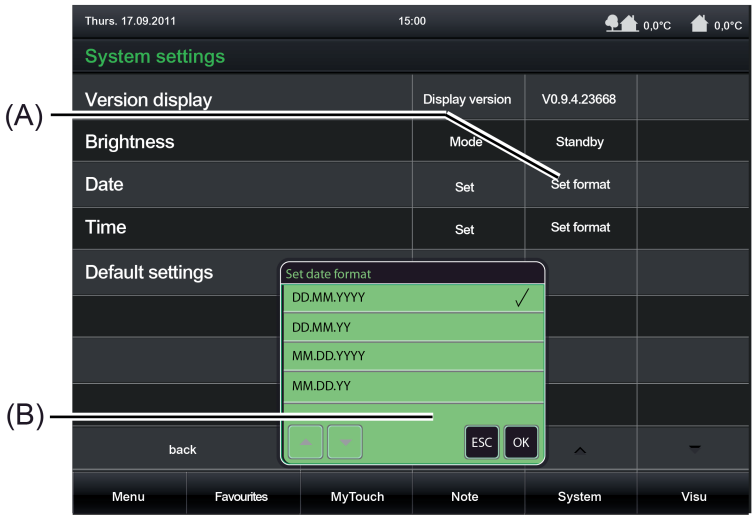


Figure 40: Menu for configuration of the date display


Figure 41: Menu for setting the date display

By pressing the sensor surface "Set" a dialog window (Figure 41) will open, in which the date can be entered.
After confirming (press "OK") or discarding (press "ESC") the entry, the dialog window will close.

**Time**

In the submenu "System settings", it is possible to set the time of the device's internal system clock. This clock is used to display the current time and to control the timer switch channels or the presence simulation.

By pressing the sensor surface "Set format" a dialog window (Figure 42) will open, in which the date format can be set.
After confirming (press "OK") or discarding (press "ESC") the entry, the dialog window will close.

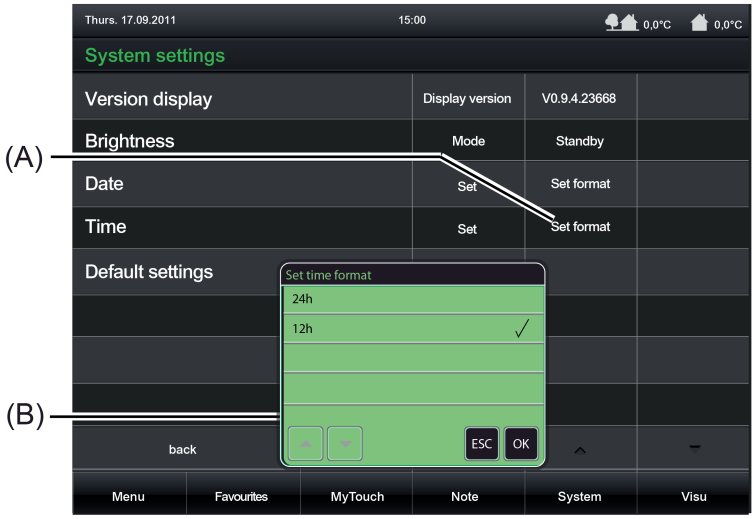


Figure 42: Menu for the setting and configuration of the time display


Figure 43: Menu for setting the time

By pressing the sensor surface "Set" a dialog window (Figure 43) will open, in which the time can be entered.
After confirming (press "OK") or discarding (press "ESC") the entry, the dialog window will close.

- The clock can alternatively be set directly in the operating system (also per IP via SNTP) via the communication objects "Time" (KNX DPT 10.001) and "Date" (KNX DPT 11.001).
- In the user and system settings it is not possible to influence the summer-/wintertime changeover of the system clock. This is possible in the Windows® operating system. To change to the operating system, the KNX application that should always be in the foreground in normal operation must be minimized or even terminated. It is possible to terminate the KNX application by briefly pressing the ON/OFF button. In doing so, the device changes to the operating system and displays the desktop. The KNX application can alternatively be minimized via the Windows taskbar. The Windows taskbar is normally in the background and is therefore not visible. The taskbar can be accessed by connecting a USB keyboard.

### Digital picture frame

The device is used primarily to display statuses with a KNX installation and to control system functions. In moments whenever the device is not used for displaying and operating KNX functions (e.g. if no operation occurs for a long time), it can work as a digital picture frame. In this function, the TFT screen of the device with a resolution of 800 x 480 pixels (22.7 cm [9"], 16:9) can represent colour images on a network drive or on a removable storage device (USB stick, SD-card). In this way, it is easily possible to display static single images as well as a series of images with an effective change of image. Besides personal photos for personal use, this can also be advertising images for public or commercial areas.

In the submenu "Application settings", it is possible to influence the function of the digital picture frame and select the images to be displayed. By pressing the sensor surface "Edit digital picture frame" a dialog window will appear for configuration of the picture frame (Figure 44). After confirming or discarding the entry by pressing "OK" or "ESC", the dialog window will close.


Figure 44: Menu for setting the digital picture frame

The settings have the following meaning...

- "Path":
  The images to be displayed are specified here. By pressing the control surface a file browser is displayed on the screen that allows you to select the image files. The source must be a removable storage device (USB stick, SD-card) or network drive. The images must correspond to the formats *. JPG or *. PNG.
  If the image display has started but no image data was specified or is not available (because the network drive or removable storage device is not available), the device will display the replacement image defined in the configuration software.
- "Display length":
  If several images were selected for display, the device will change over the images after the time defined here has elapsed (corresponds to the parameter "Display duration of an image" from the configuration software). The display sequence is fixed alphabetically by the file name.
- "Effect":
  If several images were selected for display, the type of image changeover can be configured here (corresponds to the parameter "Effect upon image change" from the configuration software).
- "Start automatically":
  This setting (checkmark set) determines whether the digital picture frame is active and whether the displaying of images should start automatically after a defined time without any operation on the device (corresponds to the parameter "Start automatically" from the configuration software). The waiting time that must elapse until the image display starts is defined in the configuration software only.

**e-mail**

If the device is connected to a network via the Ethernet interface, the e-mail function can be used. e-mail is a service in computer networks allowing electronic messages to be exchanged between a sender and one or more recipients. Alongside the World Wide Web (www), e-mail is the most currently used service on the Internet.

The device is also able to send e-mail messages by using the SMTP protocol. To use this function, the device operator must have a valid e-mail account in a local network or the Internet. Most Internet Service Providers (ISP) usually offer their customers e-mail accounts.

The configuration of the e-mail account takes place fundamentally in the configuration software with the general device parameters and can be changed to a limited extent at any time directly

on the device in the user and system settings. In this way, the device operator can configure his e-mail account at any time and independently of the ETS or configuration software.

The e-mail parameters are available in the submenu "User settings". By pressing the sensor surface "E-mail account settings" a dialog window will appear for changing the E-mail settings (Figure 45). The name of the operating element (e.g. "E-Mail") can be predefined in the configuration software. After confirming or discarding the entry by pressing "OK" or "ESC", the dialog window will close.


Figure 45: Menu for setting the e-mail account

Under "Server" the name of the current SMTP server is displayed in the form of a URL (e.g. "smtp.example.de") or IP address (corresponds to the parameter "Server name" in the configuration software).
Under "Mode" the encryption type required by the SMTP server can be configured. This setting is then applied immediately.
Under "Port" the port for the SMTP service can be set (Standard: 25).

Under "Login" and "Password" the user name and password are displayed (corresponds to the parameters "User name" and "Password" in the configuration software).
Under "Sender address" the e-mail sender is entered. This setting (corresponds to the parameter "Sender" in the configuration software) specifies the sender address entered automatically into the sender address field by the device when sending an e-mail.

It is possible to specify an anonymous authentication (=without password) in the configuration software. In this case, the password on the device in the user and system settings is still present (empty text field). A password can be assigned here later if necessary and thus switched over to a password authentication.

To ensure that the device can send e-mails, the IP settings in the Windows® operating system must be configured correctly. This includes the device's own IP address, the sub-network mask, the addresses of the standard gateway (e.g. Internet router) and a valid DNS server as well as settings for an optionally available firewall.
To change to the Windows® operating system, the KNX application that should always be in the foreground in normal operation must be minimized or even terminated. It is possible to terminate the KNX application by briefly pressing the ON/OFF button. In doing so, the device changes to the operating system and displays the desktop. The KNX application can be minimized via the Windows taskbar. The Windows taskbar is normally in the background and is therefore not visible. The taskbar can be accessed by connecting a USB keyboard.

### History

The device stores various events and internal operations in a history list. An event entered in the history list could be a device restart (reset) or a programming operation with date and timestamp. Various error states are also logged in the history list. The history can be important, for example, during device support.

The history is available directly in the submenu "System" (Figure 46). After pressing the sensor surface "History", the device displays the history list. You can return to the menu level "System" by pressing the "back" button in the bottom left-hand corner of the screen.

"I²C: Error": may occur, for example, during download. If the message "I²C: OK" comes again immediately, the message can be ignored.

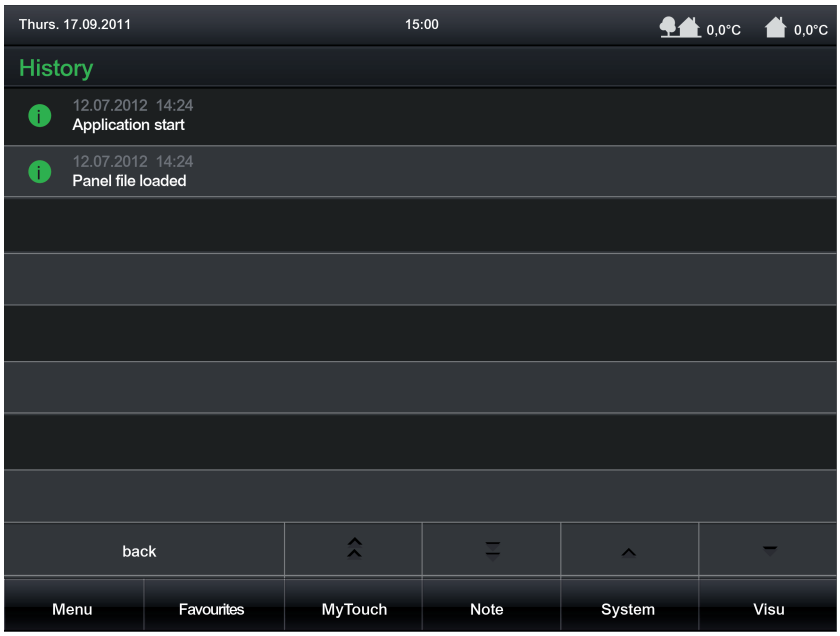


Figure 46: Menu for the history

### Password

The opening of pages can optionally be protected by a password. Up to 4 password levels are available for this in the device. To activate the password protection, a password level must be assigned to a display page in the configuration software. The corresponding page will first then be displayed by an open page request (external or internal open page) if the correct password assigned to the level was entered. The display page of the signalling system and the commissioning are protected by their own password levels.

The default passwords of the four levels are (incl. passwords for the signalling system and commissioning function)...

- Level 1: "11111"
- Level 2: "22222"
- Level 3: "33333"
- Level 4: "44444"
- Signalling system: "9999"
- Commissioning: "0000"

The passwords are not defined in the configuration software. They are only saved in the device and must also be changed there. The passwords can be customized in the submenu "Settings". By pressing the sensor surface "Password", the device displays the password list.

Tapping an operating element causes the screen mask to open in the password list, giving the option of entering and saving a new password (Figure 47).

It is advisable to activate the password protection for the display page of the passwords so that the setting of new passwords is protected against unauthorised access. This is done by assigning the display page in the configuration software to a password level.

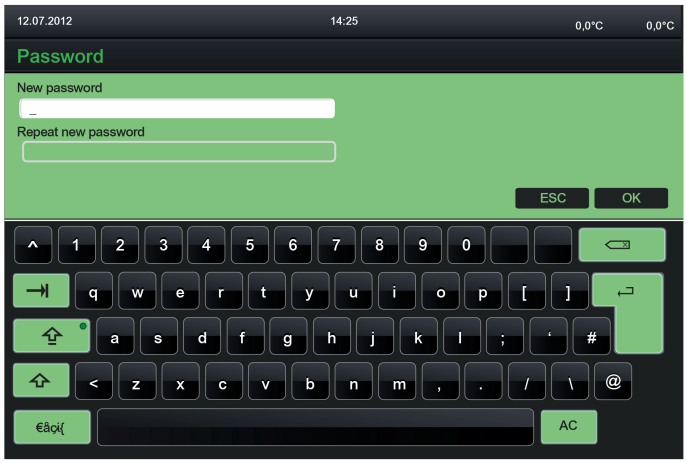


Figure 47: Mask for configuration of the passwords

The passwords set directly on the device are not overwritten after a commissioning operation of the device and are not lost after a power failure either.

Resetting of the passwords - should the page of the password list be protected by a lost password - can be carried out as follows:
Open the corresponding project in the configuration software. Remove the password protection in the parameterisation of the display page for the passwords. Perform commissioning operation. Reassign the corresponding password directly on the device on the page of the passwords and save. Go back into the configuration software and reset the password protection of the display page for the passwords. Perform a commissioning operation once again.

### Limiting values

The device allows the limiting value monitoring of 1-byte, 2-byte and 4-byte values in different data formats. A maximum of 40 limiting value modules are available that can be created individually and configured in the configuration software under "Logic Editor". The limiting value modules have one value input object each. The value received via this object is compared

continuously with the configured limiting values. Each limiting value module also has two limiting values each with 1-bit communication objects for monitoring a lower and upper limit. Alarm or message telegrams can be transmitted to the bus via these 1-bit objects if the lower or upper limiting value was fallen short of or exceeded.
The limiting values are predefined in the configuration software depending on the set data type of the value object. The limiting values can be changed directly on the device in the user and system settings and can therefore be adapted to individual needs or requirements. This is only possible, however, if the individual limiting values in the configuration software are configured as changeable.

Limiting values can be edited if the sensor field "Limiting values" in the submenu "Application settings" is pressed. The device then displays a list of all existing limiting values.

On the display page of the limiting values it is necessary to decide which limiting value should be edited. After pressing a sensor surface (A) or (B), a dialog window (C) will open that allows the limiting values of a limiting value module to be set directly .

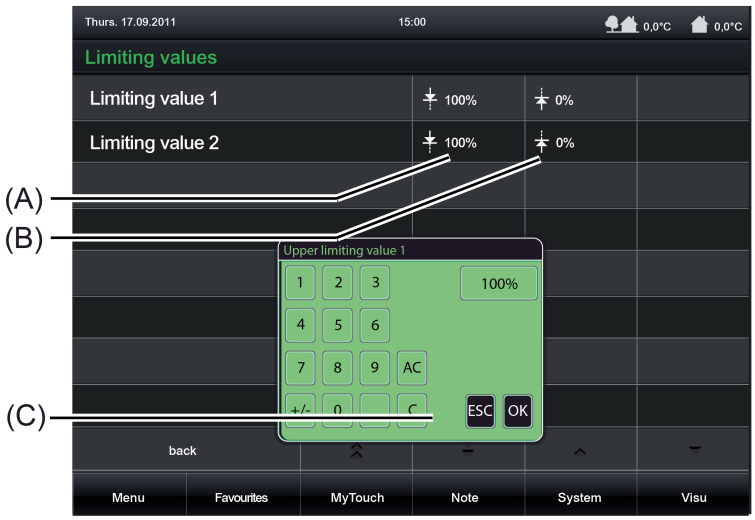


Figure 48: Menu for setting the limiting values

Limiting values can also be optionally changed externally via a communication object.

**Import / Export**

Commissioning of the device is possible by IP access via the Ethernet interface or alternatively via memory access (USB memory stick, SD card, network drive). In the case of commissioning by means of memory access, the project data created in the configuration software and saved in a commissioning file must be imported to the device. This is possible directly on the device in the user and system settings.
The device also offers the option of exporting a configuration that is present in the device memory to a file. This is useful, for example, if no project data is available for the project.

Commissioning (Import of a commissioning file):
The import of a commissioning file is possible in the submenu "User settings". By pressing the sensor field "Commissioning" the device will display a file browser with all USB storage devices and network drives available in the operating system. The drive containing the commissioning file necessary for the import must be clicked on here.

i The number of removable storage devices or network drives displayed can be limited to ensure that the device does not offer the user an unlimited number of drives on the screen in the file browser. The device does not offer more storage devices or drives on the screen to choose from than defined in the parameters "Number of managed removable storage devices" or "Number of managed network drives". These parameters are available in the general device settings in the configuration software.

By pressing the sensor field "Open" you can then open the selected drive and display a list of all folders and commissioning files (file format *.gdct9) contained therein.

After selecting the desired commissioning file (only one file can be selected at a time), the sensor surface "Open" must be pressed to perform the import. The import then starts immediately. The progress of the import is shown in the display of the device. After completing the import, the device works immediately with the new configuration data and is ready once again for operation.

i Before importing a new configuration file, it is advisable to make a backup of the existing configuration by means of an export.

Commissioning Export (Export of a project file):
It is possible to export an existing configuration in the device by pressing the corresponding operating element in the submenu "Settings". The process for selecting the drive and storage location of the project file to be exported is essentially identical to the import process. To save a project file, the corresponding storage location must first be selected. The sensor surface "Save" must then be pressed. Thus, a dialog window for entering the file name will open. The save operation is started by pressing sensor surface "OK". This might take a few seconds.

i The import of the created file takes place in the configuration tool via commissioning - reconstruction - file.

### 4.2.4.5 Fault messages

**Fault messages**

In contrast to the normal display and operating functions, fault messages have the following distinctive features...

- A specific message page can be displayed irrespective of the current display page (high display priority).
- An acoustic signal can be sounded during an active message.
- The user can demand an acknowledgement.
- Faults can be entered in a separate message list.

### 4.2.4.5.1 Creating fault messages and the message window

**Creating a fault message**

Up to 50 different fault messages can be managed in the configuration software. Fault messages are added to the configuration in the structure view if the entry "Fault messages" is selected in the project bar. Fault messages there can also contain a specific name.
A 1-bit "Fault signal object" is created for each fault message added. The parameter "Activation by object value" defines when a message is activated via the fault signal object (e.g. activation through "1" telegram). The opposite value deactivates the message (e.g. deactivation through "0" telegram). In addition, a text can be specified for each fault, allowing the fault message to be identified later.

The parameter "Acoustic signal" determines whether the device plays back an audio file via the loudspeaker when there is an active fault message. It is useful to use this acoustic signalling function if fault messages should signal important events or states to the user of the device. In this case, it is advisable to use short and understandable signal tones.
The device can play back media files in "*.wav" format.

If individual fault messages are particularly important or fault messages can be traced back to similar sources (e.g. smoke detectors), other fault messages that are active at the same time can be disabled in the device. This is done in the parameter area "Exceptions" directly in the configuration software for fault messages that should receive a high priority. Any one of the fault messages configured in the device can always be selected by clicking on the button "Add fault message". These messages are then suppressed and thus receive a lower priority.

**Message window**

As soon as a fault message is active, a warning symbol (A) appears in the header of the display screen (Figure 49). After pressing the symbol, a dialog window (B) will become visible. This dialog window contains an overview of all active fault messages in list form. Furthermore, some of the last (inactive) fault messages are also listed in the list. The fault message last activated is always at the top of the list.
The warning symbol is highlighted in red if there are fault messages that have not been acknowledged. It turns yellow when all fault messages have been acknowledged but some of them are still active.


Figure 49: Global display of active fault messages

If a message is pressed in the dialog window, the message window will appear with a detailed description of the message (Figure 50).

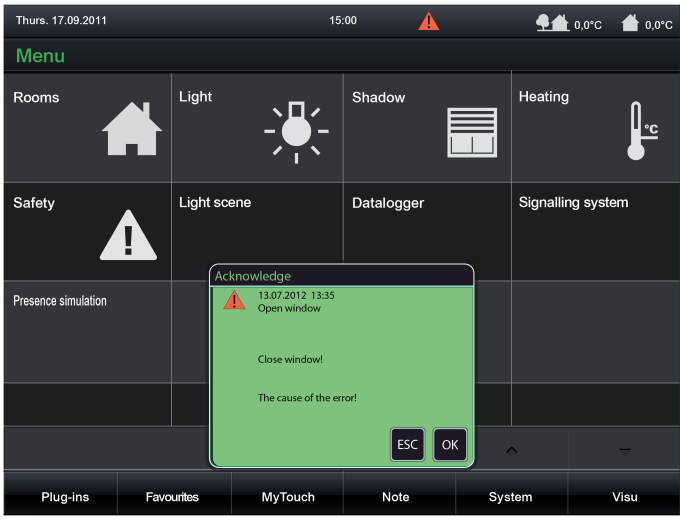


Figure 50: Message window

The message window can optionally be opened automatically as well when a new fault message is received on the device. This behaviour is set by the parameter "Open message window", which is available in the configuration software specifically for each fault message.

The message window displays information relating to the selected fault message. The time stamp of the fault is displayed in the first line. This time stamp identifies the time (date and time) when the message was recorded as "coming". The time stamp is followed by the name of the fault message. This text can be configured in the configuration software (max. 20 characters) and is also accepted in the message list, if an entry is to be made. The physical address of the sender of the fault message can optionally follow the name. The parameter "record sender address" specifies whether or not the sender address is displayed in the message window.

The message window displays the status of the selected fault message in plain text. In this way, it is possible to identify whether or not the fault message is still active. Above this is a display

text which can be configured freely in the configuration software (max. of 20 characters each). An external text received from the device via a separate 14-byte object can be displayed if required. If a fault message arrives, the corresponding ASCII object is polled and the response telegram is displayed.

The message window can be closed by pressing the "OK" button.

### 4.2.4.5.2 Acknowledgment and message list

**Acknowledgement of a fault message**

A fault message can either be confirmed internally by pressing the "OK" button in the message window (internal acknowledgement) or via the bus by means of a separate 1-bit communication object (external acknowledgement).

With internal acknowledgement, the parameter "Transmit value on acknowledgement" in the parameters of a fault enables the following acknowledgement properties of the operating element "Acknowledgement" to be defined in the message window...

- Parameter not set: When the operating element is pressed, the acknowledgement is only processed internally. No information is sent to other devices.
- Parameter set: An additional "acknowledgement object" is made visible. When the operating element is pressed, the acknowledgement is also sent to other devices via this 1-bit object. The telegram polarity of the acknowledgement object can be configured.

i The acknowledgement is not sent in the case of external acknowledgement.

An additional 1-bit communication object can be enabled for implementing external acknowledgement. If the parameter "Allow external acknowledgement" is set, a fault message can also be acknowledged by other KNX devices. In this case, the "Acknowledgement receipt object" is displayed.

i When a fault message is acknowledged, an acknowledgement event is logged in the message list (see next section).

**Message list**

If necessary, it is possible to set separately in the parameters whether each fault message should be saved in the message list of the device. The message list is a separate display page that can be reached via the main menu.

The following events of a fault can be logged in the message list...

- Time of the fault message, logged as "coming",
- Time the fault message is retracted (fault cause eliminated), logged as "going".
- Time of acknowledgement, logged as "acknowledged".

In the "Message list" parameter group of a fault message it is possible to configure which of the three named events is logged in the message list. In addition, the "Fault text" and the time stamp are logged and displayed in the message list, thus allowing clear identification.

i The message list is deleted after a commissioning operation of the device. If the power supply fails, the events stored in the message list are not lost.

### 4.2.4.6 Scene function

#### 4.2.4.6.1 Definition and function

The device can manage up to 24 internal scenes in which up to 32 different scene functions (actuator groups) can be activated that affect the KNX. The internal scenes can be controlled by the operation functions (see page 89) as well as by a separate extension object. Control by means of the extension object - such as a pushbutton with a scene extension function - is only possible if a group address in the parameter branch of the scenes for the global scene settings is linked with the object.
The extension object according to KNX DPT 18.001 can be used both to open and save the scenes. The scene received via the object specifies which internal scene should be recalled or saved. The configuration software automatically assigns numbers from 1 to 24 to the scenes created. No other scene numbers are supported.
The saving of scene values using the extension object is only available if the save function has been enabled in the configuration software in the parameter branch of the scenes for the global settings.

During the definition in the configuration software, scenes (1...24) are assigned to one or more scene function(s) (1...32). The scene commands are transmitted via the communication objects of the scene functions. KNX actuators receive these commands and activate lighting and shading systems depending on the situation. When recalling a scene, the device transmits a telegram with the defined scene command via the communication objects of the assigned scene functions.
Scene functions can be configured to the data formats "DPT 1.001 (1-bit switching)", "DPT 5.001...5.004 (1-byte value)" or "DPT 9.001...9.021 (2-byte value)". The display formats for representing the scene commands (switching or value) on the scene page (see page 132) can also be configured depending on the set data type.

If scene commands are to be changed during operation of the device, the memory function of the device can be used. For this purpose, the actuators must first be controlled by local operating functions or by other bus subscribers via the KNX (e. g. push-button sensors) in such a way that the desired scene states (brightness values or blind/shutter heights) are set. After that, the memory function of a scene can be executed. For this purpose, the device transmits a read request to the activated actuator communication object and awaits the responses ("Read"-flags must be set for the actuator objects!). If the activated KNX actuators return a state, the scene function saves the returned switching state or value in the non-volatile memory and thus replaces the old scene command of the corresponding scene function. If actuators do not return individual states to the device, the original scene commands remain unchanged in the device.

i The recalling of scenes can quickly cause a higher bus load especially if many functions were assigned to a scene. To avoid an excessive bus load, a time delay can be configured between scene telegrams (50...500 ms) in the parameter branch of the scenes for the global scene settings.
The transmission of telegrams in the course of the storage function always takes place immediately.

The configuration of the scene function in the configuration software consists primarily of two steps...

- creating and defining all necessary scenes functions (1...32) incl. presetting of the scene commands (see page 130).
- creating and defining all necessary scenes (1...24) incl. assignment to the scene functions (see page 130-131).

After commissioning the device, the preset scene names and scene commands can be changed directly on the panel. The submenu "Edit scene" in the "System" menu is available for this purpose.

i When scene names or commands are changed directly on the device by the user, the following should be observed:
User settings are saved in the non-volatile memory. Any changes made to scene names or scene commands by the user directly on the device are preserved after a device reset (e.g. due to mains voltage return). The user presettings are preserved even after a programming operation of the device if scene settings in the configuration software were not significantly changed.
If, however, elementary scene settings were changed in the configuration software, user settings for scenes will be lost after a programming operation! User settings are then overwritten by the presettings of the configuration software as a result of the commissioning operation. The following settings in the configuration software reset user settings...
- Changes to the data types of scene functions
- Addition or removal of scene functions for individual scenes
- Restrictions of value limits (Minimum, Maximum)

i Application example 1 (using two group addresses per scene output) of a scene recall via brightness values (1-byte) with storage function:
In this example, the 1-byte scene output object of the device is to be linked to the objects "Brightness value" and "Feedback brightness value" of a dimmer actuator via a group address (here e. g. 1/1/1). It should be noted here that this group address for the actuator object "Feedback brightness value" is configured exclusively as a hearing address. The transmitting address of this object must be another group address (here e.g. 1/1/2), which can also be used for the feedback of the lighting brightness value to other bus devices.
In this example, it is necessary to also link this second and transmitting address of the brightness value feedback (as a hearing address) to the 1-byte scene output object of the device. In this way, the scene function of the device will receive the current brightness value of the dimmer actuator if a value is requested and can save this with a scene save command.
The "Read" flag must be set on the actuator object "Feedback brightness value" so that the scene storage function can be executed correctly. The actuator must always track the current brightness value in the feedback object. The "Read" flag must not be set on the actuator object "Brightness value".

i Application example 2 (using only one group address per scene output) of a scene recall via brightness values (1-byte) with storage function:
This example illustrates the configuration of a scene storage function with only one group address. The configuration variant described can only be used with dimmer actuators characterised by special feedback behaviour or are configurable (feedback telegram only if brightness value changes). In case of doubt or with actuators that transmit a feedback telegram for every update of the input value, application example 1 (two group addresses per scene output) should be used!
In this example, the 1-byte scene output object of the device is to be linked to the objects "Brightness value" and "Feedback brightness value" of a dimmer actuator via a group address (here e. g. 1/1/1). The group address must be the transmitting address for the actuator object "Feedback brightness value" and scene output. In this example, it is necessary to configure the actuator so this it only tracks the brightness value feedback if there is an actual change of the feedback value in the feedback object and only then transmits a feedback telegram to the bus!
In this application example, the feedback of the actuator is traced back to its input object. If supplementary functions are used with the actuator, there is therefore a possibility that not all brightness states can be traced back to old presettings via the input object. If supplementary functions are used, which provide for the tracking of old brightness statuses in the configuration (e.g. actuator disabling function), this application example should not be used (Alternative: Example 1).
The "Read" flag must be set on the actuator object "Feedback brightness value" so that the scene storage function can be executed correctly. The actuator must always track the current brightness value in the feedback object. The "Read" flag must not be set on the actuator object "Brightness value".

### 4.2.4.6.2 Creating and defining scene functions and scenes

**Creating and defining scene functions**

The scene commands are transmitted to the bus via the scene functions. KNX actuators receive these commands and activate lighting or shading systems depending on the situation. Up to 32 different scene functions can be created in the configuration software. Before the actual scenes can be defined, the required number of scene functions (equivalent to actuator group) must be created and configured.

The configuration of the scenes can be accessed via the project bar in the configuration software by clicking on the entry "Scene function". Afterwards, scene functions can be added in the structure view. After adding the scene functions, they should immediately be given clear names for additional clarity and identification (e.g. "ceiling luminaires", "wall luminaires"). The names can be edited by a soft click.

i Scene functions can be deleted in the structure view and thus removed from the scene function. It should be noted here that assignments to scenes and user settings (after commissioning) will be lost!

One "function object" is available for each scene function in the configuration software. A group address must be linked to each of these objects, which must also be linked to actuators on the KNX side. The data format of a scene function, and thus of the corresponding function object, can be configured to the data formats "DPT 1.001 (1-bit switching)", "DPT 5.001...5.004 (1-byte value)" or "DPT 9.001...9.021 (2-byte value)". Depending upon this, additional parameters for a scene function become visible in the configuration software, which define the display format for value commands (unit, offset, factor, number of digits before and after the decimal point), the settable value range (minimum and maximum) or display formats (image texts and symbols) for switching commands.

i The transmission of scene commands via the function objects can quickly cause a higher bus load especially if many functions were assigned to a scene. To avoid an excessive bus load, a time delay can be configured between scene telegrams (50...500 ms) in the parameter branch of the light scenes for the global light scene settings.
The transmission of telegrams in the course of the storage function always takes place immediately.

**Creating and defining scenes**

After creating and defining all necessary scene functions in the configuration software, the actual scenes can be created and configured. During the course of the configuration, any number of the existing scene functions (1...32) are assigned to the individual scenes for which individual scene commands can then be configured ("ON", "OFF", brightness values etc.). This makes the activation of KNX actuator groups then possible.

The configuration of the scenes can be accessed via the project bar in the configuration software by clicking on the entry "Scenes". Afterwards, up to 24 scenes can be added in the structure view. After adding the scenes, they should immediately be given clear names for additional clarity and identification (e.g. "Scene TV", "Scene dining", "Scene guest"). The names can be edited by a soft click.
The user can change scene names on the device later after commissioning if this was enabled (activate parameter "Allow adaptation of the scene by the user").

i On adding, the light scenes receive their light scene number automatically, with which they can be opened later using the extension object.

i Scenes can be deleted in the structure view and thus removed from the scene function. It should be noted here that the user settings will be lost after commissioning!

It is possible to assign scene functions to a scene in the work area of the configuration software. To do this, a scene must first be selected in the structure view by mouse click. After that, all scene functions or just a individual scene functions can be selected and assigned to the scene.

Scene functions that have already been assigned appear in list form in the work area. Functions assignments can subsequently be changed by clicking on the name of the scene functions.

i Assignments of scene functions to scenes can be deleted in the work area. It should be noted here that the user settings will be lost after commissioning!

The actual scene commands can be defined during the further course of the scene function configuration. The commands which can be edited here align themselves to the set data and display format of the individual scene functions.
Lastly, you can define whether the function in a scene recall or scene storage function is active or not for each scene function contained in a scene. Telegrams are transmitted via the function objects when recalling a scene or saving only for scene functions that are set to "active" in the corresponding scene. Inactive scene functions behave passively (no telegram transmission).

i The characteristics of scenes, whether the scene functions contained are active or passive, can be changed on the device later at any time after commissioning. This means that the user can hide individual actuator groups from scenes or add them to scenes as required.

Scenes are created and predefined as described in the configuration software. After commissioning the device, the user can change the preset scene names and scene commands. The submenu "Edit scene" in the "System" menu is available for this purpose.
In the configuration software you can define whether or not it should be possible to change scenes on the device. For this purpose, the parameter "Allow adaptation of the scene by the user" is available per scene. If this parameter is not set, the scene concerned cannot be edited via the scene page.

### 4.2.4.6.3 Configuration of scenes directly on the device

After commissioning, scene commands can be edited directly on the device - by the installation engineer or by the user. In addition the light scene names can be modified. This requires that editing and modification of the scene characteristics is permitted. A parameter is available per scene in the configuration software for this purpose (see page 130-131).
Editing of scene commands and scene names - if allowed - is possible in the "System" menu, "Edit scene" submenu.

As soon as the "Scene" menu is opened, a list of all scenes created in the device will be displayed. Up to 8 scenes are displayed simultaneously. If more than 8 scenes have been created, the list can be switched by the sensor surfaces ▲ / ▼.

Scenes can be edited and adapted via the "Edit scenes" menu if this was enabled in the configuration software. If scenes are not adaptable, no submenu will open after clicking on these scenes.

The submenu with the functions "Rename scene", "Execute scene", "Learn scene" and "Edit scene" is recalled by touching any adaptable scene. With "Rename scene" the user can change the predefined scene names in the configuration software at any time.
In the editing mode, an on-screen keyboard is displayed. After entering the desired name using the keyboard, the new name is saved in the device memory by pressing the "OK" surface. By pressing the "ESC" surface the system returns to the screen page without saving the name that was entered. In this case, the original scene name remains unchanged.


Figure 51: Example of Edit scenes submenu

If you touch the sensor surface of an adaptable scene with your finger, the device branches to the submenu of the scene submenu. There, the display will show the possible executable functions "Rename scene", "Execute scene", "Learn scene" and "Edit scene", which in turn can be executed by touching them.


Figure 52: Example of a scene with "Scene TV" scene submenu

Scene recall or scene storage function in the scene submenu

After pressing the control surface "Execute scene", the device immediately recalls the corresponding scene. Such an operation is comparable with recalling an internal scene via the KNX operating function "Scene recall" (see page 89).

If the "Learn scene" control surface is pressed, a dialog query appears. After confirming with "OK", the device executes the storage function of the selected scene. At the same time, all assigned scene functions poll the current switching states or values as quickly as possible via their function objects in the actuator groups (ValueRead). After that, the actuators have to return the current state or value per scene function (ValueResponse). To make this possible, the "Read" flag on one actuator each of the different actuator groups must be set to the activated communication object!

The light scene function waits for a feedback of the different switching states or values in a defined time window. This waiting time depends on the number of assigned scene functions (max. 7 seconds). After the waiting time has elapsed, the device saves all returned states or values in the non-volatile memory and thus replaces the old scene commands by the new presettings. If actuator groups have not given any feedback to the device, the old switching or value commands remain unchanged for the scene functions concerned.

Adapting scenes in the scene submenu

If you touch the sensor surface "Edit scene" with your finger, a dialog window will open in which a new scene value can be specified directly. After confirming with "OK", the new value is saved. The representation of the configuration menu depends on the set data type of the scene function.

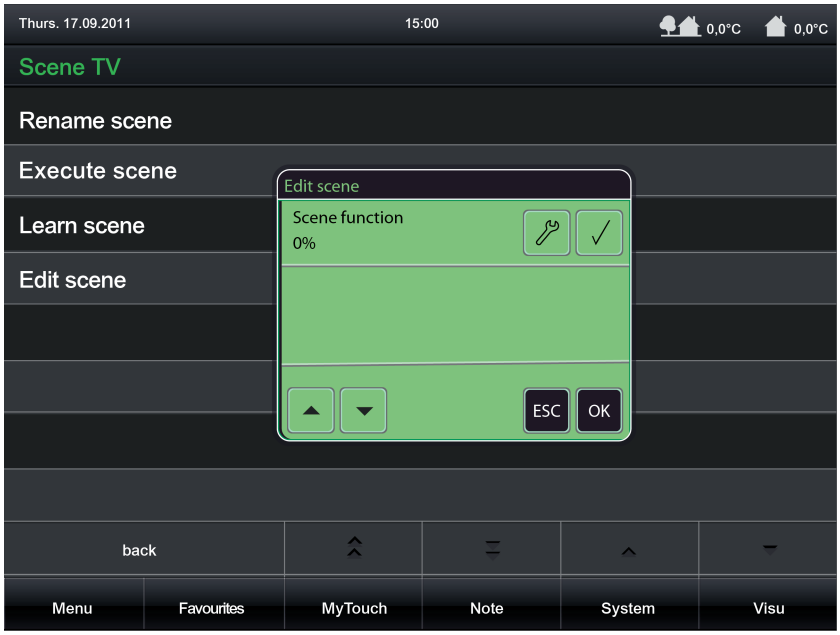


Figure 53: Example of a scene with "Edit scene" scene submenu

The light scene commands set on the device are saved in the non-volatile memory and are thus not lost if the power supply fails. When changing scene commands directly on the device, the following should be observed:
Any changes made to scene names or scene commands are preserved after a device reset (e.g. due to mains voltage return). The user presettings are preserved even after a programming operation of the device if scene settings in the configuration software were not significantly changed.
If, however, elementary scene settings were changed in the configuration software, user settings for scenes will be lost after a programming operation! User settings are then overwritten by the presettings of the configuration software as a result of the commissioning operation. The following settings in the configuration software reset user settings...
- Changes to the data types of scene functions
- Addition or removal of scene functions for individual scenes
- Restrictions of value limits (Minimum, Maximum)

You can define whether the function in a scene recall or scene storage function is active or not for each scene function contained in a scene. Telegrams are transmitted via the function objects when recalling a scene or saving only for scene functions that are set to "active" in the corresponding scene. Inactive scene functions behave passively (no telegram transmission).

### 4.2.4.7 Timer switch function

#### 4.2.4.7.1 Definition and function

The device has an integrated multichannel weekly timer. The timer supports up to 64 switching channels with a total of 128 switching times that can be distributed individually to the channels. The switching times directly affect the communication objects of the individual channels, and if necessary, can handle the data formats "switching 1-bit" (DPT 1.xxx), "Operating mode switchover 4 x 1-bit", "Operating mode switchover KNX", "Scene" (for recalling an internal scene), "Value 1-byte" (DPT 5.001, 5.010. 6.010), "Value 2-byte" (DPT 9.001...9.021, 8.001, 7.001) and "Value 4-byte" (DPT 14,000...14,079, 13,001, 12,001).
Additionally, it is possible to also activate a random function (see page 138) and an astro function (see page 137-138) for brightness-dependent lighting or shading control in the morning or evening twilight for each switching time.

Switching times can be configured down to the minute. Weekdays can be freely specified for each switching time. The set weekdays specify on which days of a calendar week the timer commands are to be executed. A switching time thus consists of the time of day and weekday information.
At each minute mark - possibly offset by a few seconds - the timer checks the set switching times. If a switching time corresponds to the current time (check for hours and minutes) as well as the current weekday, the preset switching time command is executed. Different switching time commands (e.g. switching a lighting system on and off) require various switching times.
If several switching times with an identical configuration (the same time and weekday) are allocated to a timer switching channel, the switching time command of the last switching time will always be executed.

The timer is controlled by the device's internal system clock (time and date of the operating system). Consequently, a valid time and current date must be preset for the correct execution of the switching times. The system clock can be set directly in the operating system (also per IP via SNTP) via the communication objects "Time" (KNX DPT 10.001) and "Date" (KNX DPT 11.001) or via the user and system settings directly on the device.

- The real time clock has a calendar function. Depending on the date set, the day is determined automatically by means of the internal calendar which is necessary for processing the timer. The day transmitted in the KNX time telegram in compliance with DPT 10.001 is irrelevant and is discarded by the device.
- The device's internal system clock is designed as a real time clock (RTC) and has an accuracy of approx. +/- 2 seconds per day. It is advisable to set the system clocks of all devices once a day, for example, by a shared KNX time telegram during the night hours, so that that the timing of all devices is synchronized even over a long period of time.
  The system clock has its own energy storage. This will ensure that the clock keeps on running interruption-free for at least 24 hours if the mains power supply fails.

When the internal clock is resynchronised, a distinction is to be made between two cases...

- The clock is moved back to a time before an already executed switching time. In this case, the programmed command is not executed again when the switching time occurs. The device waits for the next switching time if there are more.
- The clock is moved forward to a time after an as yet unexecuted switching time. In this case, the last programmed command of the channel is carried out.

i The timer remains active even when the device is switched off (operating system has been shut down) or is in standby mode (see page 186). The KNX function part (BCU) is functional as long as mains voltage and bus voltage are switched on.
In the event of a bus voltage failure, the timer cannot transmit any telegrams. After bus voltage return, the timer checks whether switching times would have had to be carried out recently. If this is the case, the last programmed command is carried out for the affected channels.

The KNX function part executes the timer commands independently. To ensure that it can also do this, the KNX function part needs regular information regarding the switching times that were last programmed by the installation engineer or user when the operating system and thus the KNX application are in standby mode. The KNX function part can temporarily store and execute the switching times every 24 hours. If the temporarily stored switching times have been executed, the KNX function part must be resynchronised with switching times.
The synchronisation takes place cyclically depending on the time of day, or when the KNX module has executed all switching times in one day. In the configuration software for the global timer parameters, you can define at what time of day the recurrent synchronisation should take place. The parameter "Time for synchronisation of the switching times" defines the time for the synchronisation process regardless of whether or not the KNX module still has switching times. In addition, the KNX module requests switching times automatically if it has executed all switching times in one day.
The synchronisation process takes a short time. In addition, the device is reactivated from the standby mode should this be necessary. To ensure that the reactivation and synchronisation of the device does not disturb the user, a time of day that is outside of the normal times of use should be specified in the parameter for cyclical synchronisation.

i The device cannot be reactivated automatically for the synchronisation if it was switched off by the user (operating system shut down). In this case, the synchronisation of the KNX function part remains off. The KNX function part will then continue to work with the old switching times until a new synchronisation is carried out.

The configuration of the timer switch function in the configuration software consists primarily of two steps...

- Creation and definition of all necessary timer switch channels (1...64) (see page 139-140).
- Configuration of all necessary switching times (1...128) in the individual timer switch channels (see page 140-141).

After commissioning the device, the preset switching times can be changed directly on the panel. The sensor surface for operating the timer is available for this purpose. The dialog window will open by touching the sensor surface "Timer".

### 4.2.4.7.2 Astro and random function

**Astro function**

The astro function allows the control of a lighting or shading system depending on sunrise and sunset as well as a limit time. The astro function can be activated separately for each switching time.
The device calculates the time of the sunrise and sunset (astro time) automatically according to the local geographic position (geographic co-ordinates). The setting of the co-ordinates is the precondition for correct functioning and is carried out in the parameter node of the global timer parameters. This applies in the same way to all the timer switch channels.

When the astro function is activated, the time set in the configuration software or directly on the device is used as the limit time. Whether the limit time affects sunrise or sunset is evaluated by the device according to the set time. Times between 00:00 and 11:59 are evaluated as sunrise and times between 12:00 and 23:59 as sunset.
An astro function usually affects lighting (e.g. exterior lighting) or shading (e.g. roller shutters). The behaviour of the device when processing the astro switching times varies according to these applications. The parameter "Astro: Channel affects" in the parameters of a timer switch channel defines the astro behaviour - regardless of the data format of the communication objects of the channel - as follows...

- "Lighting" setting:
  Sunrise (switching times 00:00 - 11:59): if sunrise occurs before the set time (for example in the summer months), then, at sunrise, the switching time command (e.g. external lighting OFF) is sent to the bus. If sunrise occurs later (for example during the winter months), then the switching time command is sent to the bus at the set time at the latest. When a switching time is set in the configuration software, the appropriate time is indicated with "At the latest...".
  Sunset (switching times 12:00 - 23:59): if sunset occurs after the set time (for example in the summer months), then the switching time command (e.g. external lighting ON) is sent to the bus at sunset. If sunset occurs earlier (for example during the winter months), then the switching time command is sent to the bus at the set time at the latest. When a switching time is set in the configuration software, the appropriate time is indicated with "At the latest...".

- "Shading" setting:
  Sunrise (switching times 00:00 - 11:59): if sunrise occurs after the set time (for example in the winter months), then the switching time command (e.g. roller shutters UP) is only sent to the bus at sunrise. If sunrise occurs earlier (for example during the summer months), the switching time command is first transmitted to the bus at the set time. When a switching time is set in the configuration software, the appropriate time is indicated with "At the latest...".
  Sunset (switching times 12:00 - 23:59): if sunset occurs before the set time (for example in the winter months), then the switching time command (e.g. roller shutter DOWN) is sent directly to the bus at sunset. If sunset occurs later (for example during the summer months), then the switching time command is sent to the bus at the set time at the latest. When a switching time is set in the configuration software, the appropriate time is indicated with "At the latest...".

Optionally, the astro time for the morning and evening determined by the device can be statically shifted in the minute range (-120...0...+120). Thus, the switching times influenced by astro can be individually adapted to local conditions (e.g. influence by high mountains or forests). In the configuration software the astro shift is defined for a timer switch channel by a parameter "Astro: Offset morning " and "Astro: Offset evening".

- Depending on the geographic position of the location, the astro times for sunrise and sunset will vary by several hours. If a switching time with an active astro function affects another switching time of the timer switch channel, then the astro function is not executed. Example: a switching time is set to 17:00, astro function active (seasonal sunset between 16:00 and 22:00), an additional switching time is set to 19:00 -> In this case, the second time (19:00) would be affected by the astro function, meaning that it would be deactivated for the affected switching time(s). The same would apply, if both switching times in the example had the astro function active.
- The default coordinates are set for Kassel.

**Random function**

The switching times of a channel can be triggered offset in a set random period. The random function can be activated separately for each timer switch channel and affects all the switching times of the appropriate channel.
Each day at 00:00, the device calculates a time offset individually and randomly for each switching time, by which a switching time is brought forward minute-by-minute (-) or is set back (+). The maximum time offset between the set switching time and the actual time of the version can be configured in the configuration software for each timer switch channel using the parameter "Random: max time offset". This allows time offsets of between 1 and 30 minutes. The setting "0" for the time offset completely deactivates the random function for the timer switch channel. The device randomly determines a time from the configured maximum time offset and adds this time either to the set switching time or, alternatively, subtracts it from the switching time.

- It is not possible to transfer the switching times into the previous or next day using the time offset, i.e. the random function does not extended beyond the ends of days. If a randomly calculated time offset of a switching time go beyond the end of a day, then the random function for the affected switching time is not executed. The same applies when the random time offset affects other switching times in the timer switch channel. When using the random function to specify the switching times of a channel, care should be taken to ensure that the individual switching times are apart by at least +/- the maximum time offset, as configured in the configuration software.
  Example: maximum time offset = +/- 30 minutes, one switching time set to 11:00, random function active -> other switching times of the channel may be between 00:00 ... 10:30 and 11:30 ... 23:59. The same applies to additional switching times with a random function.
- If, in addition to the random function, an astro function is also activated, then the following prioritisation applies to the calculation of the switching time:
  1. Astro time complying with "Not before..." / "At the latest..."
  2. The random time is added or subtracted to the time calculated under 1.

### 4.2.4.7.3 Creating and defining timer switch channels and switching times

**Creating and defining timer switch channels**

The commands of the switching times are transmitted to the bus via the communication objects of the timer switch channels. KNX actuators receive these commands and activate, for example, lighting or shading systems time-controlled. Up to 64 different timer switch channels can be created in the configuration software. The switching times are configured during the definition of the individual timer switch channels.

The configuration of the timer switch channels can be accessed via the project bar in the configuration software by clicking on the entry "Timer". Afterwards, timer switch channels can be added in the structure view. After adding the timer switch channels, they should immediately be given clear names for additional clarity and identification (e.g. "external lighting", "move venetian blinds"). The names can be edited by a soft click.

i Timer switch channels can be deleted in the structure view and thus removed from the timer. It should be noted here that the user settings on switching times (after commissioning) will be lost!

One communication object is available for each timer switch channel in the configuration software. A group address must be linked to each of these objects, which must also be linked to actuators on the KNX side. The data format of a timer switch channel and thus the corresponding object can be configured alternatively to "Switching", "Operating mode switchover" (4 x 1-bit or KNX)", "Scene" or to value formats (1-byte, 2-byte, 4-byte with different formats and value ranges). Depending upon this, additional parameters for a timer switch channel become visible in the configuration software, which define the display format for value commands (unit, offset, factor, number of digits before and after the decimal point), the adjustable value range (minimum and maximum) or display formats (image texts and symbols).

| Data type | Status elements | Value range |
|---|---|---|
| Switching | Image text | "0" (OFF) / "1" (ON) |
| Operating mode switchover 4 x 1 bit | Image texts | Comfort, Standby, Night operation, Night reduction, Frost/heat protection |
| Operating mode switchover KNX | Image texts | Automatic, Comfort, Standby, Night operation, Night reduction, Frost/heat protection |
| Scene | Scene name | internal scenes |
| 1-byte value (5.00x) | Status value (formatted) | %: 0...100<br>°: 0...360<br>user-defined: 0...255 |
| 1-byte value (5.010) | Status value (formatted) | 0...255 |
| 1-byte value (6.010) | Status value (formatted) | -128...127 |
| 2-byte value (7.001) | Status value (formatted) | 0...65535 |
| 2-byte value (8.001) | Status value (formatted) | -32768...32767 |
| 2-byte value (9.0xx) | Status value (formatted) | -671089...670761 |
| 4-byte value (12.001) | Status value (formatted) | 0...4294967295 |

| | | |
|---|---|---|
| 4-byte value (13.001) | Status value (formatted) | -2147483648...2147483647 |
| 4-byte value (14.0xx) | Status value (formatted) | -214748365...214748365 |

Configurable data types and status elements for timer switch channels

i The value ranges of the value data types can be limited by parameters in the configuration software.

i With the data type "Scene", internal scenes are recalled via the switching times. For this purpose, at least one internal scene must have been created in the device!

A disabling object is optionally available for every timer switch channel. Timer switch channels can be locked via the disabling objects during the running time of the device. In these cases, the objects of the timer switch channels do not transmit when a switching time occurs. The telegram polarity of the individual disabling objects (which telegram is disabled or enabled) can be configured on the parameter page of a timer switch channel.
If the parameter "Transmit after disabling is enabled" is set, the device evaluates the configured switching times upon re-enabling. If one or more switching times were not executed during the previously active disable phase, the device carries out the execution of the last switching time and transmits a corresponding telegram to the bus via the communication object of the timer switch channel. If the parameter "Transmit after disabling is enabled" is not set, the switching times will be ignored upon re-enabling. In this case, switching times skipped by the disabling function are not carried out.

**Defining switching times**

After creating and defining all necessary timer switch channels in the configuration software, the actual switching times can be created and defined. Switching times are created and defined for a timer switch channel in its parameter structure in the work area of the configuration software. It is possible to add switching times - if a timer switch channel was selected - in the work area of the configuration software. Up to 128 switching times can be created in the entire device, which are distributed to the individual timer switch channels. At least one switching time should be created for each timer switch channel.

A switching time has the following parameters...

- Parameter field "Value": This parameter defines the value of the switching time. The adjustable value depends on the configured data format of the corresponding timer switch channel.
- Parameter fields of the weekdays: The weekdays on which the switching time event is to take place are defined here.
- Parameter field "Switching time": The actual switching time is defined here. The setting is made in the 24-hour format.
- Parameter field "Astro": The presetting whether the astro function is activated for the switching time is made here. The astro function can be activated individually for each switching time. The function of the astro function and its optional time offset are defined in the parameters of the corresponding timer switch channel.
- Parameter field "Random": This parameter is used to preset whether the random function is activated for the switching time. The random function can be activated individually for each switching time. The maximum time offset for the random function is defined in the parameters of the corresponding timer switch channel.

When switching times are changed directly on the device by the user, the following should be observed:
User settings are saved in the non-volatile memory. Any changes made by the user directly on the device are preserved after a device reset (e.g. due to mains voltage return). The user presettings are preserved even after a programming operation of the device if settings for timer switch channels or switching times in the configuration software were not significantly changed.
If, however, elementary settings were changed in the configuration software, user settings for timer switch channels will be lost after a programming operation! User settings are then overwritten by the presettings of the configuration software as a result of the commissioning operation. The following settings in the configuration software reset user settings...
- Changes to the data types of timer switch channels
- Addition or removal of switching times for timer switch channels
- Restrictions of value limits (Minimum, Maximum)

**Assigning timer switching channel to a function**

Timer switching channels created in the configuration software must be assigned to any function during commissioning on the device. Only then will these functions be executed at the configured switching times.
For this purpose, the timer switching channel desired must be selected in the chosen function under "Display - timer switching channel".
If no switching times have been programmed yet in the configuration software, a white clock symbol will appear in the display to indicate an incomplete setup. If switching times have been programmed, the clock symbol will be green.

### 4.2.4.7.4 Direct configuration of switching times

After commissioning, - by the installation engineer or by the user - switching times of the timer can be edited or created directly on the device. It is possible to edit and create the switching times via the sensor surfaces for operating the timer if the function was assigned to a timer switching channel.

As soon as the sensor surface is touched for operating the timer, the dialog window will appear for activating/deactivating the timer and for changing existing and creating new events. A maximum of 2 channels are displayed simultaneously. If more than 2 channels have been created, the list can be switched by the sensor surfaces ▲ / ▼.

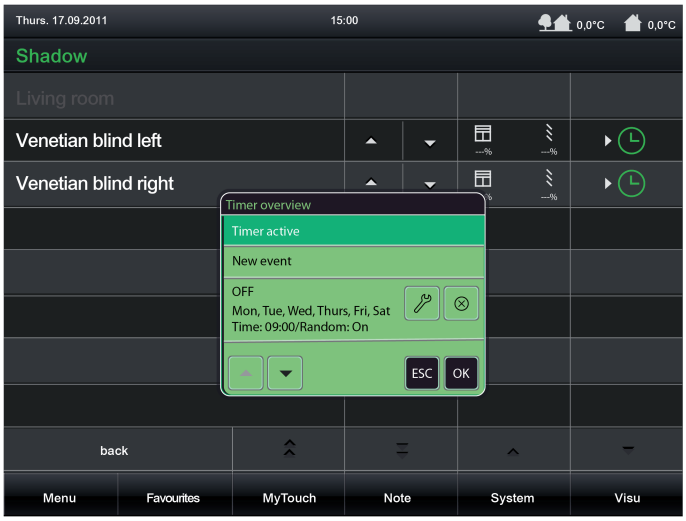


Figure 54: Example of a timer switch page (overview)

An additional switching time can be added to the timer switch channel by pressing the control surface "New event".

With the sensor surfaces ▲ / ▼ the desired event of a timer switching channel is displayed. All switching times assigned to the timer switch channel appear in the display. Another dialog window is opened by touching the wrench symbol. All necessary settings can be made here.

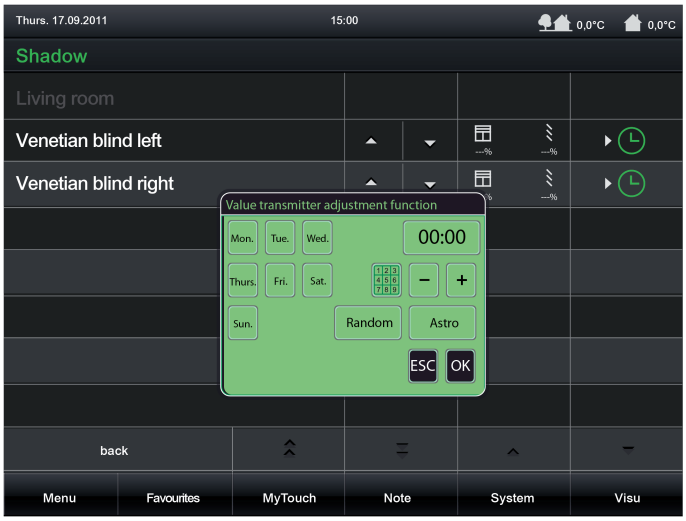


Figure 55: Example of a timer switch page (Setting)

Once the time, weekday as well as astro and random function have been set as required, the last dialog window for setting the timer action will open. The representation of the dialog window depends on the set data type of the timer switching channel.

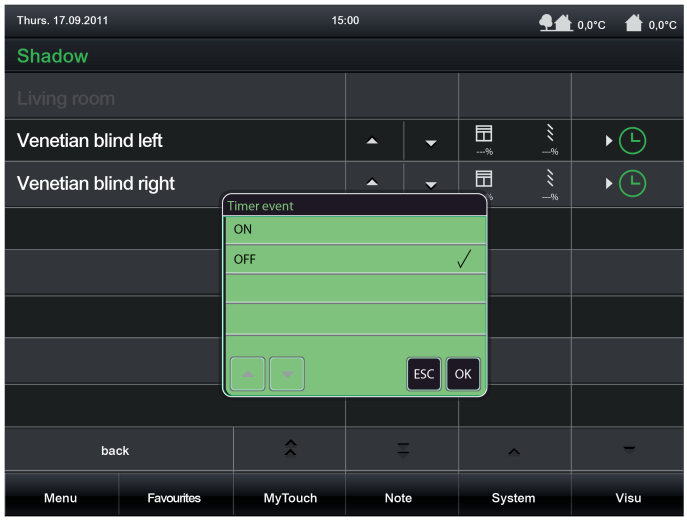


Figure 56: Example of the Action dialog window
Data type timer switch channel "Switching"

When changing the command of the switching time via the keyboard, the change must be acknowledged and saved in the device memory.

When switching times are changed directly on the device by the user, the following should be observed:
User settings are saved in the non-volatile memory. Any changes made by the user directly on the device are preserved after a device reset (e.g. due to mains voltage return). The user presettings are preserved even after a programming operation of the device if settings for timer switch channels or switching times in the configuration software were not significantly changed.
If, however, elementary settings were changed in the configuration software, user settings for timer switch channels will be lost after a programming operation! User settings are then overwritten by the presettings of the configuration software as a result of the commissioning operation. The following settings in the configuration software reset user settings...
- Changes to the data types of timer switch channels
- Addition or removal of switching times for timer switch channels
- Restrictions of value limits (Minimum, Maximum)

You can define whether the function is active or not for each switching time. Only switching times that are set to "active" are processed by the device. Inactive switching times behave passively (no telegram transmission).

### 4.2.4.8 Logical links

The device makes it possible to create and evaluate up to 80 logical link functions with up to 8 inputs and one link output the running time of the device. Inputs and outputs are executed as communication objects that can be linked to internal or external group addresses.
To add the configuration of an operation function, the node "Logic Editor" must be selected in the configuration software in the project bar. In the structure view it is then possible to add and configure logic gates. Each logic gate is given a name in the configuration software for added clarity, which can be changed by double clicking on the node in the structure view.

A logic gate consists of up to eight 1-bit input objects (E1...E8), which can be added by a mouse click, a 1-bit output object (A) and an optional disabling object. For each logic gate, the parameter "Link" can be used to select one of the logical functions AND, OR, exclusive OR or AND with return. Inputs and the output of a logic gate can optionally be evaluated inversely.

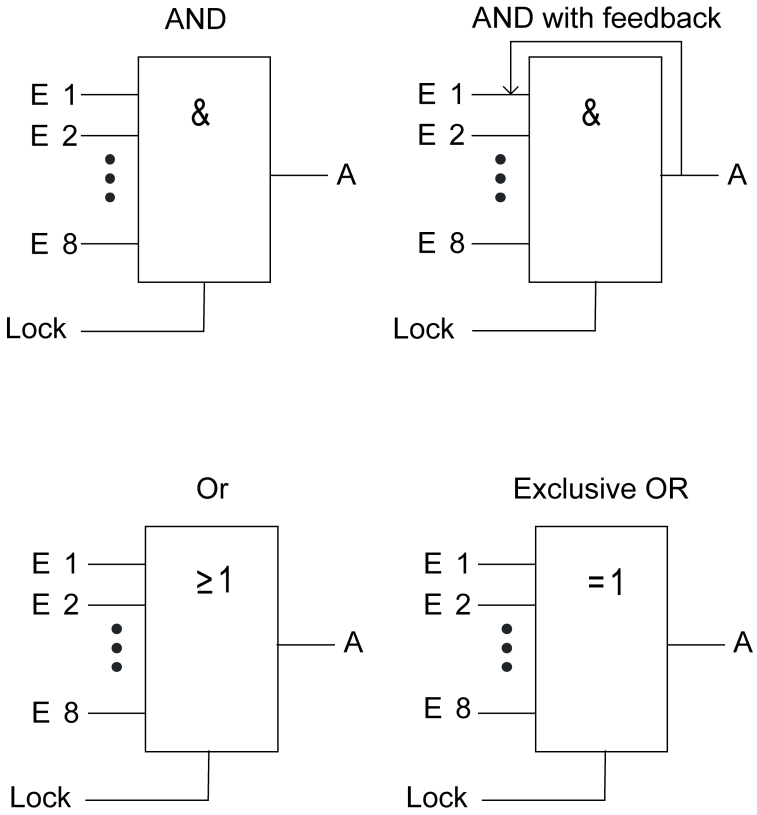


Figure 57: Link functions

i With an "AND with return" the value of the output is fed back internally to input 1. The result of this is that the output can only be given the value "1" again if input 1 is set to "1" after the value "1" is also present on all of the other inputs. As soon as one of the other inputs is given the value "0", the output and thus input 1 are set to "0". If the return is carried out with an inverted output, the inversion is only processed after the return. Example: One application for this type of logic operation a light that should only be switched on manually after twilight falls. Here the pushbutton is linked to input 1 and the limiting value of the twilight sensor is linked to input 2. After the twilight sensor has set input 2 to "1", the pushbutton on input 1 can be used to switch on the light. If the user forgets to switch the light off again manually, when daylight comes the feedback ensures that input 1 is reset internally to "0". Without this feedback the light would be switched on again automatically at the next twilight.

Taking an example of three inputs, the following output statuses would be produced without inversion of the input signals or the output, according to the set link function...

| E 1 | E 2 | E 3 | Output AND | Output OR | Output EX OR | Output AND with feedback |
|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 | 1 | 1 | 0 |
| 0 | 1 | 0 | 0 | 1 | 1 | 0 |
| 0 | 1 | 1 | 0 | 1 | 0 | 0 |
| 1 | 0 | 0 | 0 | 1 | 1 | 0 *) |
| 1 | 0 | 1 | 0 | 1 | 0 | 0 *) |
| 1 | 1 | 0 | 0 | 1 | 0 | 0 *) |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 |

Output statuses of the logical link functions

*): Input 1 is automatically reset to "0" here.

The transmission behaviours of the output of a gate can be influenced in different ways...

- The parameter "Transmit on" of a gate together with the "Change the output" setting can reduce the bus load. In this case, telegrams are only transmitted when the logical status of the output changes. If, for example, the result of the link in time-monitored in a roller venetian blind actuator, it may be advisable to have the output transmit a telegram on each input event ("Each input event" setting).
- The gate can be disabled or enabled using the optional 1 bit disabling object. It is possible to set for which object value the disabling is active. The transmission behaviour of the logic gate can be defined after the block has been enabled. If, during a block, the input value is changed, then the output can automatically send a telegram, as soon as the block is lifted, or the gate waits until the next input telegram.
- The output also possesses a filter function. This sets whether it transmits each output value or whether it can only send "1" telegrams or only "0" telegrams.
- A switch-on delay and switch-off delay can be configured if required. Depending on the set time, telegrams of the output are transmitted to the bus after a delay depending on the result of the logical link ("1"-telegram or "0"-telegram). This function is used for suppressing brief changes in the status. A change in the status is not transmitted to the bus if the status should change once again within a time delay.
- Optionally, the output of a logic gate can transmit the status cyclically to the bus (e.g. for telegram monitoring in actuators). An output only transmits cyclically if the filter criterion is met (see above) In the case of configured switch on / or switch off delays, the status of the cyclical telegram first changes after a logical change in status after the delay time has elapsed.

### 4.2.4.9 Demultiplexer

The device has an integrated demultiplexer function. A demultiplexer forwards the value of an input object to one of two (type "1 to 2") or one of four outputs (type "1 to 4"). The output used depends on the state of the 1-bit control inputs.
Up to 7 demultiplexer functions from type "1 to 2" and up to 7 demultiplexer functions from type "1 to 4" can be created in the configuration software in the project bar under "Logic Editor".
Each demultiplexer is given a name for added clarity, which can be edited by double clicking on the node in the structure view.

i The demultiplexer is purely a KNX function that does not become visible on the device on the graphic interface.

A demultiplexer supports the following data formats that can be set by the parameter "Object type Input/Output". Input and output objects always have the same data type...

- DPT 1.001 (switching, 1-bit)
- DPT 3.007 (Dimming 4-bit)
- DPT 5.001 … 5.004 (relative value 1-byte)
- DPT 5.010 (counter value, 1-byte)
- DPT 5.010 (counter value, 1-byte)
- DPT 6.010 (counter value with sign, 1-byte)
- DPT 7.001 (counter value, 2-byte)
- DPT 8.001 (counter value with sign, 2-byte)
- DPT 9.001...9.0021 (floating point value, 2-byte)
- DPT 12.001 (counter value, 4-byte)
- DPT 13.001 (counter value with sign, 4-byte)
- DPT 14.000 … 14.079 (IEEE float, 4-byte)

The following truth tables and figures describe the internal function of the multiplexers according to the type "1 to 2 demultiplexer" or "1 to 4 demultiplexer".

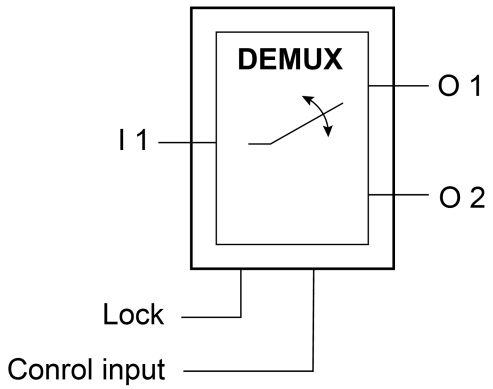


Figure 58: Demultiplexer "1 to 2"

| Control input | Forwarding to |
|---|---|
| 0 | Output 1 |
| 1 | Output 2 |

Selection of the output by control input for demultiplexer "1 to 2"

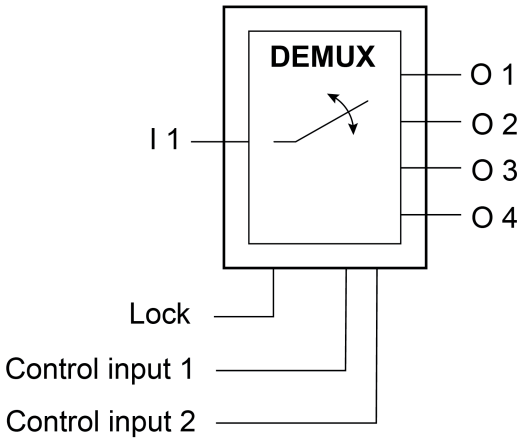


Figure 59: Demultiplexer "1 to 4"

| Control input 2 | Control input 1 | Forwarding to |
|---|---|---|
| 0 | 0 | Output 1 |
| 0 | 1 | Output 2 |
| 1 | 0 | Output 3 |
| 1 | 1 | Output 4 |

Selection of the output by control inputs for demultiplexer "1 to 4"

i When the control inputs change, the outputs do not transmit telegrams. Only when an input object receives a new value is it forwarded to the current output.

The demultiplexer can be blocked or enabled using the optional disabling object. It is possible to set for which object value the disabling is active. The behaviour can be defined after the block has been enabled. If the block is lifted, the output can automatically transmit a telegram or the demultiplexer waits until the next input telegram.

### 4.2.4.10 Timers

The device has the ability to create up to 40 timers. A timer allows the filtering of incoming 1 bit telegrams of a communication object, the delaying of switching statuses according to the switching edge and then forwarding via an output communication object. Both internal and external group addresses can be linked to the objects.
Timers can be added to the project design in the configuration software in the project bar under "Logic Editor". Each timer is given a name for added clarity, which can be edited by double clicking on the node in the structure view.

A timer consists of an input object, an output object and an optional disabling object. In the device software, the timer acts like a sluice with time delay and filter function. Depending on the value of the disabling object and the parameters, the value of the input object is either forwarded to the output object or is disabled.
The disabling object is a 1-bit communication object, whose behaviour (disable on 0, disable on 1) can be set in the parameters of a timer. If, during a block, the input value is changed, then the output can automatically send a telegram, as soon as the block is lifted, or it waits until the next input telegram.

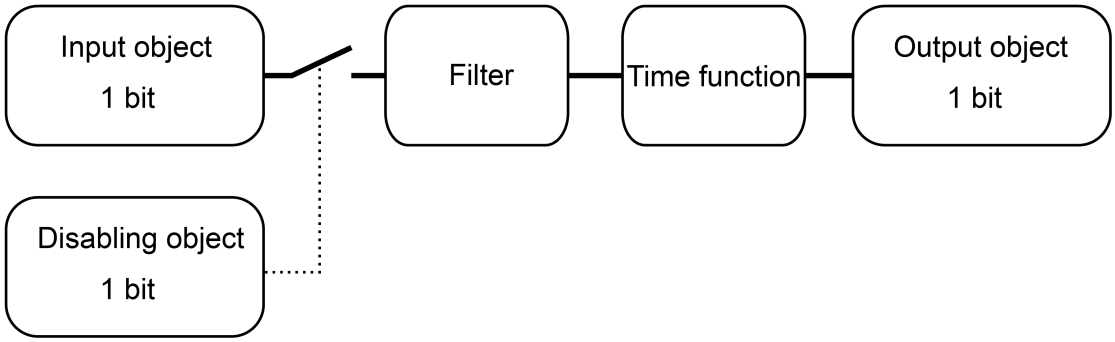


Figure 60: Elements of a timer

### 4.2.4.11 Limiting values

The device allows the limiting value monitoring of 1-byte, 2-byte and 4-byte values in different data formats. A maximum of 40 limiting value modules are available that can be created individually and configured in the configuration software under "Logic Editor" in the project bar. The limiting value modules have one value input object each. The value received via this object is compared continuously with the configured limiting values. Each limiting value module also has two limiting values each with 1-bit communication objects for monitoring a lower and upper limit. Alarm or message telegrams can be transmitted to the bus via these 1-bit objects if the lower or upper limiting value was fallen short of or was exceeded in each case.

A limiting value module has the following characteristics and parameters...

- "Datapoint type":
  This parameter defines the data format of the input communication object. Depending on this setting, other parameters are visible which define the display format and unit of the value for displaying the user settings directly on the device ("Settings -> Limiting values") and which also define the format of the input field of the limiting values in the configuration software.
- "Transmit limiting value on initialisation":
  If this parameter is set, the device evaluates the input value immediately after a device reset (commissioning operation or bus voltage return) and initialises the 1-bit limiting value objects. Consequently, the 1-bit limiting value objects also send the current state to the bus.
- "Upper limiting value active" and "Lower limiting value active":
  This parameter can define whether the input value is monitored at a lower and upper limit.
- "Upper limiting value" and "Lower limiting value":
  These parameters define the limiting value to be monitored if these are activated. The limiting values predefined here can be changed on the device at any time directly in the user and system settings and can therefore be adapted to individual needs or requirements. The formatting of the values in the input field of the configuration software and in the presetting during the course of the user settings directly on the device is defined by the lower level parameters of the data point type (offset, factor, format).
- "Hysteresis upper limiting value" and "Hysteresis lower limiting value":
  A hysteresis is assigned to each limiting value. The hysteresis serves to prevent frequent switching backwards and forwards when there is a measured value in the approximate area of the limiting value (Figure 62). The setting "0" deactivates the hysteresis (Figure 61). In the case of the upper limiting value, the hysteresis is deducted from the limiting value. In the case of the lower limiting value, the hysteresis is added to the limiting value. The hysteresis - like the limiting value itself - is an absolute value and is only defined in the configuration software.

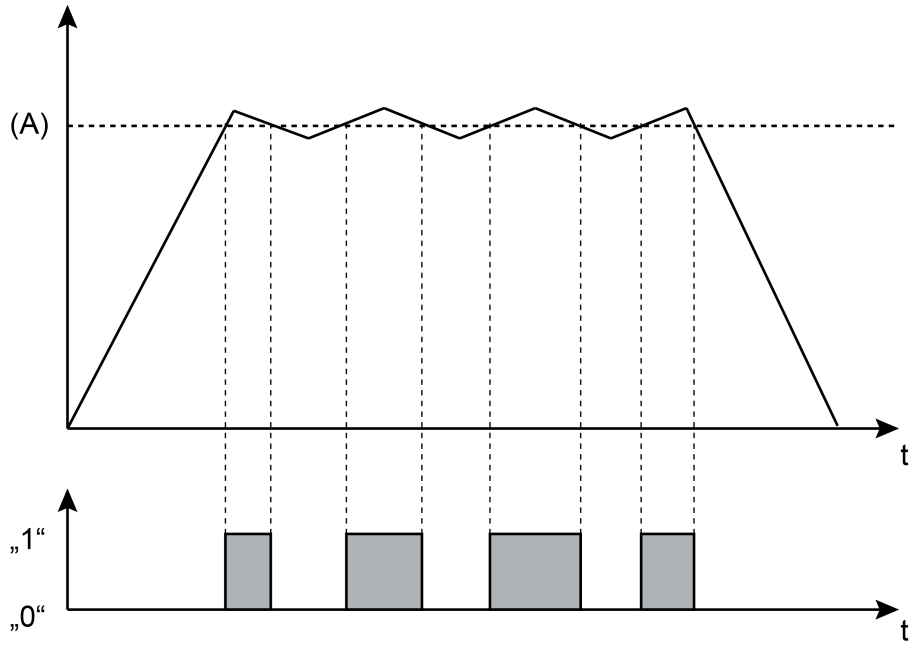


Figure 61: Example of a limiting value without hysteresis

(A) Limiting values that have been configured or set directly on the device

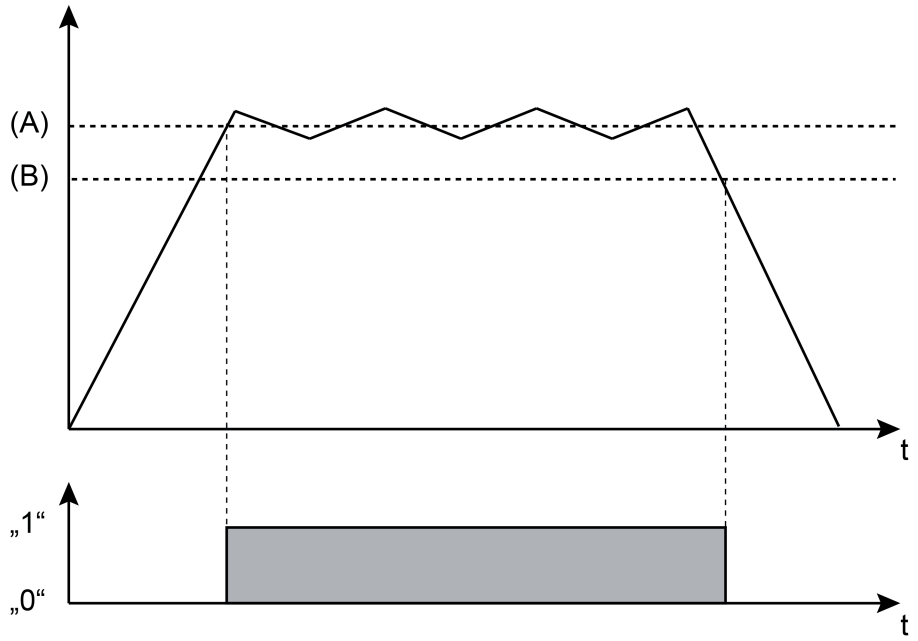


Figure 62: Example of a limiting value with hysteresis

(A) Limiting values that have been configured or set directly on the device (here: upper limiting value)
(B) Hysteresis

- "Behaviour on exceeding the upper limiting value", "Behaviour on not reaching upper limiting value – hysteresis", "Behaviour on not reaching lower limiting value", "Behaviour on exceeding upper limiting value + hysteresis":
  These parameters define the switching commands transmitted to the bus via the 1-bit limiting value object. The device compares the current input value continuously with the set limiting values and hystereses and decides on this basis which switching command should be transmitted.
- "Transmission delay upper limiting value" and "Transmission delay lower limiting value":
  The switching telegrams of the limiting value object can be transmitted to the bus after a delay if required. This function is used for suppressing brief changes in the status. A change in the status is not transmitted to the bus if the status should change once again within a time delay.
- "Upper limiting value changeable" and "Lower limiting value changeable":
  The limiting values can be changed directly on the device in the user and system settings and can therefore be adapted to individual needs or requirements. This is only possible, however, if the individual limiting values in the configuration software are configured as changeable here.
- "Upper limiting value changeable externally" and "Lower limiting value changeable externally":
  Limiting values can also be optionally changed externally via a communication object. If these parameters are set, communication objects are also available that can change the limiting values during the running time of the device. The data format of these objects corresponds to the datapoint type of the limiting value set in the configuration software.

### 4.2.4.12 e-mail

If the device is connected to a network via the Ethernet interface and the IP communication parameters are set correctly in the Windows® operating system, the E-Mail function can be used. e-mail is a service in computer networks allowing electronic messages to be exchanged between a sender and one or more recipients. Alongside the World Wide Web (www), e-mail is the most currently used service on the Internet.
The device is also able to send e-mail messages. To use this function, the device operator must have a valid e-mail account in a local network or the Internet. Most Internet Service Providers (ISP) usually offer their customers e-mail accounts.

The configuration of the e-mail accounts takes place directly on the device in the user and system settings (see page 110). In this way, the device operator can configure his e-mail account at any time and independently of the ETS or configuration software.

i The receipt of e-mails is triggered via a plug-in.

**Sending e-mail messages**

The device is able to send predefined texts as "event e-mail". The text contents of the event e-mail as well as the recipient address are specified in the configuration software by the project planner before the device is commissioned. Sending of texts is triggered by switching telegrams, which receive either KNX group addresses or internal group addresses.

The event mails are configured in the configuration software when the entry "E-Mail" is selected in the project bar. Up to 50 event e-mails can then be created in the structure view. A 1-bit communication object is shown for each event e-mail.

Within the parameters of an event e-mail, the project planner specifies the following properties...

- "Send e-mail on":
  Definition of the telegram polarity for the object of the corresponding event e-mail. The e-mail is sent when a telegram is received with the polarity defined at this point. Telegrams with another polarity are rejected.
- "Recipient":
  Specification of the e-mail address of a recipient of the event e-mail. The standard input format of the address is specified as "local@domain" (example: "xxx@yyy.de").
- "Subject":
  Specification of the subject text of the event e-mail (e.g. "Signalling system fault", "Heater frost protection", ...). The text may be a maximum of 20 characters in length.
- "Message":
  Specification of the text contents of the event e-mail. The specified contents text is later transmitted to the mail server as "simple text" (plain text) in the event e-mail, and is displayed in the same manner, without special formatting, when the message is opened.

To enable the device to send e-mails, a valid SMTP mail server (Simple Mail Transfer Protocol) must be entered in the device configuration. The SMTP configuration is possible with the general device parameters in the configuration software as well as later directly on the device in the user and system settings.

i After a device reset (return of mains power supply, commissioning operation), the device first initialises the Ethernet interface. e-mails can only be sent when this initialisation operation has been completed (if necessary using DHCP). After a device reset, this is usually possible after approx. 1 minute.

i The device encodes the text characters of an email message in Unicode (UTF-8).

**Sending the data values of the datalogger by e-mail message**

If a datalogger channel is configured in the configuration software, the recorded data values can be sent cyclically by e-mail. In this case, the device prepares the recorded data in CSV format

(values are separated by semicolons) and sends them to a specified recipient in a standard e-mail. Both the e-mail function and the recipient address can be configured in the configuration software with the parameters of a datalogger channel. The e-mail is sent automatically each time the number of data records stored in the file system reaches 10,000. A data record consists of the minimum value, maximum value, average value and the last value (for calculating a difference) of a time interval.

### 4.2.4.13 Datalogger

**Introduction**

The datalogger offers the option of recording KNX data - for example temperature values, command values, lighting status, etc. - in various formats in the device memory and of showing them in a value-time diagram on the display. In so doing, the data telegrams received from the KNX are "compressed" at set intervals and saved in a datalogger channel of the device as minimum and maximum average values and can be displayed as required. It is optionally possible to also represent average values of the recorded data values.
The datalogger is primarily subdivided into the function modules "Datalogger recording" and "Datalogger display".

### 4.2.4.13.1 Datalogger recording

The KNX data are saved in a datalogger channel. A maximum of 20 datalogger channels can be inserted in the device configuration by selecting the entry "Datalogger" in the configuration software in the project bar. Afterwards, new channels can be added in the structure view. Each datalogger is given a name for added clarity, which can be edited by a soft click on the node in the structure view.

Communication object and data format:
Each datalogger channel possesses a communication object. The data format of this object can be specified using the parameter "Data point type". The following data formats are available...

- DPT 5.001 … 5.004 (relative value 1-byte)
- DPT 5.010 (counter value, 1-byte)
- DPT 6.010 (counter value with sign, 1-byte)
- DPT 7.001 (counter value, 2-byte)
- DPT 8.001 (counter value with sign, 2-byte)
- DPT 9.001...9.0021 (floating point value, 2-byte)
- DPT 12.001 (counter value, 4-byte)
- DPT 13.001 (counter value with sign, 4-byte)
- DPT 14.000 … 14.079 (IEEE float, 4-byte)

Interval time:
Telegrams reaching the communication object are divided into various time intervals and assigned to them. At the end of each time period, the telegrams received are evaluated and a minimum and maximum interval value determined. In addition, an average value is calculated and saved. To evaluate a differential calculation, the last respective data value of an interval is also saved.
The smallest and largest values are evaluated as the minimum and maximum values. To calculate the average, the recorded values are totalled and divided by the number of recorded values. If, within a time period, only one telegram data value was received, then the minimum value = maximum value = average value.

The time interval for the detection of data telegrams can be configured separately by the parameter "Interval time" for each datalogger channel. The following interval times are configurable...

- "Minute"
- "Hour"
- "Day"
- "Week"
- "Month"

- The user defines the scaling of the time axis (X axis) in the value-time diagram when reading the diagram. For this purpose, a selection of the following settings is provided in the diagram display directly on the device: "Hour", "Day", "Week", "Month", "Year".
  The time axis in the diagram is shrunk or stretched depending on this setting. The setting thus defines the number of time intervals taken into account in the diagram and therefore the number of visible data values.
  Example: The time axis is set to one hour. The time intervals of the previous hour are displayed in the diagram. The diagram then displays, for example, 60 data values of a datalogger channel with a time interval of one minute if at least one data value could also actually be recorded in each time interval.
- If, within a period of time, no telegram could be received and evaluated, then the corresponding interval is considered "invalid". The characteristic curve is thus interrupted in the value-time diagram of the on-screen display. To prevent such behaviour, the data value sources - such as the room temperature controller, weather stations, etc. - should transmit the telegram data value cyclically to the bus with a cycle time that is considerably shorter than the set time period. At least two telegram data values should be received in a time interval. The evaluation of the minimum, maximum and average values becomes more accurate, the more telegrams are received in the time period.

Poll cyclically:
During data recording, regular incoming telegrams (ValueWrite) or value responses or a cyclic poll (ValueResponse) can be evaluated. Cyclical polling of the object value can be activated separately for each datalogger channel. With activated cyclic polling, the device transmits a value read telegram (ValueRead) to the bus regularly, after a period of time has elapsed. The data source must then return a value response telegram (ValueResponse). The "Read" flag must be set on the transmitting object of the data source for this to function correctly.
The time interval of a cyclic poll can be defined in the configuration software. The setting options automatically align themselves to the configured interval time. This ensures that at least one data value is requested within a time period.

- The device makes a distinction between normal telegrams (ValueWrite) and value response telegrams. With activated cyclic polling, the minimum, maximum and average values are added to the value responses. In this case, additional spontaneous telegrams are only given the maximum and minimum values.
- Cyclic polling is preferable for even average formation.

Specify start value for difference formation:
If the data source is a counter (e.g. electricity meter, people counter, etc.), the data display in the value-time diagram can be configured to differential calculation. A difference between the last value to arrive of the current interval and the last valued of the previous interval - depending on minimum, maximum or average value - is calculated here and displayed as a differential value, provided that the diagram is configured to differential display. The calculated data value differentials then, in the case of an electricity meter, directly represent the consumed units of power within a recording period (e.g. month or year).
To ensure that the differential calculation produces useful display values, only those counter values should be used as data which are counted in one direction (either increasing or decreasing). In addition, differential calculation with data values not from counters is usually meaningless and thus impracticable. Therefore, differential calculation should only be displayed for data channels that have "Counter" configured as the object data type.
After a device reset (power failure, commissioning operation), the differential calculation should start at a specified starting value. This is required in order to initialise the differential calculation so that a differential value can be calculated when starting the data recording after a reset. This means that, in addition, there can be an adjustment to defined basic counter levels - for example after the installation of a new electricity meter.
The system project planner must enter the starting value in the configuration software for the parameters of a datalogger channel. This means that it is stored statically in the device project planning. The following points should be observed:
If a value is entered in the parameter box, the device then evaluates the last data value of the first time period after the reset directly and then shows the difference to the starting value in the display diagram. Alternatively, no start value can be defined. In this case, the device

automatically evaluates the first data value received as the start value. This value does not appear in the data display. Only the differential values calculated after this (last value of 1st period <-> last value of 2nd period, etc.) are transferred to the display as display values.

i With a set cyclic poll of the channel object, only the response telegrams (ValueResponse) of the data source are used to record the differential data. Additional spontaneous telegrams (ValueWrite) are not taken into account in a differential evaluation.

Send e-mail on memory overflow:
If the device is connected to a network via an Ethernet connection and an e-mail account is configured to send e-mail messages, the data values recorded by a datalogger channel can be sent by e-mail on memory overflow (>11,000 data records). In this case, the device prepares the oldest 1,000 data records in CSV format (values are separated by semicolons) and sends them to a specified receiver in a standard e-mail. Afterwards, the sent data is deleted from the memory. Both the e-mail function and the recipient address can be configured in the configuration software with the parameters of a datalogger channel. If no recipient address is configured, only the oldest 1,000 data records will be deleted.
A data record consists of the minimum value, maximum value, average value and the last value (for calculating a difference) of a time interval.

### 4.2.4.13.2 Datalogger display

The data values recorded in a datalogger channel are displayed as a continuous characteristic curve in a value-time diagram. The device can display up to 20 different datalogger diagrams. The datalogger diagrams are available on a separate datalogger page. The datalogger page is opened via the entry "Datalogger" in the main menu.

As soon as the datalogger page is opened, a list of all datalogger diagrams created in the device will be displayed. If too many diagrams are in the list, the list can be switched by the sensor surfaces / .
The datalogger diagrams are clearly selectable by their name. The name can be assigned individually in the configuration software. Furthermore, any additional text can be displayed in the operating element. This additional text can optionally describe the displayed data values in the diagram (e.g. "Heating command value").
The diagram display is recalled by pressing the sensor surface of a datalogger diagram(Figure 63).

Up to 3 datalogger channels can be displayed as curves in a diagram. The curves to be displayed are selected using the parameters "Curve 1", "Curve 2" and "Curve 3".

i Only channels with the same interval times can ever be displayed within a datalogger diagram! The selection of the parameters adapts itself accordingly.

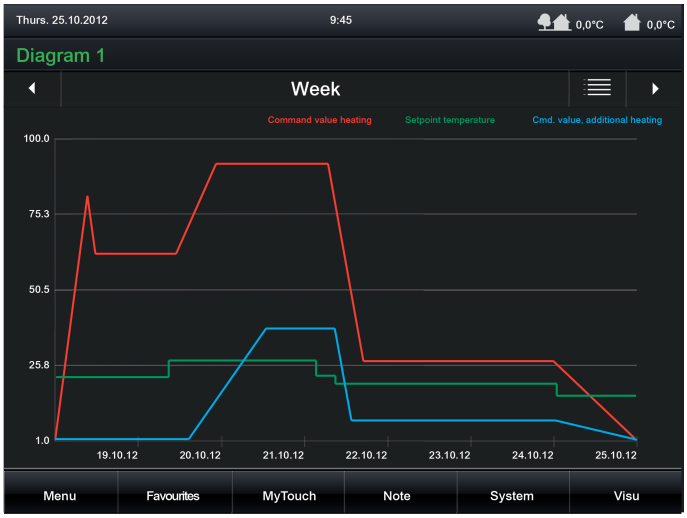


Figure 63: Example of a datalogger diagram with 3 curves

The user defines the scaling of the time axis (X axis) in the diagram. For this purpose, a selection of the following settings is provided in the diagram display: "Hour", "Day", "Week", "Month", "Year".
The time axis in the diagram is shrunk or stretched depending on this setting. The setting thus defines the number of time intervals taken into account in the diagram and therefore the number of visible data values.
Example: The time axis is set to one hour. The time intervals of the previous hour are displayed in the diagram. The diagram then displays, for example, 60 data values of a datalogger channel with a time interval of one minute if at least one data value could also actually be recorded in each time interval.
The setting options are adapted to the time interval of the curves displayed in the diagram. Hence, the "Hour" setting, for example, can only be selected if the time interval is set to "Minute".

The Y axis can be scaled dynamically according to the values to be displayed (specified by minimum and maximum values) or, alternatively, can be permanently configured in a value range. If the scaling of the Y axis is fixed, and there is a data value outside the specified minimum or maximum limits, then the data value curve is drawn in vertically upwards or downwards from the two neighbouring data points.
The Y axis can be given subdivisions to simplify legibility of the diagrams. The subdivisions of the X axis are predefined by the scaling. The title of the Y axis and the visibility and formatting of

the axis labelling can also be configured. In addition, the heading of the diagram and the names of the curves are defined in the parameterisation.

"Gain" and "Offset" can be added to the measured values of a channel to allow the option of modification of the desired measured value ranges in the diagram. In addition, it is necessary to specify in the parameters of a datalogger diagram which data value is to be displayed in the diagram as the "curve type" (maximum value, minimum value, average or differential value).

- Within a diagram, the characteristic curve created from the data values runs from right to level parallel to the time axis.
- If, within a period of time, no telegram could be received and evaluated, then the corresponding interval is considered "invalid". The characteristic curve is thus interrupted in the value-time diagram of the on-screen display.
- In a diagram, the values of a datalogger channel are displayed without reformatting in the way they were received in the data telegram from the bus, providing that no gain or offset is specified in the configuration of the curve. As a result, a data value, for example, received in the format DPT 5.001 (1 byte value) in a value range of 0...255 can be displayed in the diagram. If, in this example, percentage values should be displayed (e.g. command values), the data values can be reformatted by the reinforcement. In such a case, a 1 byte data value (0...255) with a gain of "0.392" can be converted to a percentage data value (0...100 %). This gain should then be entered in the parameter of the same name of the curve concerned in the configuration software.
  An offset causes a shift of the appropriate curve upwards on the Y axis (positive offset) or downwards (negative offset).

### 4.2.4.14 Presence simulation

**Introduction**

The presence simulation can give a person outside the impression that a house or office block is occupied, especially when there is no-one inside. The owners or operating personnel can record any simulations, for example for lighting or shading, over periods of time and play them back when they are not there.
The recording records KNX telegrams in 1-bit and 1-byte data formats and temporarily saves them with time and weekday information. On playing back, the previously saved telegram sequence can either be played back with accurate times or, alternatively, with accurate times and weekdays.
The setting and recording of a presence simulation as well as the starting of a recorded simulation takes place on different menu pages. A presence simulation is set and recorded on the page "Edit presence simulation" in the submenu "System - application settings". The recorded presence simulations are started in the menu "Presence simulation" that can be reached from the main menu.

The presence simulation is configured and operated sequentially in these steps...

- Configuration of the data points in the configuration software(see chapter 4.2.4.14.1. Configuring functions),
- Assignment of the functions (see chapter 4.2.4.14.2. Using presence simulation),
- Recording of a simulation (see chapter 4.2.4.14.2. Using presence simulation),
- Playback of a simulation (see chapter 4.2.4.14.2. Using presence simulation).

### 4.2.4.14.1 Configuring functions

The presence simulation records KNX telegrams and plays them back at a later time when required. To ensure that recording and playback are possible, the system project planner must create special functions in the configuration software that are independent of the rest of the device configurations and assign them to the presence simulation. A function can be added by selecting the entry "Presence simulation" in the configuration software in the project bar and then pressing the "Add function" button in the work area. Up to 32 functions can be created in this way.

Exactly one communication object is assigned to each function. The data format of these function objects can be configured individually. The two formats "DPT 1.001 (i bit switching)" and "DPT 5.001...5.004 (1 byte value)" are available.
A clear designation can be assigned to a function (e.g. "Seating group light" or "Roller shutter living room"), which can later be read off on the device by the system operator for assigning the functions to a simulation. Additional parameter configurations are not required in the configuration software for the presence simulation.

### 4.2.4.14.2 Using presence simulation

#### Select functions

Before a simulation can be recorded, the functions must be selected which are to be integrated in the presence simulation. Functions must already be created in the device configuration and linked with group addresses beforehand so that they can be assigned to a simulation. The term "Functions" is used alternatively here for the name "Objects", since the switching or value objects configured in the configuration activate specific functions, such as switching lights or controlling a shading situation.

It is possible to select the functions of a simulation when the "Functions" dialog menu in the "Edit presence simulation" menu is opened (Figure 64). A list of all configured functions (1...32) of the presence simulation then appears. The corresponding function can be activated and thus added to the simulation by pressing the sensor surface of a function. In this way, up to 15 functions can be assigned to a simulation.
The selection must then be confirmed by pressing the sensor surface "OK". The function selection is discarded by pressing the sensor surface "ESC".

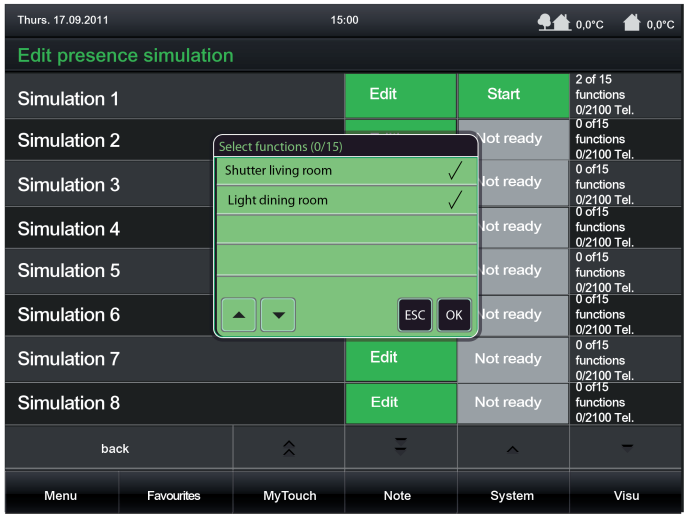


Figure 64: Example of a dialog menu for selecting functions

- The "Start" button will not be activated until a function is added for a simulation. It is displayed in grey and the text "not ready" appears. If functions have already been defined, the text "Start" will be displayed indicating the recording of a presence simulation. It is first possible to play back the simulation in the menu "Presence simulation" after a successful recording.
- Saving takes place as soon as one telegram at least has been recorded.
- If the function selection is changed and resaved after a simulation has been recorded, then the previous recording is deleted. The operator must then record a new simulation (see next section).

#### Recording a telegram sequence

After the operator has selected the functions of the presence simulation, the telegram sequence can be recorded. For this, the operator must first specify a maximum recording period in days. A simulation recording usually takes place independently in the background. The length of the recording period is used to specify when the simulation recording stops automatically after starting. A recording can also be stopped manually at any time regardless of this.

The duration of the recording period is entered after tapping the sensor surface "Start" in the "Duration" dialog window (Figure 65). Time periods from 1...7 days can be configured. A day is

not a calendar day but a 24 hour period.
Example: if the recording begins on Tuesday at 9:00, the first day of the recording will end on Wednesday at 8:59. The start time of the recording thus specifies the start of a day, i.e. of a 24 hour period.

i Before starting recording, ensure that the time and weekday of the device is set correctly!

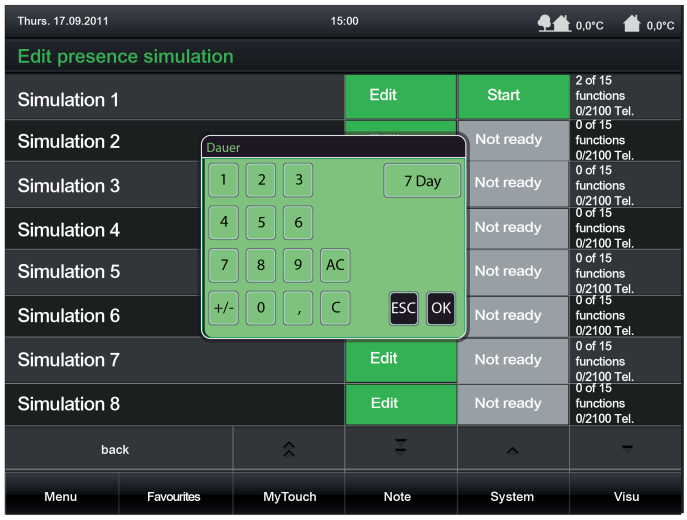


Figure 65: Example of a dialog window for setting the recording period

i During the recording phase, changes to the time (externally by the communication object per IP (SNTP) or direct adjustment on the device) should be avoided so as not to influence the end of the specified recording period during an automatic recording. For this reason, a simulation recording should not take place during a change from summer to winter time.
Example: the recording period is specified as 1 day (24 hours). The recording is started at 8:00 on the first day. If the time were to continue normally, it would be stopped automatically at 7:59 on the next day. If, during the recording phase, the time is put back by 1 hour, then the recording would run for 24 hours but, on account of the new time, would end at 6:59 on the second day. Thus it may occur that telegrams between 7:00 and 7:59 are not recorded or there are time overlaps in the recorded telegram sequence.

The recording will start after acknowledging the entered recording period by touching the sensor surface "OK" . This requires that at least one function was selected beforehand. A house symbol with a red record button displaying a recording process appears in the header.

The recording takes all the incoming telegrams of all the selected functions into account and saves them to the RAM of the device. A maximum of 2,100 telegrams can be recorded. Should a larger amount of telegrams have been reached before the set recording time has elapsed, then the recording will stop. The telegrams received before this time can be saved and then played back later.

Each recorded telegram is issued with a time stamp, accurate to the second. The time stamp takes the current time and weekday into account when the telegram arrives. This information is obtained from the internal system clock of the device. Marking with a time stamp is important on playing back .

The user can also stop a recording before the set recording period has elapsed. To do this, the "Stop" button must be tapped during a recording process. The house symbol in the header disappears.

i Each time a recording is started, the previous recording is deleted.

i An active recording can be signalled to the bus via the 1-bit communication object "Recording active", which can be configured in the presence simulation parameter node in the configuration software.

The display page of the presence simulation does not have to be kept permanently displayed during active recording. The device can be operated as normal during this time.

### Playing a telegram sequence back

After a simulation has been recorded successfully, the saved telegram sequence can be played back. Each telegram was issued with a time stamp on recording. The playback of the saved telegram sequence takes place accurate to the second.

A telegram sequence can be played back once the sensor surface "Start" in the "Presence simulation" menu is pressed. As a result, a dialog window will open in which the type of playback of the presence simulation can be selected (Figure 66).

The sensor surface "Start" can first then be operated once a telegram sequence has been recorded.

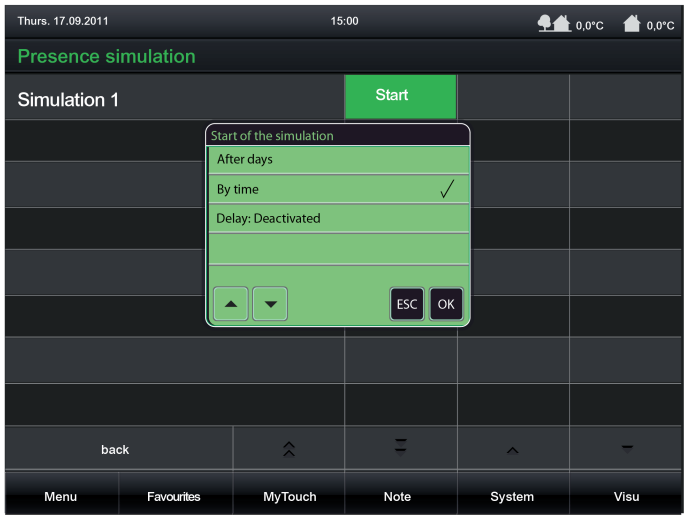


Figure 66: Example of a display page for setting the playback type and playback delay of a simulation

Before the user starts playback, the type of playback must be specified. The type of playback is configured by tapping the corresponding sensor surface. A distinction is to be made between two different cases when setting the type of playback, which are switched over each time the control surface is pressed...

- Type of playback "By days":
  When the telegram sequence is played back, in addition to the time, the weekday upon which the individual telegrams were recorded, is taken into account.
  In this case, the telegrams are played back by weekday. No telegram is played back on days why no telegram was recorded.
  Example 1: recording only took place on a Tuesday and was active for considerably less than 24 hours. On playing back, the simulation is only executed at the recorded times and only on a Tuesday. The simulation has no effect on other days.
  Example 2: recording was limited to 5 days and was started on a Wednesday. Telegrams were recorded on the Wednesday, not on Thursday and Friday (no telegram activity), and telegrams were received again during Saturday and Sunday. On playing back, the simulation is executed on the Wednesday, not on the Thursday and Friday, and then continues on the Saturday and Sunday.
  In every case, the recorded telegram sequence is repeated cyclically according to the weekdays until the playback is stopped.

- Type of playback "By time":
  When the telegram sequence is played back, only the time of the individual telegrams is taken into account. The weekday is ignored.
  The previously recorded telegram sequence is repeated cyclically until the playback is stopped.

The start of a playback of a telegram sequence can optionally be delayed for up to one day. To do this, a time in hours (0...24) must be specified by pressing the sensor surface "Delay" via the on-screen keyboard. The setting "0" deactivates the delay time. In this case, the playback starts immediately after the start command. The delay time only has an effect on the start time of the simulation (like delayed tapping of the "Simulation" control surface) but not on the saved time stamps of the telegrams.
The time of an elapsing delay is displayed in the status text of the control surface (B). This allows the remaining time to be read clearly up until the actual starting process.
The delay time is advisable, for instance, if the start of the simulation should first occur when it can be assumed that no more persons are in the building (e.g. before a weekend or company holiday).

After acknowledging the set type of playback by pressing the sensor surface "OK", the presence simulation will start automatically, possibly with a set delay. A house symbol with a start button appears in the header.

The playback can be cancelled at any time by tapping the sensor surface "Stop". In addition, playback of the presence simulation can be started and stopped using the "Start/stop playback" 1 bit communication object.

i Stopping a playback causes the delay time to stop. This is restarted completely once the start command is given again.

i The previously recorded telegrams of the simulation are worked through chronologically. The time of processing depends on the starting time of the simulation. If, for example, the recording period began at 8:00 but playback is not started until 9:00, then only those telegrams will be transmitted which were recorded at or after 9:00. Telegrams before this time are only taken into account in the next cycle (only time or time/weekday-dependent). During the playback of a recording period, the telegrams are only transmitted once within a cycle. If, during playback, the time of the device is put back, then previously transmitted telegrams of a cycle will not be transmitted anew. If the time is put forward, then the device detects which telegrams were skipped, and then transmits the telegrams in one go, thus synchronising the telegram sequence with the current time.
The same thing happens if, during the recording phase, the time was put back, for example on changing from summer to winter time. In this case, the panel checks during playback to see if the telegram following the current one is more recent in the recording. If this is not the case, due to the change in time in the recording, then the older telegrams are transmitted immediately until the time stamp matches again.

i Active playback can be signalled to the bus using the 1-bit communication object "Playback active", which can be configured in the presence simulation parameters in the configuration software.

i Simulation playback only ever takes place using the group addresses of the function objects to be sent.

i The display page of the presence simulation does not have to be kept displayed during active playback. The device can be operated as normal during this time.

**Resetting simulation**

An entire simulation can be reset if required. At the same time, all function assignments and the saved telegrams are deleted. Resetting is executed when the sensor surface in the dialog window "Edit simulation 1" is pressed .

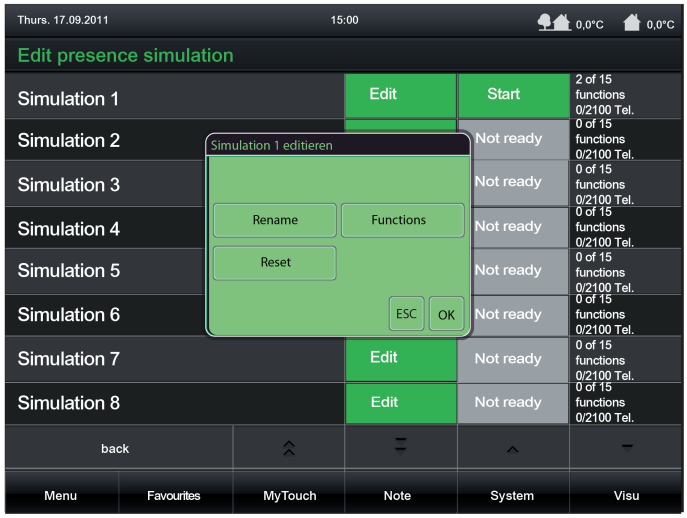


Figure 67: Dialog window for resetting a simulation

A reset simulation can be reconfigured and recorded again at any time.

### 4.2.4.15 Signalling system

#### 4.2.4.15.1 Introduction and basic principles

**Introduction**

The signalling system allows existing sensors of a KNX installation to be included in the configuration of the device for monitoring a building or building section. The signalling system can display the status of window contacts, motion detectors or glass break sensors and monitors changes in the statuses of these detectors.
The detectors integrated in the signalling system can be combined into up to two security areas. Arming these areas allows monitoring of the secured area for break-ins when people are present in or absent from the building. In addition, sections of the area can be monitored for sabotage. If there is a break-in alarm, visual and acoustic alarms can be activated.

The signalling system can be controlled directly on the device using a separate system page. The system status (active detectors, events) and operation (arming/unarming, acknowledgement) is made simple and clear by predefined screens. In addition, arming or unarming is possible using other bus subscribers - for example using touch sensors, push-button sensors or binary inputs with connected operating units. In addition, in the case of an alarm or fault, it is also possible to display system statuses or detector texts on other KNX display units - e.g. info displays or simple LED displays. The signalling system makes separate communication objects available for this.
It should be noted that resetting after an alarm or fault, as well as viewing the event memory is only possible on the device as a central component!

The signalling system is operated on the "Signalling system" menu page. The menu page is opened directly from the main menu (predefined display structure).

As soon as the "Signalling system" menu page is opened, 4 sensor surfaces that execute various functions appear in the display (Figure 68).


Figure 68: Example of a menu page of the signalling system

- Display and sensor surface for arming or unarming the "External" Arm area (can be hidden as required)
- Display and sensor surface for arming or unarming the "Internal" Arm area (can be hidden as required)
- Display and sensor surface viewing the detector statuses
- Display and sensor surface for viewing of the event memory
- Only if messages are present:
  Display and sensor surface for acknowledgement

The display page of the signalling system can be hidden optionally from the main menu. If this is desirable or necessary, the parameter "Function visible" must be deselected in the configuration

software in the global settings of the signalling system. The signalling system is then no longer accessible via the predefined menu structures of the visualisation. It can then only be accessed by means of internal open pages and operated via the communication objects.

- As a function component of the device, the signalling system is not a complete alarm system. For example, if the main or bus power supply fails, uninterrupted operation is not guaranteed. In addition, no signal encoders or transmission devices can be directly connected to the system, meaning that there is no opportunity to monitor these elements. The device's signalling system is also not VDS-certified.
  If such functions or characteristics are required, a suitable alarm centre must serve as a replacement.
- The display page of the signalling system can be protected from access by unauthorised persons by means of its own password. If this is desired, the password protection of the display page must be activated in the configuration software.

**Security areas and configuration**

A security area is an area of the signalling system, which secures specific building sections such as individual rooms, building wings or facade areas and monitors them for break-ins. In the security areas, detectors are those components which allow such monitoring. These detectors could be magnetic contacts on windows or doors, motion detectors on walls or ceilings in interiors as well as glass break sensors. Detectors can be connected to the KNX via suitable components (button interfaces, binary inputs, etc.) or, depending on the device version, be connected to the KNX directly.
Security areas can be activated and deactivated, i.e. armed and unarmed. Arming and unarming takes places either directly on the device or using the external KNX switching units.

- External switching units are components such as keyswitches, transponder units, code keypads or block locks. In many cases, such units are intended for use in alarm or signalling systems and, for this reason, can monitor for sabotage. Simple installation buttons or KNX push button sensors can also easily be used as switching units. However, these do not provide any protection against unauthorised sabotage access. For this reason, button sensors are often attached within a building to be protected, for example to activate the external skin monitoring ("internal arming").
  External switching units can be coupled to the device's signalling system using separate 1-bit objects. The sabotage contacts of the switching unit can be included using the "Sabotage" detector input (see page 171).

The signalling system makes a distinction between security areas, the interior and the external skin. This distinction allows separate monitoring and arming of different building sections depending on whether authorised people are in them or not. During the configuration of the signalling system in the configuration software, created detectors are assigned to the security areas.

"External skin" security area:
The external skin separates the indoor area of a object to be secured, from the external area. Detectors integrated in the external skin can, for example, detect unauthorised access or sabotage to the house or garden door, to the building windows and to the garage door. In these cases, suitable detectors are often magnetic contacts or glass break sensors.
The external skin can be armed separately. Arming usually take place using a switching unit located within the building (e.g. control surface on the device, button sensor). In this case, there are authorised people in the building. Only monitoring of the external skin takes place. Only the internal siren is activated when there is an alarm. This status is called "internally armed".

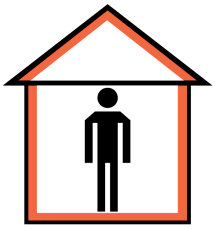

Figure 69: External skin as signalling area - "internally armed"

"Interior" security area:
Detectors are assigned to the interior of a building to be secured which can protect the interior area, i.e. the lived in spacers of a building, against break-ins and sabotage. Suitable detectors would be magnetic contacts on internal doors or motion detectors on walls or ceilings.
The interior is always armed and monitored together with the external skin. Arming often take place using a switching unit, for example located on the outside, next to the entrance door. This switching unit can also be located within a building, however, (e.g. control surface on the device, button sensor) and can arm the security areas in conjunction with an arming delay (see page 174-175). When armed, no authorised people are in the building. There is then external skin and interior monitoring. The internal siren and the visual alarm are activated when there is an alarm. This status is called "externally armed".

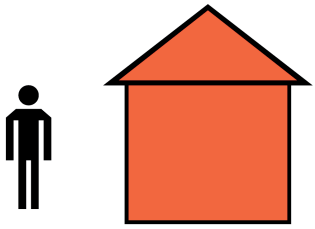

Figure 70: Interior with external skin as signalling area - "externally armed"

**System statuses**

The signalling system reacts differently to incoming signals or commands, depending on the whether the security areas are armed or unarmed. The signalling system distinguishes between up to five statuses .

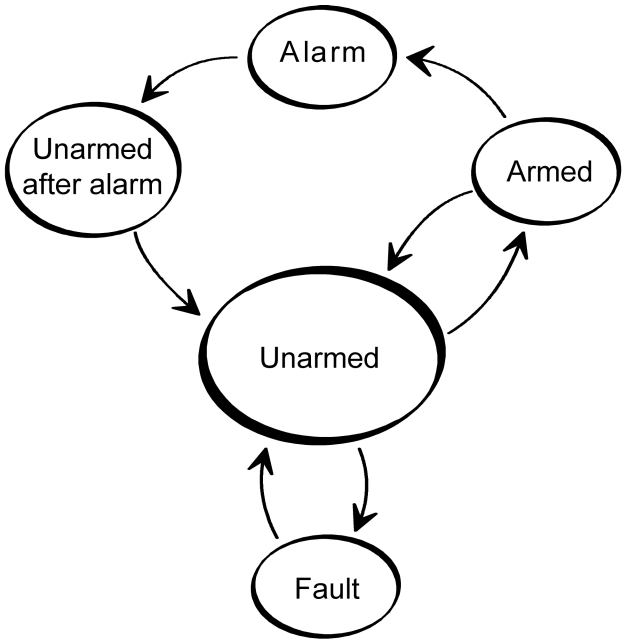


Figure 71: System statuses of the signalling system

A distinction is made between the system statuses...

- "Unarmed" status:
  If both security areas are unarmed, break-in messages in these areas (e.g. a window is opened), or a a sabotage messages do not lead to an alarm. Active detectors are then only displayed in the list of detector statuses. The system can only be armed from the "Unarmed" status, when the appropriate security areas are ready for arming. The status display of a security area on the display page of the signalling system displays "Arm" when detectors in the appropriate area are inactive. If detectors are active, then the status displays "not ready".
  In the "Unarmed" status, sabotage signals (active sabotage input) will lead to a fault, which is signalled via the appropriate communication object or directly on the device (cf. "Fault" status). The "Unarmed" status can be signalled using the "Arming message, internal" or "Arming message, external" and "Unarming acknowledgement" objects on the bus.

- "Armed" status:
  A security area can only be armed when all the detectors assigned to this area are inactive and there is no fault. In this case, the "Armed" status is displayed on the display page of the signalling system.
  In addition, this status can be signalled on the bus for each security area using the "Ready to arm ..." status ("0" = Not ready to arm / "1" = Ready to arm).
  If security areas are armed, break-in messages in these areas will trigger an alarm. A distinction is made between...

  "Internally armed": only the external skin of a building is monitored. Authorised people are located in the interior of the building. No alarm is triggered unless the external skin is infringed. Motion detectors installed in the interior detect movements but no alarm is triggered. A sabotage signal will immediately trigger alarm in the "internally armed" status.

  "Externally armed": all the internal and external detectors, i.e. both security areas, are monitored. An alarm is triggered when any detector responds (also the sabotage detector).

  Should an area not be ready for arming, the status indication of a security area displays "Not ready" and the value of the "Ready to arm" object is "0". Before arming in this case, the cause (e.g. an open window) must be detected and eliminated. The list of the detector statuses that displays all the active detectors can help here.
  It is possible to configure an arming delay time in the configuration software for both internal and external arming. For example, the delay time is necessary when a switching unit (e.g. keyswitch) is located within an areas to be monitored and the area is evacuated before arming. The same applies when the system is armed externally on the device. The delay time specifies after what time the system is actually armed after an arming command. When setting the time, a time reserve should be planned, so that the user is still able to leave the building to be secured correctly before actual arming. Only when the delay time has elapsed should there me no detectors active, as otherwise arming will not take place.
- "Alarm" status:
  If a detector within an armed area responds, the signalling system switches to the "Alarm" status and activates the internal siren and, with additional external arming, also the visual alarm.
  If an additional detector triggers after a prior alarm, then a subsequent alarm is activated. In so doing, the internal configured siren is again triggered and, if necessary, switched on again.
  An alarm can only be deactivated by unarming using the switching devices or deactivated directly on the device using the appropriate control surface.
  If an alarm delay time was configured in the configuration software, a "Prealarm" can be activated first. A prealarm can be signalled by the piezo buzzer of the device and/or by a separate communication object. The system can be unarmed during a prealarm, without triggering an alarm. The transition to "Alarm" status then takes place without unarming only when the appropriate alarm delay time has elapsed, which can be configured separately for internal and external arming. A subsequent alarm is always activated without delay.
- Status "Unarmed after alarm"
  After an alarm was reset through unarming (internal siren deactivated, visual alarm still activated), the system switches to the status "Unarmed after alarm". After an alarm, the cause of the alarm must always be determined. In this status, the triggered detectors of the security area affected by the alarm are displayed in the event memory of the device (see page 181). In so doing, all the events are logged between system arming and unarming. In the "Unarmed after alarm" status, there must first be an acknowledgement using the control surface of the same name on the device in order to return to the "Unarmed" status. The system can only be rearmed when all the previously tripped detectors of the affected security areas were reset.

- "Fault" status:
  The system switches to the "Fault" status when the sabotage detector has tripped or if, during detector monitoring, at least one missing detector was detected. A fault restricts the function of the signalling system to such an extent that proper operation can no longer be guaranteed.
  If a fault results from the "Unarmed" status, then the system cannot be rearmed (status display on the device "Not ready"). In this case, the fault must be detected using the list of detector statuses and eliminated through acknowledgement .
  In the armed status, sabotage or a missing detector will immediately trigger an alarm. In this case, the system will only switch to the "Fault" status, after the alarm was acknowledged.
  A fault message can be signalled to the bus using the "Fault" object.

### 4.2.4.15.2 Detector

**Detector types**

The detectors of the signalling system are components that communicate via the KNX, which monitor a part of a building and signal a break-in or attempted break-in on the device. Commonly used detector types supported by the panel include magnetic contacts, glass break detectors and motion detectors. Special detectors can also be sabotage detectors, allowing sabotage or fault contacts of alarm encoders or switching devices (e.g. keyswitches) to be integrated in the signalling system. Also, lock monitors, such as bolt switch contacts, are detectors permitting a positive drive. This means that, for example, an area can only be armed when the front door is closed, i.e. the bolt switch contact is not active.

A triggered detector allocated to a security area is immediately evaluated in the signalling system and, when armed, immediately leads to an alarm. When armed, all the detectors of a security area are evaluated after a delay after triggering, if an alarm delay time was configured (see page 177). When the system is unarmed, triggered detectors - such as an open window - prevent active arming of the affected detector areas.
When the system is unarmed, a triggered sabotage detector causes a fault display and thus prevent arming of the system. When armed, an active sabotage detector immediately triggers a sabotage alarm.

The detector type (contact, movement, glass break) is defined for detectors of a security area and configured separately in the configuration software for each detector (see next section). The type "sabotage detector" is specified automatically by the use of a separate communication object, independently of the security areas.

**Creating detectors and detector communication**

During configuration of the signalling system, detectors are added in the form of detector inputs in the configuration software "Interior security area" or "External skin security area".

i Up to 40 detectors can be created.

Each newly created detector can be assigned a name (identifier), which then clearly identifies the detector. This text should not exceed 14 characters (e.g. "Kitchen window", "Garage door"), since only a maximum of 14 characters are transmitted via the bus. The text is later displayed during system operation in the list of detector statuses on the device screen or in the event memory if there is activity on the part of the detector, an alarm or a fault. Optionally, if there is an alarm, the detector text can be transmitted to the bus using separate 14 byte communication objects.

The detector type of a detector (contact, movement, glass break) is specified by the parameter of the same name of the detector input. The configured type only specifies the text display and the symbol in the list of detector statuses (see next section) and has no further effect on the behaviour of a detector.

Each detector input has its own 1 bit communication object. The detectors are normally connected to the bus using suitable KNX components (such as binary inputs, button interfaces, etc.) and are thus connected to the detector system. The connection is made between the detector object of the device and the object of the bus device to which the detector is connected with one group address each. For reasons of clarity and detector monitoring, only one single detector may be connected to each detector object of the device (Detector -> Detector text -> Security area).

In the configuration software, each detector input can be configured to different telegram polarities, i.e. individual detectors can be active with a "1" telegram or a "0" telegram. The polarities configured in the signalling system must agree the edge parameters of the other bus subscribers. The following table clarifies the relationship between telegram polarity and edge evaluation in the bus device of the detector.

| Detector contact type / Status | Edge reaction in the detector bus device | Tele-gram value | Parameter in the signalling system | Detector triggers |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| NO contact / not actuated | Rising = ON | 1 | Active on 0 | no |
| NC contact / Actuated | Falling = OFF | 0 | Active on 0 | yes |
| NO contact / not actuated | Rising = OFF | 0 | Active on 1 | no |
| NC contact / Actuated | Falling = ON | 1 | Active on 1 | yes |
| NO contact / Not actuated | Falling = OFF | 0 | Active on 1 | no |
| NO contact / Actuated | Rising = ON | 1 | Active on 1 | yes |
| NO contact / Not actuated | Falling = ON | 1 | Active on 0 | no |
| NO contact / Actuated | Rising = OFF | 0 | Active on 0 | yes |

Edge evaluation and telegram polarity of a detector telegram

Example 1: With the setting "Input active on 1" in the detector system, a glass break sensor may only trigger when there is a glass break and, in this case, the binary input, to which the glass break sensor is connected, transmits a "1" telegram to the bus.

Example 2: With the window contact setting "Input active on 0-telegram" the contact detects a 0-telegram when the window is open. If the window is closed, a 1-telegram must be sent once in order to set the detector to inactive.

The sabotage detector must not be created specially. The sabotage input is created independently of the security areas in the view of the communication objects of the signalling system as standard and can be connected to a group address. A fault triggered by a sabotage input has a global effect on all the areas of the signalling system and requires special acknowledgement (see page 180). In addition, the telegram polarity of the sabotage detector input is permanently predefined and cannot be set. The sabotage input of the signalling system triggers when a "1" telegram is received via the "Sabotage" object.

**List of detector statuses**

All active detectors are displayed in the list of detector statuses. The list is available commonly for the internal and external Arm areas and is recalled when the sensor surfaces "Detector statuses - Polls" are pressed. This makes it easy to detect which detectors are preventing system arming, for example. In addition, it is easy to see at any time which windows and doors are open in the building.
In addition, missing detectors and a triggered sabotage detector are entered in the detector list, allowing identification of the cause of a fault.

The following events are shown summarised in the list of detector statuses...

- all active detectors of the respective security area
  (Entry "<Detector name> + <Identification of the detector type>"
  Example: "Garden door open", "Glass break, kitchen window", "Movement in corridor"),
- An active sabotage detector ("Sabotage" entry),
- All the missing detectors (Entry "<Detector name> + <Text, detector missing>"
  Example: "front door detector missing").

An entry only remains visible in the list of detector statuses until the appropriate detector is inactive again or has been detected as present.

**Detector monitoring**

Within a configurable monitoring period, the signalling system checks that the detectors created in the security areas exist, i.e. whether they are still connected to the KNX and are functioning. For this purpose, the device sends a read telegram cyclically to the bus subscriber to be tested via the group address connected to the detector input, e.g. to the transmitting object of a binary input. This bus subscriber must then send a response telegram back immediately to the signalling system. This response must have reached the device within a timeframe of 2 seconds.
If a contacted detector does not respond or responds after a delay, then the signalling system will check the appropriate detector a second and - if again no response is received - a third time within a short period. If, after the third query, the detector has still not responded, a fault (in the "Unarmed" status) or in alarm (in the "Armed" status) is triggered without further delay, depending on the system status.
If a missing detector causes an alarm, additional missing detectors can trigger subsequent alarms.

Each detector of a security area created in the configuration software is monitored in the manner described. The "Detector poll interval", which can be set in the parameters of the signalling system, defines the time between two read telegrams, i.e. the time between two detector tests. The signalling system polls all the created detector inputs in turn in this way. Example: poll interval: 10 s, 40 detectors have been created. -> A detector is polled every 10 s. After approx. 400 s, all the detectors have been tested. After this, the cycle test is continued again with the first detector.

The signalling system tests detectors considered missing cyclically at brief intervals, in order to be able to detect quickly whether or not the detector has reconnected. This is important for resetting a fault.

Detector monitoring does not take the sabotage input into account or the inputs for arming/unarming the security areas.

After switching on the power supply of the device, or after a commissioning operation, the signalling system quickly tests all the created detectors during device initialisation for their existence and, during the responses, evaluates the transmitted detector statuses (active / inactive). To avoid faults in the signalling system, all the detectors should already have been commissioned properly and be functional during device commissioning.
In addition, the detector poll may cause a delay of maximum 40 s before the signalling system is ready for arming after a device reset (precondition: all the detectors are inactive).

Care should always be taken to ensure that each detector input created in the configuration software is also linked to a group address and that there is a communication partner in the bus. For detector monitoring to function, the "Read" flags must be set on the objects to be transmitted by the bus devices of the detectors.
For each detector to be monitored, it is also important that the group addresses of the detectors to be transmitted are clear, i.e. are not connected to any other transmitting bus subscriber. Each messages must have an independent connection to its own detector input on the signalling system. Only then can it be ensured that only the contacted detector responds and that detector monitoring is clear.

### 4.2.4.15.3 Arming

**Arming/unarming the security areas**

The signalling system makes a distinction between security areas, the interior and the external skin. This distinction allows separate monitoring and arming of different building sections depending on whether authorised people are in them or not. For this reason, the device allows internal and external arming (see page 165-166).
A security area can only be armed when all the detectors assigned to this area are inactive and there is no fault in the system.

Arming and unarming takes place either directly on the device or using KNX switching units, such as push-button sensors or push-button interfaces or key switches connected to binary inputs. There are also two separate 1 bit communication objects available for arming the bus, one for internal arming and one for external arming. The telegram polarity of these objects is fixed: "1" = Arm / "0" = Unarm.
Arming on the device is possible on the display page of the detector list using the "External" or "Internal" control surfaces, but only if the Arm areas are also ready for arming. Unarming takes place via the same control surfaces. The device automatically switches the function (Arm / Unarm) according to the current system status. Local arming using the control surfaces can be prevented in the parameter configuration of the configuration software by hiding the control surfaces.

Arming without arming delay:
The area to be armed must be ready for arming. On internal arming, the signalling system only tests the external skin whilst on external arming, both the internal skin and the interior are tested for arming readiness. The list of detector statuses helps the system operator to detect active detectors which prevent arming readiness.
Pressing the Arm control surface on the device or sending a "1" telegram to the "Internally armed" or "Externally armed" object causes the system to switch to the "Armed" status immediately.

Arming with an arming delay:
Arming with an arming delay is often used when the switching device
(e.g. the device or a button sensor) is installed in the secure area of the building. In this case, the system operator must be able to arm the system and still be able to leave the building in time. The arming delay can be configured separately, using the parameter of the same name in the configuration software, for internal and external arming. Delay times of 0 to 255 s can be configured. The setting "0 s" (presetting) deactivates the arming delay for the appropriate arming operation. When setting the time, a time reserve should be planned, so that the user is still able to leave the building to be secured correctly before actual arming.
The delay time specifies after what time the system is actually armed after an arming command (turning of the keyswitch or pressing of the Arm area on the device). In so doing the signalling system only checks the arming readiness of the security areas after the delay time has elapsed.

Example: the system is to be armed externally on the device. For external arming, the system operator must leave the building. The front door is still open. Therefore, the device displays "not ready". The operator can still carry out the arming command on the device. The signalling system starts the arming delay. Within this time, the owner leaves the building and locks the front door. This makes the system ready for arming (no more detectors are active). When the delay time has elapsed, the signalling system checks for the arming readiness system status. If it is ready, the system arms immediately.

Should, however, a detector still be active after the arming delay has elapsed, (e.g. front door not closed or window opened), then arming does not take place! Here too, the list of detector statuses helps the system operator to detect active detectors which prevent arming readiness before setting the arming command. If the system does not arm after the delay time has elapsed, then no acknowledgement will take place either (see next section).

- An elapsing internal arming delay is unarmed when sending a 1-telegram to external arming.
- An elapsing arming delay can be cancelled at any time by unarming.
- Closing the pop-up window does not cancel the arming.

Unarming:
In the "Armed" status, the system can be unarmed at any time. To do this, either the "Unarm" button must be pressed on the device or a switching device must be set to "Unarmed". The system then switches to the "Unarmed" status immediately.
If an alarm has occurred, then an Unarm command will reset the alarm (deactivation of the internal siren) and switch to the "Unarmed after alarm" status. If there is an alarm delay, then unarming within the elapsing delay time (prealarm) will prevent a alarm from being triggered (see page 177).

- The following always applies: if there is internal arming or an internal arming delay is elapsing, then external arming is not possible. Internal unarming must take place and then, if the system is ready to arm, external arming is possible. The reverse is true in like manner.
- The signalling system only reacts to an arming or unarming command, when a system status change is possible (Unarmed -> Armed / Armed -> Unarmed / Alarm -> Unarmed after alarm). Repeating telegrams (Armed -> Armed / Unarmed -> Unarmed - e.g. for KNX switching units with cyclic transmission) are ignored by the signalling system.
- Arming or unarming is saved in the event memory along with the date and time (if necessary, only after the arming delay has elapsed) (see page 181).
- An internal arming is unarmed when sending a 1-telegram to external arming.

**Signalling during arming/unarming**

In the case of external arming, the signalling system can confirm its status change "Unarmed" to "Armed" via the visual signal encoder output ("acknowledge"). This means that it is possible to detect clearly whether the system has responded to an arm command as required or not. This is particularly important when the system is operated remotely - without seeing the device- or in the case of an arming delay. The visual signal encoder will not give an acknowledgement on unarming. The signal encoder is also not controlled for internal arming.
Whether the visual signal encoder is controlled in the case of external arming can be set in the configuration software using the parameter "Visual acknowledgement on external arming" in the parameters of the signalling system. This means that it is possible to switch visual feedback off.

In addition, various signals are available to signal the status of the signalling system. These signals are 'run out' using separate KNX 1-bit objects and can be tapped.

The following objects can be configured in the parameters of the signalling system in the configuration software...

- "Ready to arm, internal" and "Ready to arm, external":
  These objects signal the readiness of the assigned security areas separately for internal or external arming. If the areas are ready for arming, the object value is "1". If they are not ready, the object value is "0".
  When the system is armed (no matter whether internally or externally), both objects switch back to "0", irrespective of which status is displayed on the page of the signalling system on the device.
- "Arming message, internal" and "Arming message, external":
  These objects signal whether the appropriate security areas are armed or unarmed separately for internal or external arming. Signalling is static for the length of the status. An object value "1" means "Area(s) armed", whilst an object value "0" means "Area(s) unarmed". "Unarmed" is signalled in the system status "Unarmed after alarm".

- "Arming acknowledgement":
  This object dynamically signals successful internal or external arming for the length of the "Arming acknowledgement time" set in the configuration software. No distinction is made between the security areas. The object value switches to "1" as soon as the system has armed. The object value returns to "0" automatically when the arming acknowledgement has elapsed. It is possible to cancel arming acknowledgement by unarming before the arming acknowledgement time has elapsed.
- "Unarming acknowledgement":
  This object dynamically signals successful internal or external unarming for the length of the "Unarming acknowledgement time" set in the configuration software. No distinction is made between the security areas. The object value becomes "1" as soon as the system has unarmed (status change "Armed -> Unarmed" or "Alarm -> Unarmed after alarm"). When the status changes from "Unarmed after alarm -> Unarmed", there is no unarming acknowledgement. The object value returns to "0" automatically when the unarming acknowledgement has elapsed. It is possible to cancel unarming acknowledgement by arming before the unarming acknowledgement time has elapsed.

i If, after an arming command (or after an arming delay has elapsed), the signalling system does not arm, because the affected security areas are not ready to arm, there will be no acknowledgement. In this case, the dynamic object "Arming acknowledgement" and, in the case of external arming, the visual signal encoder are not controlled (no negative acknowledgement).

i To be able to distinguish between dynamic objects for arming and unarming, the acknowledgement times for "Arming" and "Unarming" should be of different lengths. When arming or unarming is repeated ("Armed" -> "Armed", "Unarmed" -> "Unarmed"), there is no retriggering of the dynamic signalling. This is only transmitted once on changing status.

### 4.2.4.15.4 Alarms

**Activating and deactivating an alarm**

If a detector within an armed area responds, or a sabotage detector triggers when armed or any detector is found to be missing, the signalling system switches to the "Alarm" status and activates the internal siren and, with additional external arming, also the visual alarm. For this, "1" telegrams are transmitted to the bus using the corresponding 1 bit communication objects. In addition, the device transmits a "1" telegram via the "Alarm" object. This allows any switching function to be executed in the bus. In addition, the signalling system uses the 14 byte object "Alarm detector text" to display the detector text of the detector which triggered the alarm.

The internal siren is an alarm encoder activated for a set period of time. The system project planner must set the switching length of the internal siren in the configuration software. Switching times of 2 to 255 s are configurable. The signalling system automatically deactivates the internal siren when the switching time after the alarm is triggered has elapsed. The visual alarm (e.g. a flashing light on the exterior of the building) remains activated for the entire length of the alarm status (see "Alarm acknowledgement" section below).
An alarm and the detector that causes the alarm are logged in the event memory of the device (see page 181).

An active alarm can be switched off by unarming on the device or on a KNX switching unit. In this case, the device switches the internal siren off if it has not already been switched off automatically after a period of time has elapsed, transmits a "0" telegram to the bus via the "Alarm" object and switches to the status "Unarmed after alarm". The visual alarm (for external alarming) still remains switched on.

i In the case of an alarm, the device can also send an e-mail with a predefined text, providing that the Ethernet functionality of the device is used and an e-mail account was configured. For this purpose, the "Alarm" object of the signalling system can be linked to the object of an event e-mail of the device using an internal or external group address.

In the case of an alarm, a red triangle is displayed in the header of the screen. This symbol will also remain visible even if an alarm - e.g. by a switching device - was disabled and the system is in the status "Unarmed after alarm". This makes it possible for persons to easily recognise on the device that an alarm is or was present irrespective of the visible display page. The symbol in the header goes out after successful acknowledgement of an alarm.

**Alarm delay / Prealarm**

An alarm delay can optionally be configured for the internal and external arming. An alarm delay is often used when the switching device (e.g. the device or a button sensor) is installed in the secure area of the building. In such cases, authorised people must be able to enter the secured building area, meaning the status the switching device for unarming can only be reached after a delay.
The alarm delay can be configured separately for internal and external arming using the parameter of the same name in the configuration software. Delay times of 0 to 255 s can be configured. The setting "0 s" (presetting) deactivates the alarm delay for the appropriate arming operation.

When an alarm time delay elapses during system operation, a dialog will window open in which the time delay is decremented to zero as with arming with arming delay.
Furthermore, a "prealarm" can be activated. Depending on the parameter configuration, a prealarm is signalled by the piezo buzzer of the device and/or separate 1-bit communication objects. During a prealarm, an authorised person can unarm the system without triggering a "real" alarm. The transition to the "Alarm" status only takes place is the system is not unarmed during the prealarm.

i A prealarm configured in the configuration software only functions if an alarm delay time of more than 0 s has been configured. Otherwise the prealarm will not be executed during system operation.

An alarm due to a triggered sabotage detector or a missing detector is always executed without delay.

**Subsequent alarm**

If an additional detector of an armed security area triggers after a prior alarm, then a subsequent alarm is activated. In so doing, the internal configured siren is again triggered and, if necessary, switched on again. A detector which previously triggered an alarm cannot trigger a second subsequent alarm.
A subsequent alarm is always activated without delay, even with a planned alarm delay.
A subsequent alarm and the detector causing it are logged in the event memory of the device (see page 181). In addition, the signalling system uses the 14-byte object "Alarm detector text" to display the detector text configured in the configuration software of the detector which triggered the alarm.

**Alarm acknowledgement / "Unarmed after alarm"**

Each alarm must be acknowledged directly on the device. Without alarm acknowledgement, it is not possible to switch to "Unarmed" status and thus additional arming. The system operator can acknowledge an alarm in the status "Unarmed after alarm".

Primarily, there are two methods of acknowledging an alarm...

- Separate unarming + acknowledgement:
  An active alarm (internal siren + "Alarm" object switched on) can - as described above - be deactivated by unarming. The system switches the internal siren off if it has not already been switched off automatically, transmits a "0" telegram to the bus via the "Alarm" object and an unarmed acknowledgement to the bus and switches to the status "Unarmed after alarm". The visual alarm (for external alarming) remains switched on.
  In the "Unarmed after alarm" status, the operator can the inspect the event memory directly on the device to see which detector triggered the alarm at which time. The alarm can usually then be confirmed by pressing the "Acknowledge" control surface on the device and then reset completely. The system then switches the visual signal off (for external alarms) and then switches to the "Unarmed" status. In this case, there is no additional unarming acknowledgement. The device transmits the text "No alarm" to the bus via the 14 byte object "Alarm detector text".
  In the "Unarmed after alarm" status, the piezo buzzer of the device is controlled in order to alert the user to go to the device and acknowledge the alarm.
- Unarming by acknowledgement:
  An alarm can also be acknowledged directly without separate unarming and thus reset. Such behaviour is advisable, for example, when the internal siren set for a specific time after an alarm has already turned "quiet", i.e. need not be turned off, or the system is operated directly on the device. For this purpose, the "Acknowledge" button can be pressed on the menu page of the device in the "Unarmed after alarm" status.
  With such operation, the signalling system completely deactivates the alarm and acknowledges it at the same time. Deactivating the alarm switches off the visual alarm (for external alarms) and the internal siren, if this has not already been switched off automatically. In addition, the system transmits a "0" telegram via the "Alarm" object and the text "No alarm" to the bus via the 14 byte object "Alarm detector text". The system then immediately switches to the status "Unarmed" without any separate unarming acknowledgement. This type of operation does not set the status "Unarmed after alarm". Before or after the "Acknowledge" control surface is pressed, the system operator can inspect the event memory directly on the panel to see which detector triggered the alarm at which time.

After an alarm has been acknowledged, the system automatically switches to the "Fault" status, if, for example, the sabotage input was the detector triggering the alarm. This subsequent fault must then be acknowledged separately on the device. The cause of the fault must have been eliminated for a fault message to be acknowledged (see page 180).

### 4.2.4.15.5 Fault

**Cause of fault and fault behaviour**

The signalling system switches to the "Fault" status when the sabotage detector has tripped in unarmed or if, during detector monitoring while unarmed, at least one missing detector was detected. If the system is armed, then these events will lead to an immediate alarm. In this case, the system will switch to the "Fault" status, when the alarm has been acknowledged.
A fault restricts the function of the signalling system to such an extent that proper operation can no longer be guaranteed. A fault causes the system to no longer be armed for as long as the fault has not been eliminated. The list of detector statuses and the event memory can be used to detect the cause of the fault and the time the fault was activated.

If there is a system fault, the device transmits a "1" telegram via the "Fault" object. This allows any switching function to be executed in the bus along with other signalling operations, e.g. using a transmission device. An e-mail, predefined in the device, can also be set by linking this object with an e-mail event.

If the fault was triggered by a missing detector, the signalling system uses the 14 byte object "Fault detector text" to display the detector text of the faulty detector. If several detectors are missing, then the detector text of the detector is transmitted which was most recently detected as missing.
If the fault was triggered by the sabotage detector, then the test "Sabotage" is transmitted to the bus via the 14 byte object.

The fault status continues to remain active, even if the cause of the fault has already been eliminated. The status is first reset after the system operator has acknowledged the fault directly on the device.

**Acknowledgement of a fault message**

A fault must always be acknowledged directly on the device. Without a fault acknowledgement, it is not possible to switch back to "Unarmed" status and thus additional arming. The cause of the fault must have been eliminated in order to be able to acknowledge a fault. This means that the sabotage detector may ot be active before acknowledgement, ad all the detectors of the security areas must have been detected as existing. The list of detector statuses can be used to detect which detectors may be preventing the acknowledgement of a fault.
After the operator has acknowledged a fault, the device uses the "Fault" object to transmit a "0" telegram and, via the 14 byte object "Fault detector text", the text "No fault" to the bus. After this, the signalling is system is ready for operation again.

i After an alarm has been acknowledged, the system automatically switches to the "Fault" status, if, for example, the sabotage input was the detector triggering the alarm. This subsequent fault must then be acknowledged separately on the device in the manner described.

### 4.2.4.15.6 Event memory

The signalling system has a non-volatile event memory in which specific fault messages and all the events in armed security areas can be recorded (Figure 72). The event memory is recalled by pressing the sensor surface "Events - Polls".

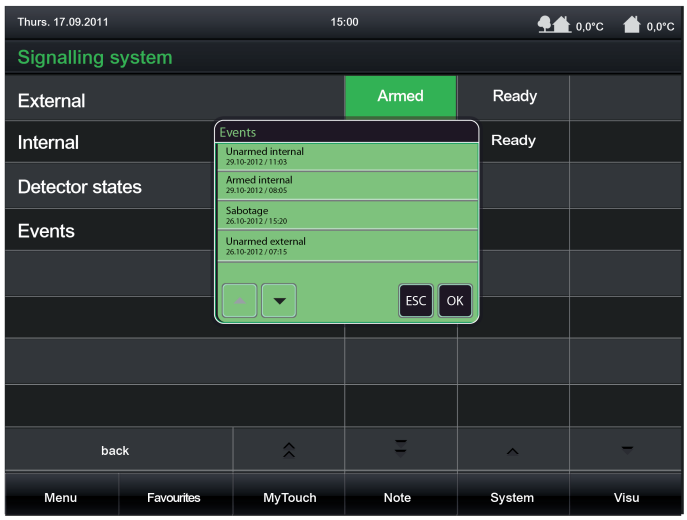


Figure 72: Example of a display in the event memory

The following events and fault messages are given time and date and are logged in the event memory...

- "Arming, internal" (internal arming),
- "Arming, external" (external arming),
- "Unarming, internal" (internal unarming),
- "Unarming, external" (external unarming),
- "Alarm" (also subsequent alarms),
- "Detector activated: <Detector text>" (Detector which caused the alarm or subsequent alarm),
- "Alarm reset" (acknowledgement of an alarm),
- "Sabotage" or "Detector missing: <Detector text>" (cause of the fault),
- "Acknowledgement" (fault acknowledgement),
- Reset" (return of power supply, commissioning operation).

i Active detectors are not recorded in the event memory in the "Unarmed" status.

Events are stored in the RAM of the device. Previous events will be lost in the case of a mains voltage failure. The size of the event memory depends on the device's available memory resources for the KNX application.

#### 4.2.4.15.7 Response to a device reset

After switching on the mains power supply of the device or after a commissioning operation, the signalling system always switches to the "Unarmed" status. Then the signalling system quickly tests all the created detectors of the security areas for their existence and ability to transmit and, during the responses, evaluates the transmitted detector statuses (active / inactive). This checks the security areas for their readiness to arm. During initialisation, the detector poll may cause a delay before the signalling system is ready for arming after a device reset (precondition: all the detectors are inactive). Should an active sabotage detector or a missing detector be detected, then the system switches to the "Fault" status.

Immediately after a reset, the signalling system generates a defined object status by setting all the KNX communication objects to values that correspond to the set system status. The system also transmits telegrams.

i The device, and thus also the signalling system, switches off when the mains power supply fails. If the mains or bus power supply fails, uninterrupted operation is not guaranteed. Detector status, alarm and fault signals are not saved when the bus or mains power supply fail.

### 4.2.4.16 Video messages

#### 4.2.4.16.1 Introduction

A colour camera and microphone are integrated in the device. This periphery makes it possible to record video messages with sound and to play them back directly on the device at any time. The user can record up to 8 different messages with a variable length of up to one minute each and store these permanently in the device memory. A video message can be used, for instance, to contact family members when they are not there or to issue instructions to operating personnel.

The recording, playback and management of video messages takes place via the menu "Note".

New video messages can be recorded, played, and if no longer needed, can also be deleted via the operating elements in the footer.
It is possible to browse through several existing messages whose titles and recording times can be displayed via the display and operating elements in the header.

The device displays the presence of video messages on any display page in the header of the screen by means of a camera icon. This makes it possible for persons to easily recognise that there are messages.

### 4.2.4.16.2 Recording video messages

The recording mode can be started by clicking on the white cross in the control surface in the footer (Figure 73). It is possible to record new video messages there. The control surface "Record" (I) can be pressed to start a new recording. The device then starts immediately with the recording. The display area (E) shows a live video during the recording. The bar graph (G) also shows the recording time that has elapsed so far. The recording volume can be set with the operating elements (F). Recordings with a maximum length of 1 minute are possible. The recording can be stopped by pressing the control surface "Stop" (H). Alternatively, a recording is stopped automatically when the maximum recording time has been reached.

After the recording has been stopped, the user is requested in the dialog window to name and to save or to discard the recorded video message. Another dialog window allows the user to view the recording again. The new recorded video message appears in the list of available video messages (C) in the header. If several video message exist, they can be scrolled through using the operating elements (A).
If the recording does not correspond to the required results, it can be deleted by pressing the control surface "Waste bin" (J). The message is then deleted immediately.

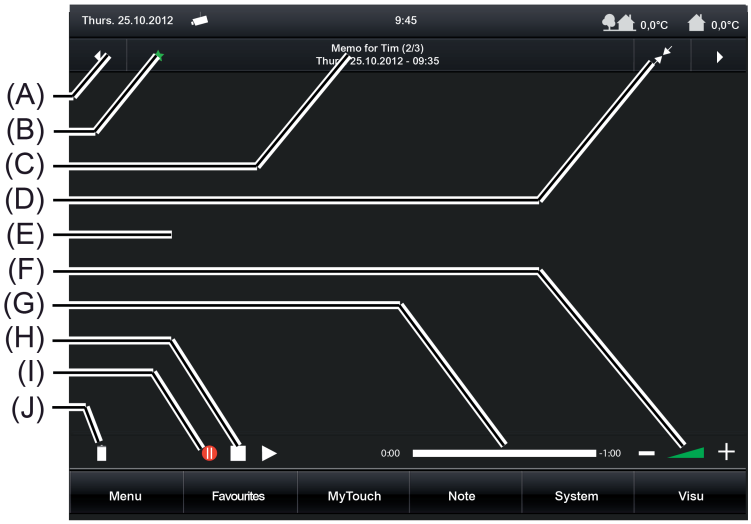


Figure 73: Example of a display page of the video recording mode

### 4.2.4.16.3 Playing back video messages

The camera symbol in the header of the display indicates that a video message that has not yet been viewed was saved. In the menu "Note", all saved messages are in the list of available video messages (C). These can be scrolled through using the operating elements (A). Messages that have not yet been viewed are marked with a green asterisk (B) (Figure 74).
The control surface "Start" (H) can be pressed to start a playback. The device then plays back the recorded video message immediately in the display area (E). It is possible to vary the volume of the audio playback using the operating elements (F).
The playback can be stopped before the replay time has elapsed by pressing the control surface "Stop" (I). Alternatively, a playback is stopped automatically when the playback time corresponds to the recording time.

Once a video message is no longer used, it can be removed from the device memory by pressing the control surface "Waste bin" (J). This operation must then be confirmed. The message is then deleted permanently from the device memory. This frees a memory location again that can be used for recording a new video message.

The playback mode can be exited by selecting another menu from the footer.

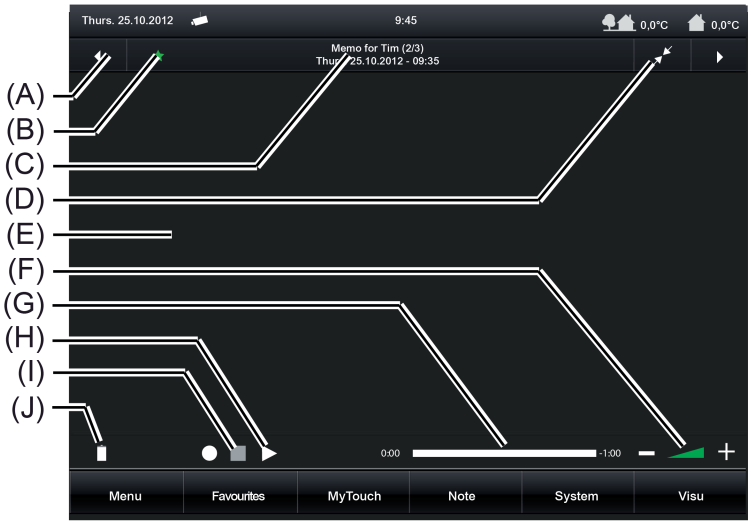


Figure 74: Example of a display page of the video playback mode

### 4.2.4.17 Standby behaviour

The device has a mains voltage terminal for power supply to the device electronics. The KNX function part (BCU) is functional as long as mains voltage and bus voltage are switched on. The device can be switched off to enable energy-saving operation, as in the case of prolonged absence for instance. When switching off, the operating system is shut down. The display and signalling functions of the device are then deactivated permanently.
The device can be switched off using the ON/OFF push-button on the device or alternatively in the Start menu of the operating system ("Shut Down"). It is only possible to switch on the device using the ON/OFF push-button.

i The start menu of the operating system is available via the Windows® taskbar. The taskbar is normally in the background and is therefore not visible. The taskbar can be accessed by connecting a USB keyboard.

Alternatively, the device can be shut down into standby mode via the Windows® start menu. Operating the touchscreen then immediately reactivates the device. Unlike switching off, the device in standby mode can also be reactivated by the KNX function part when an event occurs. The device is then able to perform display and signalling functions event-driven. A deactivated device cannot be reactivated by the KNX function part. Display and signalling functions are then deactivated permanently. The KNX function part (BCU) is functional in both cases provided that the mains voltage and bus voltage are available interruption-free.
The energy saving is approximately the same if the device is switched off or in standby mode.

The following KNX functions remain active even when the device is switched off or in standby mode...

- Signalling system
- Presence simulation
- Timer switch
- Logic functions
- Datalogger
- Fault messages

Incoming events of the listed functions with high priority (e.g. alarm of the signalling system, active fault message) can only be displayed by the device or acoustically signalled when the device is in standby mode. If such events arrive in standby mode, the operating system and the KNX application are reactivated automatically by the KNX function part. The device will then execute the display and signalling of the functions with high priority and also synchronise other events that have been logged since activating the standby mode. The KNX function part has an event memory for this purpose. If the event memory is completely full, the device will also be reactivated so that no stored event will be lost. In the event memory, the states of KNX display and operating functions are monitored among other things so that all display functions indicate the correct state of the KNX system.

i If the device was switched off, it cannot be reactivated automatically for the synchronisation as long as the event memory is full. In these cases, it is possible that stored events may be overwritten until the device is switched on again.

### 4.2.5 Parameters

| Description | Values | Comment |
|---|---|---|
| ☐↵ Visualization -> Pages -> Parameter Category "Function parameter" | | |
| Enable external open page | Checkbox: Yes / **No** | As an alternative or supplement to the internal open page, all pages can also be displayed by an external bus telegram per recall. For this purpose, each page optionally has its own 1-bit communication object. If this parameter, which is available separately for each display page that can be opened, is set ("Yes"), the object "external open page" becomes visible in the configuration software. As as soon as a "1"-telegram is received via this object during the running time of the device, the on-screen display switches over immediately to the corresponding display page. In this way, screen pages can be opened by other bus devices (e.g. by KNX presence detectors if a person is present in the room).<br>This parameter is only available for display pages that can be opened. |
| Password protection | **No password**<br>Level 1<br>Level 2<br>Level 3<br>Level 4 | The opening of pages can optionally be protected by a password. Up to 4 password levels are available for this in the device. To activate the password protection, a password level must be assigned here to a display page. The corresponding page will first then be displayed by an open page request (external or internal open page) if the correct password assigned to the level was entered. A keyboard is available on the screen for entering the password.<br>This parameter is only available for display pages that can be protected by a password.<br>The display page of the signalling system can be protected by its own password. In this case, the parameter has only one checkbox (Yes / No) that determines whether or not the password of the signalling system is active. |
| ☐↵ Visualization -> Pages -> Parameter Category "Display parameter" | | |
| Text | any text | Each display page can be provided with a text. This parameter defines the display text of a room or function page (e.g. "Living room" or "Datalogger"). Display pages of user and system settings can be labelled in this way as well.<br>The preset text depends on the display |

| | | |
|---|---|---|
| | | page selected. |
| Name as text | Checkbox: **Yes** / No | In the configuration software, display pages are displayed in the structure view. Tree nodes in the structure view correspond directly to the display pages. Tree nodes bear the display text of the pages for better identification. The standard display text is entered automatically in the name of the tree node when creating a page.<br>Optionally, the name of a tree node in the structure view can also vary from the display text of the page, however. This is is advisable, for instance, if pages in the configuration software should be identified continuously and described directly on the device in a user-friendly manner (e.g. name in the structure view: "Room 1" / Text in the visualization: "bedroom").<br>This parameter defines whether or not the text in the visualization is the same as the name in the configuration software. If the parameter is set ("Yes"), the texts are identical. If the parameter is not set ("No"), different texts can be defined for the display and for the name in the structure tree. The name in the structure tree can be edited by a soft click. |
| Icon | List of function unit icons (66 icons) | An icon can be assigned to each function unit page. The presetting of this parameter depends on the selected function unit. Newly created function units receive the icon "Living room". This parameter is only available for function unit pages. |

□↵ Visualization -> Building structure -> <Building section name> -> <Room name -> -> KNX functions -> Parameter category "Function parameter"

| | | |
|---|---|---|
| Function on actuation | **No function**<br>ON<br>OFF<br>Toggle | With the function "Switching" the response to an operation of the sensor element (starting to press) can be defined here. |
| Function on release | No function<br>ON<br>OFF<br>**Toggle** | With the function "Switching" the response to an operation of the sensor element (releasing) can be defined here. |
| Use feedback object | Checkbox: Yes / **No** | If this parameter is not selected ("No"), the transmitting communication objects of the function are bidirectional. The |

| | | |
|---|---|---|
| | | states received via the transmitting objects then influence the status indications. This is advisable, for instance, if the activated KNX switch actuator does not have any separate feedback objects. Alternatively, this parameter can be selected ("Yes") whereby the status elements are activated exclusively via the feedback objects.<br>This parameter is only available for KNX functions that allow the feedback objects to be hidden. |
| Time between short and long time operation | Time in ms, **400 ms** | In some functions, a distinction is made between short and long operations. The time which can be set here specifies from which actuation time the operating element evaluates a long operation. |
| Add keyboard | Checkbox: **Yes** / No | In some functions the transmission value can be preset using the on-screen keyboard. This parameter defines whether the on-screen keyboard can be used for value presetting (checkbox selected "Yes"). |
| Scene | **Undefined**<br>+ A selection of available internal scenes. | In the function "Scene recall", it is possible to define here which internal scene is recalled via an operation. |
| Data point type | **DPT 5.001...5.004**<br>DPT 5.010<br>DPT 6.010<br>DPT 7.001<br>DPT 8.001<br>DPT 9.001<br>DPT 12.001<br>DPT 13.001<br>DPT 14.000...14.079 | With the value transmitter functions telegrams in compliance with various KNX 1-byte, 2-byte and 4-byte data types can be transmitted to the bus. The activation of other bus devices enables the user with the 1-byte data formats, for example, to execute limiting value presettings or presettings for current counter statuses. With the 2-byte and 4-byte data formats it is possible to specify temperature or brightness values or to generate any preset values for other physical sizes with negative or positive signs.<br>A sensor operation triggers the value telegram defined in the configuration software (transmission value). The parameter "data point type" determines the data format of the value transmitter object. |
| Display format | **Percent (%)**<br>Degrees (°) | This parameter defines the display format of the value for the value |

| | | |
|---|---|---|
| | **User-defined** | transmitter functions. The settings "percent (%)" and "degree (°)" are only available with the "DPT 5.001...5.004". In "user-defined" the display format can be specified freely by the definition of an offset, factor and unit. |
| Offset | positive or negative number with decimal places, **0** | The value offset is set here for the value transmitter functions in a user-defined display format. |
| Factor | positive or negative number with decimal places, **1** | The value factor for the gain is set here for the value transmitter functions in a user-defined display format. |
| Transmission value | An adjustable positive or negative value, **0** depending on the predefined data type. | In the function "Value transmitter", a sensor operation triggers a telegram with a value defined by this parameter. It should be noted that the value transmitted via the communication object of the value transmitter can vary from the preset value during a sensor surface operation (presetting via transmission value in the configuration software or keyboard) because a gain factor and value offset can be configured optionally with some data types. |
| Minimum value | An adjustable positive or negative value depending on the predefined data type. | The parameters "Minimum value" and "Maximum value" scale the bar graph of the value transmitter functions and thus define the minimum and maximum displayable value. At full-scale deflection, the maximum value for the value range is set. If the bar graph shows no deflection, the minimum value is set. It should be noted that only values within the limits defined by these parameters can be specified via the on-screen keyboard or by a sensor surface operation.<br>The presetting of these parameters depends on the configured data type. |
| Maximum value | An adjustable positive or negative value depending on the predefined data type. | |
| Initial increment | An adjustable positive value depending on the predefined data type, **5** | In the "Value transmitter with adjustment function", the initial transmitter level (increment immediately after the operation) is configured by this parameter for a value adjustment. In the |

| | | |
|---|---|---|
| | | case of a value adjustment by a long button-press, the device first increases or decreases the value based on the initial increment. If the value adjustment lasts longer, the device increases the increment automatically so that the interval of the transmitted values becomes greater. Consequently, setpoints are reached faster. |
| Time between two telegrams | Time in ms, **1000 ms** | In the "Value transmitter with adjustment function", this parameter specifies the time interval of the telegrams during a value adjustment. |
| Time between long and short button-press | Time in ms, **1000 ms** | In the "Value transmitter with adjustment function", a distinction is made between short and long operations. The time which can be set here specifies from which actuation time the operating element evaluates a long operation (value adjustment). |
| Slat adjusting time | Time in ms, **600 ms** | A "slat adjusting time" can be configured with the function "Venetian blind Step / Move / Step". If the sensor element is kept depressed long, the device transmits a long time telegram for starting up the drive and starts the "slat adjusting time". If the sensor element is released again within the slat adjusting time, the device transmits another short time telegram. This function is used for adjusting the slats of a blind. The function permits stopping the slats in any position during their rotation. |
| Slat correction | Checkbox: Yes / **No** | The function of the "Venetian blind/ positioning" supports the supplementary function of the slat correction. Many KNX shutter actuators track the slat position when the shutter height changes due to a position setting. These actuators also reposition the slats when the blind position is preset to 0%, i.e. to the upper end position. This repositioning of the slats is often undesirable in the upper end position of the Venetian blind since the returned blind height also changes again due to the movement of the slats (position of blind unequal 0%).<br>To prevent the slat from being repositioned in the upper blind end position, the automatic slat correction can be activated here in the function |

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| | | "Venetian blind/ positioning". If the slat correction has been activated, the device always transmits a slat position of 0% for a blind height presetting of 0%. As a result, the slat is not repositioned when the upper end position is reached since this is already in the 0% position after the upward movement. It does not matter which operation performs the 0% presetting. |
| Frost protection selectable | Checkbox: **Yes** / No | In the functions "Operating mode switchover 4 x 1-bit" and "Operating mode switchover KNX" the possible operating modes (Comfort, Standby, Night reduction, Frost/heat protection) are selected via a dialog. It is possible to define which modes a user can select by a sensor surface operation by this parameter. |
| Comfort selectable | Checkbox: **Yes** / No | |
| Standby selectable | Checkbox: **Yes** / No | |
| Night reduction selectable | Checkbox: **Yes** / No | |
| Automatic operation selectable | Checkbox: **Yes** / No | The parameter "Automatic operation selectable" is only available for the function "Operating mode switchover KNX" and only when the switch-over affects the forced object on the controller. |
| Affects forced object | Checkbox: Yes / **No** | The "operating mode switchover KNX" can affect two objects on the room temperature controller. This will result in different functions.<br>"Affects forced object = Yes": The operating mode switchover affects the KNX forced object for the operating mode switchover on the controller (high priority). In this case, the sensor element can switch over the Operating modes "Comfort", "Standby", "Night reduction" and "Frost/heat protection" by means of forced presetting. This presetting of the operating mode is normally called "Forced operation" in KNX controllers and cannot be overridden by other functions. In addition, it is possible to activate the automatic mode by an operation of the sensor surface. The forced presetting is then deactivated and the controller switches over to the operating mode that was set in normal operation.<br>"Affects forced object = No": The operating mode switchover affects the normal KNX object for the operating |

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| | | mode switchover on the controller (low priority). In this case, the sensor element can switch over the operating modes "Comfort", "Standby", "Night reduction" and "Frost/heat protection". This presetting of the operating mode is normally called "Automatic mode" in KNX controllers and can be overridden by other functions with a higher priority (e.g. window status, KNX forced operating mode). |
| Time offset | -12...**0**...12 | In the function "Date / Time (system time) and "KNX time" the time display can be shifted hourly by a time offset to adjust the time to various time zones. This parameter is provided for this purpose. The set value defines the time shift directly in hours. |
| Channel to be evaluated | **1**...16 | In the function "collective feedback" the display element can display the switching state of an actuator channel. This parameter determines which channel of the collective feedback is evaluated. The display element only evaluates the specified channel in the collective feedback telegram. |
| On receipt of acoustic signal | Checkbox: Yes / **No** | Upon receipt of a text when using the function "ASCII text display", it is possible to optionally play back an audio file via the device's integrated loudspeaker. If the parameter "On receipt of acoustic signal" is set ("Yes"), the device will play back the audio file specified in the configuration software once in its full length for each new telegram. It is useful to use this acoustic display function if text displays should signal important events or states to the user of the device. In this case, it is advisable to use short and understandable signal tones. |
| Audio file | File in the format "*.wav"., **default.wav** | This parameter determines the audio file that is played back when a new text of the ASCII text display is received. This parameter is only available if the parameter "On receipt of acoustic signal" is set. |
| | Checkbox: Yes / **No** | Upon receipt of a value of the ASCII text display, the display will jump directly to |

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| Upon receipt switch on display illumination / display element | | the display page of the text display if this parameter is set ("Yes"). In this case, the display illumination is also switched to the work brightness. Otherwise ("No"), the updating of the text display element takes place in the background. |
| Disabling object available | Checkbox: Yes / **No** | With the function "ASCII text display" the acoustic signal and direct display of the text and switching on of the display illumination during the update can be suppressed - during the night for example - if necessary. The ASCII text display has its own disabling function for this purpose. As soon as the disabling function is active (telegram polarity configurable), the text display is still. The display element is then updated in the background.<br>This parameter enables the use of the disabling function. |
| Behaviour of disabling object | 1 = enabled /<br>0 = disabled<br><br>**0 = enabled /**<br>**1 = disabled** | This parameter defines the telegram polarity of the disabling object for the ASCII text display. This parameter is only available if the disabling function was enabled. |
| Target | **Back**<br>+ Selection of available display pages that allow a page jump. | In the function "Internal open page" the target of the open page is defined by this parameter. |

□↵ Visualization -> Building structure -> <Building section name> -> <Room name -> -> KNX functions -> Parameter category "Display parameter"

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| Text | any text | Each KNX function can be provided with a text. This parameter defines the display text of the function (e.g. "switch ceiling luminaire" or "Venetian blind window").<br>The preset text depends on the configured function. |
| Name as text | Checkbox: **Yes** / No | In the configuration software, KNX functions are displayed as tree nodes also in the structure view below the rooms or function units. Tree nodes bear the display text of the function for better identification. The standard display text is entered automatically in the name of the tree node when creating a KNX function.<br>Optionally, the name of a function node in the structure view can also vary from the display text, however. This is is |

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| | | advisable, for instance, if a KNX function in the configuration software should be described by its function and the data format and should be identified on the device in a user-friendly manner (e.g. name in the structure view: "Switching 1-bit" / Text in the visualization: "switch ceiling luminaire").<br>This parameter defines whether or not the text in the visualization is the same as the name in the configuration software. If the parameter is set ("Yes"), the texts are identical. If the parameter is not set ("No"), different texts can be defined for the display and for the name in the structure tree. The name in the structure tree can be edited by a soft click. |
| Function unit | No function unit<br>+ A selection of available function units. | Each KNX function can be allocated to a function unit. This parameter defines the allocation. The presetting depends on the KNX function selected. |
| Timer switching channel | No timer switching channel<br>+ A selection of available timer switch channels. | The assignment of the KNX function to a timer switching channel is determined here. |
| Display value | Checkbox: **Yes** / No | This parameter specifies whether or not the status text or value is displayed in the display element of the function. |
| Icon for 1<br>Icon for 0 | Icon selection, **Switch ON**<br>Icon selection, **Switch OFF** | Similarly to the status text, a symbol can be displayed in the display area. This parameter defines which status icon is used for the switching states "0" and "1" in the display element for the KNX function "Switching". This makes it possible to adapt the icon display to the activated function (e.g. switching of lighting). The status icon displays changes depending on the switching state thereby enabling the state of the controlled KNX function to be read clearly.<br>These parameters are only available for the function "Switching". |
| Image text for 1<br>Image text for 0 | Text (max. 25 characters), **ON**<br>Text (max. 25 characters), **OFF** | This parameter defines which status texts for the KNX function "Switching" are displayed for the states "0" and "1" in the display element. After a device reset, the display shows "---" until an |

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| | | object value of the status text "ON" is received or predefined.<br>These parameters are only available for the function "Switching". |
| Unit | Unit selection, **%** | With this parameter it is possible to configure the unit displayed behind the status value for the KNX functions "Value transmitter" and "Value transmitter adjustment function". This parameter is only available if the display format is preset to "user-defined". |
| Format | **#**<br>#.#<br>#.##<br>#.### | This parameter defines the formatting and thus the number of visible decimal places (if available) of the status value for the value transmitter functions. |
| Transmission allowed | Checkbox: **Yes** / No | With some functions it is possible to determine with this parameter whether a telegram is transmitted to the bus by an operation. The sending of a telegram by an operation can be prevented by deselection of the checkbox (only display function - a status text or value is always then displayed). |
| Image text for comfort mode | Text (max. 25 characters), **Comfort** | This parameter sets the status text for an active comfort mode for the KNX functions "Operating mode switchover 4 x 1-bit" and "Operating mode switchover KNX". |
| Image text for standby operation | Text (max. 25 characters), **Standby** | This parameter sets the status text for an active standby mode for the KNX functions "Operating mode switchover 4 x 1-bit" and "Operating mode switchover KNX". |
| Image text for night reduction | Text (max. 25 characters), **Night reduction** | This parameter sets the status text for an active night mode for the KNX functions "Operating mode switchover 4 x 1-bit" and "Operating mode switchover KNX". |
| Image text for frost/heat protection | Text (max. 25 characters), **Frost/heat protection** | This parameter sets the status text for an active frost/heat protection mode for the KNX functions "Operating mode switchover 4 x 1-bit" and "Operating mode switchover KNX". |

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| Image text for automatic mode | Text (max. 25 characters), **Automatic** | This parameter sets the status text for an automatic mode only for the KNX function "Operating mode switchover KNX" (for activation of a KNX forced object). |
| Display in favourites | Checkbox: Yes / **No** | This parameter defines whether the KNX function is assigned to the favourite page. If the parameter is set ("Yes"), the function is available on the favourite page. |

□↤ Datalogger -> <Datalogger-Channel>

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| Data type | DPT 5.001 … 5.004 (1 byte relative value)<br><br>DPT 5.010 (1 byte – counter)<br><br>DPT 6.010 (1 byte counter with plus/minus sign)<br><br>DPT 7.001 (2 byte – counter)<br><br>DPT 8.001 (2 byte – counter with plus/minus sign)<br><br>DPT 9.001 … 9.021 (2 byte – value)<br><br>DPT 12.001 (4 byte – counter)<br><br>DPT 13.001 (4 byte counter with plus/minus sign)<br><br>DPT 14.000 … 14.079 (4 byte – IEEE float) | The datatype of the datalogger channel can be set here. |
| Interval time | **Minute**<br>Hour<br>Day<br>Week<br>Month | Telegrams reaching the communication object are divided into various time intervals and assigned to them. At the end of each time period, the telegrams received are evaluated and a minimum and maximum interval value determined. In addition, an average value is calculated and saved. To evaluate a differential calculation, the last respective data value of an interval is also saved. The smallest and largest values are evaluated as the minimum and maximum values. To calculate the |

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| | | average, the recorded values are totalled and divided by the number of recorded values. If, within a time period, only one telegram data value was received, then the minimum value = maximum value = average value.<br>The time interval for the detection of data telegrams can be configured separately by this parameter. |
| Poll cyclically | Checkbox: Yes / **No** | With activated cyclic polling, the device transmits a value read telegram (ValueRead) to the bus regularly, after a period of time has elapsed. The data source must then return a value response telegram (ValueResponse). The "Read" flag must be set on the transmitting object of the data source for this to function correctly. |
| Poll interval | * | The polling interval of the cyclic object poll can be set here.<br>This parameter is only visible on "Poll cyclically = Yes".<br>*: The setting options automatically align themselves to the configured interval time. This ensures that at least one data value is requested within a time period. |
| Specify start value for difference formation | Checkbox: Yes / **No** | If the data source is a counter (e.g. electricity meter, people counter, etc.), the data display in the value-time diagram can be configured to differential calculation. A difference between the last value to arrive of the current interval and the last valued of the previous interval - depending on minimum, maximum or average value - is calculated here and displayed as a differential value, provided that the diagram is configured to differential display.<br>If a starting value is used, the device then directly evaluates the last data value of the first time period after the reset and then shows the difference in relation to the starting value in the display diagram. In no start value for differential calculation is configured, the device automatically evaluates the first data value received as the start value. |
| Start value for difference formation | **0** | After a device reset (power failure, programming operation), the differential calculation starts at a specified starting value. This is required to initialise the |

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| | | differential formation, so that a differential value can be calculated in the first recording period after a reset. This means that, in addition, there can be an adjustment to defined basic counter levels - for example after the installation of a new electricity meter. The system project planner must enter the starting value here if the parameter "Specify start value for difference formation" is set ("Yes"). |
| Send e-mail on memory overflow | Checkbox: Yes / **No** | If the device is connected to a network via an Ethernet connection and an e-mail account is also configured to send e-mail messages, the data values recorded by a datalogger channel can be sent cyclically by e-mail. In this case, the device prepares the data in a CSV file and sends it to a specified receiver in a standard e-mail.<br>The e-mail is sent automatically each time the number of data records stored in the file system reaches 10,000. A data record consists of the minimum value, maximum value, average value and the last value (for calculating a difference) of a time interval. |
| Recipient address | No presetting | The e-mail address of the recipient of the automatically generated datalogger e-mail message must be configured here. The input format of the address is specified as "local@domain" (example: "xxx@yyy.de").<br>This parameter is only visible on "Send e-mail on memory overflow = Yes". |

□↵ Visualization -> Menu -> Datalogger -> <Datalogger Diagram> -> Parameter Category "Function parameter"

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| Y axis: Scaling | **Automatic**<br>Manual | The Y axis can be scaled automatically according to the values to be displayed (specified by minimum and maximum values of the recording period / "Automatic" setting) or, alternatively, can be permanently configured in a value range ("Manual" setting). If the scaling of the Y axis is fixed, and there is a data value outside the specified minimum or maximum limits, then the data value curve is drawn in vertically upwards or downwards from the two neighbouring data points. |
| | **0** | |

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| Y axis:<br>Min. axis scaling | | The lower minimum value of the Y axis can be defined at this point. The value may be either positive or negative, but may not exceed the maximum value. During setting, it should be ensured that the expected datalogger values do not undershoot the minimum value. Otherwise the data value curve would be drawn vertically downward from the two neighbouring data points of the undershoot.<br>This parameter is only visible on "Y axis: scaling = manual". |
| Y axis:<br>Max. axis scaling | **100** | The upper maximum value of the Y axis can be defined at this point. The value may be either positive or negative, but may not undershoot the minimum value. During setting, it should be ensured that the expected datalogger values do not exceed the maximum value. Otherwise the data value curve would be drawn vertically upward from the two neighbouring data points of the overshoot.<br>This parameter is only visible on "Y axis: scaling = manual". |
| Number of subdivisions | 1...**5**...10 | The Y axis can be given subdivisions to simplify the legibility of the diagram. This parameter specifies the number of subdivisions. |
| Curve 1 | ---<br>...<br>Selection list of the datalogger channels | The datalogger channel of the first curve to be displayed is selected here. In a display element, only those channels with the same interval times can be displayed. The selection of the parameter adapts itself accordingly.<br>For a selection to be possible here, at least one datalogger channel must have been added in the structure view in the area "Datalogger" in advance. |
| Colour | Colour selection | A datalogger diagram can display the measured values of up to three datalogger channels in curve format. Each curve is represented in its own colour. On the bottom edge of the display element in the form of a legend the configurable curve colours are displayed here supplemented by the name of the curve. This allows better identification of the curves.<br>The legend is only visible when the parameter "Display legend" is selected |

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| | | in the display parameters. |
| Name | Text | A datalogger diagram can display the measured values of up to three datalogger channels in curve format. Each curve is represented in its own colour. On the bottom edge of the display element in the form of a legend the individual curve colours are displayed here supplemented by the configurable name of the curve. This allows better identification of the curves. The legend is only visible when the parameter "Display legend" is selected in the display parameters. |
| Amplification | **1** | Reinforcement (multiplicator) can be added to the measured values of a channel to allow the option of modification to the desired measured value ranges in the diagram. |
| Offset | **0** | A static offset can be added to the measured values of a channel to allow the option of modification to the desired measured value ranges in the diagram. An offset not equal to "0" shifts the curve along the Y axis in a positive or negative direction. |
| Curve type | **Average**<br>Minimum<br>Maximum<br>Difference value | The data values received from the bus are transmitted to the datalogger display as minimum, maximum and average values by the KNX function part (BCU) at the end of a time interval. To calculate the differential value, the last respective value of a time interval is also forwarded to the display. The smallest and largest values are evaluated as the minimum and maximum values. To calculate the average, the recorded values are totalled and divided by the number of recorded values. If, within a time period, only one telegram data value was received, then the minimum value = maximum value = average value. When displaying a differential value, a difference between the last value to arrive of the current interval and the last value of the previous interval - depending on minimum, maximum or average values - is calculated and displayed as a differential value.<br>This parameter specifies which recorded data value is to be displayed in the diagram as the "curve type" (differential |

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| | | value, maximum value, minimum value or average value). |
| Curves 2 and 3 like curve 1! | | |

☐↵ Visualization -> Menu -> Datalogger -> <Datalogger Diagram> -> Parameter Category "Display parameter"

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| Display legend | Checkbox: **Yes** / No | A datalogger diagram can display the measured values of up to three datalogger channels in curve format. Each curve is represented in its own colour. On the bottom edge of the display element in the form of a legend the curve colours are displayed supplemented by the name of the curve. This allows better identification of the curves.<br>This parameter determines whether the legend is visible or not. |
| Y axis:<br>Display axis title | Checkbox: **Yes** / No | The Y axis of the graphic display can be described by a heading. This parameter defines whether the text heading of the Y axis should be displayed in the diagram. |
| Y axis:<br>Axis title | Text | The Y axis title is specified here. This parameter is only visible when the axis title of the Y axis is to be displayed. |
| Y axis:<br>Display axis labelling | Checkbox: **Yes** / No | The axis labelling of the Y axis can be shown or hidden. With axis labelling, only the subdivisions and additional lines are shown, but not the numeric values of the scale (minimum and maximum value). |
| Y axis:<br>Axis labelling format | **#,#** | This parameter can be used to specify the format of the displayed numeric values of the Y axis scale.<br>This parameter is only visible on "Y axis: display axis labelling = No". |

☐↵ Logic Editor -> Logic gate -> <Logic gate>

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| Identifier | **Input**, Text | Predefined designation that only appears in the configuration software, identifies an input more exactly and can be modified as required. |

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| Behaviour input | **Normal**<br>inverted | It is possible to specify here whether the appropriate gate input is evaluated normally, i.e. not inverted, or inverted. |
| Logic operation | **AND**<br>OR<br>Exclusive OR<br>AND with feedback | This parameter defines the logical link function.<br>With an "AND with return", the value of the output is fed back internally to input 1. The result of this is that the output can only have the value "1" when all the other inputs are set to "1" and input 1 receives the value "1" as the last input.. |
| Transmit on | **Each input event**<br>Change the output | In the "Transmit on each input event" setting, a new output telegram is sent when the value of the output has not changed on updating or a change to an input. When multiple logic gates are used, this can lead to a higher bus load.<br>In the "Transmit on output change" setting, the bus load is minimised by only transmitting the output telegram when the switching state has also changed. |
| Filter | **No**<br>Only transmit 1-telegrams<br>Only transmit 0-telegrams | A filter function can be optionally activated for the output at this point. The filter function set here specifies which output telegrams are transmitted to the bus and are thus forwarded. |
| Behaviour output | **Normal**<br>inverted | It is possible to specify here whether the gate output is evaluated normally, i.e. not inverted, or inverted. |
| Switch-on delay | Checkbox: Yes / **No** | A switch-on delay can be configured if required. Depending on the set time, telegrams of the output are transmitted to the bus after a delay depending on the result of the logical link ("1"-telegram). This function is used for suppressing brief changes in the status. A change in the status is not transmitted to the bus if the status should change once again within a time delay. |
| Switch-on delay time | 1...255 x 100 ms<br>**1**...255 x **1 second**<br>1...255 x 1 minute | The time of the switch-on delay is defined here. This parameter is only visible if the switch-on delay is active. |

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| Switch-off delay | Checkbox: Yes / **No** | A switch-off delay can be configured if required. Depending on the set time, telegrams of the output are transmitted to the bus after a delay depending on the result of the logical link ("0"-telegram). This function is used for suppressing brief changes in the status. A change in the status is not transmitted to the bus if the status should change once again within a time delay. |
| Switch-off delay time | 1...255 x 100 ms<br>**1**...255 x **1 second**<br>1...255 x 1 minute | The time of the switch-off delay is defined here. This parameter is only visible if the switch-off delay is active. |
| Activate cyclical transmission | Checkbox: Yes / **No** | Optionally, the output of a logic gate can transmit the status cyclically to the bus (e.g. for telegram monitoring in actuators). An output only transmits cyclically if the filter criterion is met (see above) In the case of configured switch on / or switch off delays, the status of the cyclical telegram first changes after a logical change in status after the delay time has elapsed. |
| Disabling object available | Yes<br>**No** | The logic gate can optionally be fitted with a disabling object. If the disabling object is used, the gate ignores changes to the inputs when the disabling is active. |
| Behaviour of disabling object | 1 = enabled /<br>0 = disabled<br><br>**0 = enabled /**<br>**1 = disabled** | The telegram polarity of the disabling object can be set here.<br>This parameter is only visible on "disabling object available = Yes". |
| Transmit after disabling is enabled | Checkbox: Yes / **No** | After the block, the current input values can immediately be processed further ("Yes" setting), or the logic gate waits for the next input telegrams ("No" setting).<br>This parameter is only visible on "disabling object available = Yes". |

□↵ Logic Editor -> Demultiplexer 1to2 / Demultiplexer 1to4 -> <Demultiplexer>

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| Object type Input/Output | DPT 1.001 (1 bit switching)<br><br>DPT 3.007 (4 bit – dimming) | The input and the outputs of a multiplexer channel always have the same object type, which can be configured here. Different channels of a |

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| | | multiplexer may user different object types. |
| | DPT 5.001 … 5.004 (1 byte relative value)<br><br>DPT 5.010 (1 byte – counter)<br><br>DPT 6.010 (1 byte counter with plus/minus sign)<br><br>DPT 7.001 (2 byte – counter)<br><br>DPT 8.001 (2 byte – counter with plus/minus sign)<br><br>DPT 9.001 … 9.021 (2 byte – value)<br><br>DPT 12.001 (4 byte – counter)<br><br>DPT 13.001 (4 byte counter with plus/minus sign)<br><br>DPT 14.000 … 14.079 (4 byte – IEEE float) | |
| Disabling object available | Checkbox: Yes / **No** | The multiplexer can optionally be fitted with a disabling object. During a block. no values are forwarded from the input to the outputs. |
| Behaviour of disabling object | 1 = enabled /<br>0 = disabled<br><br>**0 = enabled /**<br>**1 = disabled** | The telegram polarity of the disabling object can be set here.<br>This parameter is only visible on "disabling object available = Yes". |
| Transmit after disabling is enabled | Checkbox: Yes / **No** | After the block, the current input value can immediately be processed further ("Yes" setting), or the multiplexer waits for the next input telegrams ("No" setting).<br>This parameter is only visible on "disabling object available = Yes". |
| ☐↵ Logic Editor -> Timers -> <Timer> | | |
| Filter ON -> | ---<br>**ON**<br>OFF<br>Toggle | This parameter defines the filter function for the input telegram value "1" (ON).<br>The timer filters or transforms the input value depending on this setting. |
| Filter OFF -> | | |

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| | ---<br>ON<br>**OFF**<br>Toggle | This parameter defines the filter function for the input telegram value "0" (OFF). The timer filters or transforms the input value depending on this setting. |
| Switch-on delay | Checkbox: Yes / **No** | A switch-on delay can be configured if required. Depending on the set time, the filtered input telegrams are then forwarded to the output with the value "1" (ON) after a delay. |
| Switch-on delay time | 1...255 x 100 ms<br>**1**...255 x **1 second**<br>1...255 x 1 minute | The time of the switch-on delay is defined here. This parameter is only visible if the switch-on delay is active. |
| Switch-off delay | Checkbox: Yes / **No** | A switch-off delay can be configured if required. Depending on the set time, the filtered input telegrams are then forwarded to the output with the value "0" (OFF) after a delay. |
| Switch-off delay time | 1...255 x 100 ms<br>**1**...255 x **1 second**<br>1...255 x 1 minute | The time of the switch-off delay is defined here. This parameter is only visible if the switch-off delay is active. |
| Disabling object available | Checkbox: Yes / **No** | The filtering/timer can also be fitted with a disabling object. If the disabling object is used, the timer ignores changes to the input when the disabling is active. |
| Behaviour of disabling object | 1 = enabled /<br>0 = disabled<br><br>**0 = enabled /**<br>**1 = disabled** | The telegram polarity of the disabling object can be set here.<br>This parameter is only visible on "disabling object available = Yes". |
| Transmit after disabling is enabled | Checkbox: Yes / **No** | After the block, the current input value can immediately be processed further ("Yes" setting), or the timer waits for the next input telegram ("No" setting).<br>This parameter is only visible on "disabling object available = Yes". |

☐↵ Logic Editor -> Limiting values -> <Limiting value>

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| Datapoint type | DPT 5.001 … 5.004 (1 byte relative value)<br><br>DPT 5.010 (1 byte – counter) | The device allows the limiting value monitoring of 1-byte, 2-byte and 4-byte values in different data formats. This parameter defines the data format of the limiting value input object. |

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| | DPT 6.010 (1 byte counter with plus/minus sign)<br><br>DPT 7.001 (2 byte – counter)<br><br>DPT 8.001 (2 byte – counter with plus/minus sign)<br><br>DPT 9.001 … 9.021 (2 byte – value)<br><br>DPT 12.001 (4 byte – counter)<br><br>DPT 13.001 (4 byte counter with plus/minus sign)<br><br>DPT 14.000 … 14.079 (4 byte – IEEE float) | |
| Display format | **Percent (%)**<br>Degrees (°)<br>User-defined | With the datapoint type "DPT 5.001...5.004" the display format for representing the user settings directly on the device can be defined by this parameter. In the case of all other data point types, the display format is preset to "user-defined". |
| Offset | **0** | Setting of the value offset for formatting the user settings directly on the device in the case of user-defined display format. |
| Factor | **1** | Setting of the value gain for formatting the user settings directly on the device in the case of user-defined display format. |
| Format | **#**<br>#,#<br>#,##<br>#,### | Setting of the visible decimal places for formatting the user settings directly on the device in the case of user-defined display format. |
| Unit | **%**, Unit selection | Setting of the unit of the editable value for formatting the user settings directly on the device in the case of user-defined display format. |
| Transmit limiting value on initialisation | Checkbox: Yes / **No** | If this parameter is set, the device evaluates the input value immediately after a device reset (commissioning |

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| | | operation or bus voltage return) and initialises the 1-bit limiting value objects. Consequently, the 1-bit limiting value objects also send the current state to the bus. |
| Upper limiting value active | Checkbox: **Yes** / No | This parameter can define whether the input value is monitored at an upper limit. |
| Upper limiting value | Value dependent on the datapoint type | This parameter defines the upper limiting value to be monitored if this is activated. The lower limiting value predefined here can be changed directly on the device in the user and system settings at any time and can therefore be adapted to individual needs or requirements. The formatting of the value in the input field of the configuration software and in the presetting during the course of the user settings directly on the device is defined by the lower level parameters of the data point type (offset, factor, format). |
| Hysteresis upper limiting value | **0** | A hysteresis is assigned to each limiting value. The hysteresis serves to prevent frequent switching backwards and forwards when there is a measured value in the approximate area of the limiting value. The setting "0" deactivates the hysteresis. In the case of the upper limiting value, the hysteresis is deducted from the limiting value. The hysteresis - like the limiting value itself - is an absolute value and is only defined in the configuration software. |
| Behaviour on exceeding upper limiting value | No action<br>**1 telegram**<br>0 telegram | This parameter defines the switching command transmitted to the bus via the object 1-bit limiting value object. The device compares the current input value continuously with the set upper limiting value and decides on this basis whether the configured switching command should be transmitted if the upper limiting value is exceeded at this point. |
| Behaviour on not reaching upper limiting value – hysteresis | No action<br>1 telegram<br>**0 telegram** | This parameter defines the switching command transmitted to the bus via the object 1-bit limiting value object. The device compares the current input value continuously with the set upper limiting |

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| | | value and the corresponding hysteresis and decides on this basis whether the configured switching command should be transmitted minus the hysteresis if the upper limiting value is fallen short of at this point. |
| Transmission delay upper limiting value | **No delay**<br>1 s, 3 s, 5 s,<br>10 s, 15 s, 30 s,<br>1 min., 3 min., 5 min.,<br>10 min., 15 min., 30 min.,<br>60 mins. | The switching telegrams of the upper limiting value object can be transmitted to the bus after a delay if required. This function is used for suppressing brief changes in the status. A change in the status is not transmitted to the bus if the status should change once again within a time delay. |
| Upper limiting value changeable | Checkbox: Yes / **No** | The upper limiting value can be changed directly on the device in the user and system settings and can therefore be adapted to individual needs or requirements. This is only possible, however, if the upper limiting value in the configuration software is configured here as changeable. |
| Upper limiting value changeable externally | Checkbox: Yes / **No** | The upper limiting value can also be optionally changed externally via a communication object. If this parameter is set, a communication object is also available that can change the upper limiting value during the running time of the device. The data format of this object corresponds to the datapoint type of the limiting value set in the configuration software. |
| Lower limiting value active | Checkbox: **Yes** / No | This parameter can define whether the input value is monitored at a lower limit. |
| Lower limiting value | Value dependent on the datapoint type | This parameter defines the lower limiting value to be monitored if this is activated. The lower limiting value predefined here can be changed directly on the device in the user and system settings at any time and can therefore be adapted to individual needs or requirements. The formatting of the value in the input field of the configuration software and in the presetting during the course of the user settings directly on the device is defined by the lower level parameters of the data point type (offset, factor, format). |

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| Hysteresis of lower limiting value | **0** | A hysteresis is assigned to each limiting value. The hysteresis serves to prevent frequent switching backwards and forwards when there is a measured value in the approximate area of the limiting value. The setting "0" deactivates the hysteresis. In the case of the lower limiting value, the hysteresis is added to the limiting value. The hysteresis - like the limiting value itself - is an absolute value and is only defined in the configuration software. |
| Behaviour on not reaching lower limiting value | No action<br>**1 telegram**<br>0 telegram | This parameter defines the switching command transmitted to the bus via the object 1-bit limiting value object. The device compares the current input value continuously with the set lower limiting value and decides on this basis whether the configured switching command should be transmitted if the lower limiting value is fallen short of at this point. |
| Behaviour on exceeding the lower limiting value + hysteresis | No action<br>1 telegram<br>**0 telegram** | This parameter defines the switching command transmitted to the bus via the object 1-bit limiting value object. The device compares the current input value continuously with the set lower limiting value and the corresponding hysteresis and decides on this basis whether the configured switching command should be transmitted in addition to the hysteresis if the lower limiting value is exceeded at this point. |
| Transmission delay lower limiting value | **No delay**<br>1 s, 3 s, 5 s,<br>10 s, 15 s, 30 s,<br>1 min., 3 min., 5 min.,<br>10 min., 15 min., 30 min.,<br>60 mins. | The switching telegrams of the lower limiting value object can be transmitted to the bus after a delay if required. This function is used for suppressing brief changes in the status. A change in the status is not transmitted to the bus if the status should change once again within a time delay. |
| Lower limiting value changeable | Checkbox: Yes / **No** | The lower limiting value can be changed directly on the device in the user and system settings and can therefore be adapted to individual needs or requirements. This is only possible, however, if the lower limiting value in the configuration software is configured here as changeable. |

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| Lower limiting value changeable externally | Checkbox: Yes / **No** | The lower limiting value can also be optionally changed externally via a communication object. If this parameter is set, a communication object is also available that can change the lower limiting value during the running time of the device. The data format of this object corresponds to the datapoint type of the limiting value set in the configuration software. |

☐↵ Timer -> Timer - Global settings

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| Astro: geographic longitude of the location | **9.5** | For the astro function of the timer switch to work correctly, the geographic position must be set. This parameter defines the geographic position (longitude) of the installation location of the device. |
| Astro: Geographic latitude of the location | **51.31** | For the astro function of the timer switch to work correctly, the geographic position must be set. This parameter defines the geographic position (latitude) of the installation location of the device. |
| Time for synchronisation of the switching times | **00:00**...23:59 | The KNX function part executes the timer commands independently. To ensure that it can also do this, the KNX function part needs regular information regarding the switching times that were last programmed by the installation engineer or user when the operating system and thus the KNX application are in standby mode. The KNX function part can temporarily store and execute the switching times every 24 hours. If the temporarily stored switching times have been executed, the KNX function part must be resynchronised with switching times. The synchronisation takes place cyclically depending on the time of day, or when the KNX module has executed all switching times in one day.<br>The time of the day when the recurrent synchronisation should take place can be defined here. The parameter "Time for synchronisation of the switching times" defines the time for the synchronisation process regardless of whether or not the KNX module still has switching times. In addition, the KNX module requests switching times automatically if it has executed all switching times in one day. |

□↵ Timer -> Timer - Global settings -> <timer switch channel >

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| Type of timer switching channel | **Switching**<br><br>Operating mode switchover 4 x 1 bit<br><br>Operating mode switchover KNX<br><br>Scene<br><br>DPT 5.001 … 5.004 (1 byte relative value)<br><br>DPT 5.010 (1 byte – counter)<br><br>DPT 6.010 (1 byte counter with plus/minus sign)<br><br>DPT 7.001 (2 byte – counter)<br><br>DPT 8.001 (2 byte – counter with plus/minus sign)<br><br>DPT 9.001 … 9.021 (2 byte – value)<br><br>DPT 12.001 (4 byte – counter)<br><br>DPT 13.001 (4 byte counter with plus/minus sign)<br><br>DPT 14.000 … 14.079 (4 byte – IEEE float) | The switching times of a timer switch channel directly affect the communication objects of the channel and handle the data format defined here. |
| Random: max. time offset [min.] | **0**...30 | The switching times of a channel can be triggered offset in a set random period. Each day at 00:00, the device calculates a time offset individually and randomly for each switching time, by which a switching time is brought forward minute-by-minute (-) or is set back (+). The maximum time offset between the set switching time and the actual time of the version can be configured using this parameter. This allows time offsets of between 1 and 30 minutes. The setting "0" for the time offset completely deactivates the random function for the timer switch channel. The device randomly determines a time from the configured maximum time offset and adds this time either to the set switching time or, alternatively, subtracts it from the switching time. |

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| Astro: Channel affects | Shadow<br>**Lighting** | The astro function allows the control of a lighting or shading system depending on sunrise and sunset and a limit time (switching time).<br>An astro function usually affects lighting (e.g. exterior lighting) or shading (e.g. roller shutters). The behaviour of the device when processing the astro switching times varies according to these applications. This parameter defines the astro behaviour irrespective of the set data format of the channel. |
| Astro: Offset morning [min.] | -120...**0**...120 | Optionally, the astro time for the morning determined by the device can be statically shifted in the minute range. Thus, the switching times influenced by astro can be individually adapted to local conditions (e.g. influence by high mountains or forests).<br>This parameter defines the astro time shift during the morning. |
| Astro: Offset evening [min.] | -120...**0**...120 | Optionally, the astro time for the evening determined by the device can be statically shifted in the minute range. Thus, the switching times influenced by astro can be individually adapted to local conditions (e.g. influence by high mountains or forests).<br>This parameter defines the astro time shift during the evening. |
| Disabling object available | Yes<br>**No** | A disabling object is optionally available for every timer switch channel. Timer switch channels can be locked via the disabling objects during the running time of the device. In these cases, the objects of the timer switch channels do not transmit when a switching time occurs. |
| Behaviour of disabling object | 1 = enabled /<br>0 = disabled<br><br>**0 = enabled /**<br>**1 = disabled** | The telegram polarity of the disabling object can be set here.<br>This parameter is only visible on "disabling object available = Yes". |
| Transmit after disabling is enabled | Checkbox: Yes / **No** | If the parameter "Transmit after disabling is enabled" is set, the device evaluates the configured switching times upon re-enabling. If one or more |

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| | | switching times were not executed during the previously active disable phase, the device carries out the execution of the last switching time and transmits a corresponding telegram to the bus via the communication object of the timer switch channel. If the parameter "Transmit after disabling is enabled" is not set, the switching times will be ignored upon re-enabling. In this case, switching times skipped by the disabling function are not carried out. |
| ☐↵ E-Mail -> Event Mails -> <Event Mail> | | |
| Send e-mail on | 0 telegram<br>**1 telegram** | "Definition of the telegram polarity for the object of the corresponding event e-mail. The e-mail is sent when a telegram is received with the polarity defined at this point. Telegrams with another polarity are rejected. |
| Receiver | **Recipient**, Text | Specification of the e-mail address of a recipient of the event e-mail. The standard input format of the address is specified as "local@domain" (example: "xxx@yyy.de"). |
| Subject | **Subject**, Text | "Specification of the subject text of the event e-mail (e.g. "Signalling system fault", "Heater frost protection", etc.). The text may be a maximum of 20 characters in length. |
| Message | **Message**, Text | Specification of the the text contents of the event e-mail. The specified contents text is later transmitted to the mail server as 'plain text' in the event mail, and is displayed in the same manner, without special formatting, when the message is opened. |
| ☐↵ Signalling system -> Global settings | | |
| Arming acknowledgement time [s] | 2...**3**...255 | This parameter specifies the acknowledgement time for system arming. Acknowledgement takes place using the "Arming acknowledgement" object and, in the case of external arming, additionally using the visual alarm (depending on the parameter "Optical acknowledgement for external arming").<br>It is possible to cancel arming acknowledgement by unarming before |

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| | | the arming acknowledgement time has elapsed. |
| Unarming acknowledgement time [s] | 2...**3**...255 | This parameter specifies the acknowledgement time for system unarming. Acknowledgement takes place using the "Unarming acknowledgement" object.<br>It is possible to cancel arming acknowledgement by unarming before the arming acknowledgement time has elapsed. |
| Switching time, internal siren [s] | 2...**90**...255 | If a detector within an armed area responds, or a sabotage detector triggers when armed or any detector is found to be missing, the signalling system switches to the "Alarm" status and activates the internal siren. The internal siren is an alarm encoder activated for a set period of time. The system project planner must set the switching length of the internal siren here.<br>The signalling system automatically deactivates the internal siren when the switching time after the triggering of an alarm has elapsed. |
| Detector poll interval [s] | 2...**10**...255 | The signalling system checks that the detectors created in the security areas exist, i.e. that they are still connected to the KNX system and are functioning. The "Detector poll interval", which can be set in this parameter, defines the time between two read telegrams of the panel, i.e. the time between two detector tests. The signalling system polls all the created detector inputs in turn in this way.<br>Example: poll interval: 10 s, 40 detectors have been created. -> A detector is polled every 10 s. After approx. 400 s, all the detectors have been tested. After this, the cycle test is continued again with the first detector.<br>The signalling system tests detectors considered missing cyclically at brief intervals, in order to be able to detect quickly whether or not the detector has reconnected. |
| Function visible | Checkbox: **Yes** / No | The display page of the signalling system can be hidden optionally from the visualisation. If this is desirable or necessary, the parameter "Function |

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| | | visible" must be deselected in the configuration software in the global settings of the signalling system. The signalling system is then no longer accessible via the predefined menu structures of the visualisation. It can then only be accessed by means of internal open pages and operated via the communication objects. |
| Internal arming via the signal page | Checkbox: **Yes** / No | The system can be internally armed or unarmed using a display element on the "Signalling system" screen page. This parameter can be used to hide the display element for internal arming ("No" setting), so that the system can only be internally armed or unarmed using the appropriate communication object. |
| External arming via the signal page | Checkbox: **Yes** / No | The system can be externally armed or unarmed using a display element on the "Signalling system" screen page. This parameter can be used to hide the display element for external arming ("No" setting), so that the system can only be externally armed or unarmed using the appropriate communication object. |
| Arming delay, internal [s] | **0**...255 | The arming delay time, which can be set here, specifies after what time after an arming command ("1" telegram via the "Internally armed" object or pressing of the "Arm" button) the system is actually internally armed. In so doing the signalling system only checks the arming readiness of the security areas after the delay time has elapsed. Should a detector still be active at the end of the arming delay, (e.g. window opened), then arming does not take place.<br>An elapsing arming delay can be cancelled at any time by unarming.<br>The setting "0 s" deactivates the arming delay for the internal arming operation.<br>When setting the time, a time reserve should be planned, so that the user is still able to leave the building area to be secured correctly before actual arming. |
| Alarm delay time, internal [s] | **0**...255 | An alarm delay can optionally be configured for the internal arming. An alarm delay is often used when the switching device (e.g. the device or a button sensor) is installed in the secure |

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| | | area. In such cases, authorised people must be able to enter the secured building area, meaning the status the switching device for unarming can only be reached after a delay.<br>This parameter sets the internal alarm delay time. The setting "0 s" deactivates the alarm delay for the internal arming operation. |
| Prealarm, internal | **No**<br>Via internal buzzer<br>Via object<br>Via object and internal buzzer | Optionally, if an internal alarm delay time is running during system operation, a "Prealarm" can be activated first. Depending on the parameter configuration, a prealarm is signalled here by the acoustic signal generator of the device and/or a separate 1-bit object.<br>During a prealarm, an authorised person can unarm the system without triggering a 'real' alarm. The transition to the "Alarm" status only takes place is the system is not unarmed during the prealarm.<br>This parameter only has an effect when an internal alarm delay time is configured to greater than "0 s". |
| Arming delay, external [s] | **0**...255 | The arming delay time, which can be set here, specifies after what time after an arming command ("1" telegram via the "Externally armed" object or pressing of the "Arm" button) the system is actually externally armed. In so doing the signalling system only checks the arming readiness of the security areas after the delay time has elapsed. Should a detector still be active at the end of the arming delay, (e.g. front door not closed or window opened), then arming does not take place.<br>An elapsing arming delay can be cancelled at any time by unarming.<br>The setting "0 s" deactivates the arming delay for the external arming operation.<br>When setting the time, a time reserve should be planned, so that the user is still able to leave the building to be secured correctly before actual arming. |
| Alarm delay time, external [s] | **0**...255 | An alarm delay can optionally be configured for internal and external arming. An alarm delay is often used when the switching device (e.g. the device or a button sensor) is installed in the secure area. In such cases, authorised people must be able to enter the secured building area, meaning the |

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| | | status the switching device for unarming can only be reached after a delay.<br>This parameter sets the external alarm delay time. The setting "0 s" deactivates the alarm delay for the external arming operation. |
| Prealarm, external | **No**<br>Via internal buzzer<br>Via object<br>Via object and internal buzzer | Optionally, if an external alarm delay time is running during system operation, a "Prealarm" can be activated first. Depending on the parameter configuration, a prealarm is signalled here by the acoustic signal generator of the device and/or a separate 1-bit object.<br>During a prealarm, an authorised person can unarm the system without triggering a 'real' alarm. The transition to the "Alarm" status only takes place is the system is not unarmed during the prealarm.<br>This parameter only has an effect when an external alarm delay time is configured to greater than "0 s". |
| Visual acknowledgement on external arming | Checkbox: **Yes** / No | If the system has armed successfully, acknowledgement may take place via the visual signal encoder. This means that it is possible to detect clearly whether the system has responded to an arm command as required or not. This is particularly important when the system is operated remotely - without seeing the device- or in the case of an arming delay.<br>When set to "Yes", this parameter enables visual acknowledgement. The length of acknowledgement is defined by the "Arming acknowledgement time" parameter. |

□↵ Signalling system -> Interior security area / External skin security area -> <Detector>

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| Identifier | **Detector**, Text | A detector can be assigned a detector text here, which then clearly identifies the detector. This text (e.g. "Kitchen window", "Garage door"), and later during system operation, is either displayed in the detector list on the device screen or in the event memory if there is activity on the part of the detector, an alarm or a fault. Optionally, if there is an alarm, the detector text can be transmitted to the bus using separate 14 byte communication objects. |

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| Detector type | **Contact**<br>Movement<br>Glass break | The detector type of a detector (contact, movement, glass break) is specified here. The configured type only specifies the text display in the detector list and has no further effect on the behaviour of a detector. |
| Input active on | **1 telegram**<br>0 telegram | This parameter can configure each detector input to different telegram polarities, i.e. the detector can be active with a "1" telegram or a "0" telegram. The polarities configured in the signalling system must agree the edge parameters of the bus subscribers to which the detectors are connected. |

□↵ Fault messages -> Fault messages -> <Fault message>

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| Activation by object value | 0 telegram<br>**1 telegram** | This parameter defines upon which object value the fault message is activated. The inverted object value exits the fault message. |
| Text of fault message | No presetting, Text | A text can be entered here, which is displayed both in the message window and, if required, is logged in the message list. |
| Text, line 2 | No presetting, Text | The second line of the display text of the fault message in the message window can be specified here. |
| Text, line 3 | No presetting, Text | The third line of the display text of the fault message in the message window can be specified here. |
| Display external text on fault message | Checkbox: Yes / **No** | If this parameter is set ("Yes"), an additional 14-byte object becomes visible, which can receive a text message. This text is then also displayed in the message window. To receive this external text, the display of the message window is delayed internally. |
| Record sender address | Checkbox: Yes / **No** | The physical addresses of the devices, which have activated or deactivated a fault message, can be recorded in the message list. |

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| Open message window | Checkbox: **Yes** / No | It is possible to specify here whether a message window is also displayed when a fault occurs. If the message window is displayed, the signal can be acknowledged there. |
| Acoustic signal | Checkbox: Yes / **No** | This parameter determines whether the device plays back an audio file via the loudspeaker when there is an active fault message. It is useful to use this acoustic signalling function if fault messages should signal important events or states to the user of the device. In this case, it is advisable to use short and understandable signal tones. |
| Audio file | **default.wav**, Audio file in the file system of the commissioning PC | This parameter specifies which audio file should be played back as an acoustic signal when there is a fault message. The device can play back media files in "*.wav" format.<br>This parameter is only visible if the parameter "acoustic signal" is set. |
| Allow acknowledgement on touchscreen by user | Checkbox: **Yes** / No | A fault message can optionally be confirmed internally via the control surface "Acknowledge" in the message window (internal acknowledgement). This parameter defines whether an internal acknowledgement by the user directly on the device is possible. |
| Transmit value on acknowledgement | Checkbox: Yes / **No** | With internal acknowledgement, this parameter makes it possible to define whether or not an acknowledgement telegram is additionally transmitted to the bus.<br>Parameter not set ("No"): When the operating element is pressed, the acknowledgement is only processed internally. No information is sent to other devices.<br>Parameter set ("Yes"): An additional "acknowledgement object" is made visible. When the operating element is pressed, the acknowledgement is also sent to other devices via this 1-bit object. The telegram polarity of the acknowledgement object can be configured.<br>This parameter is only visible if an internal acknowledgement is allowed. |

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| Value | 0 telegram<br>**1 telegram** | This parameter is only visible if a telegram should be transmitted to the bus during an internal acknowledgement. It defines the telegram polarity of the acknowledgement telegram. |
| Allow external acknowledgment | Checkbox: Yes / **No** | An additional 1-bit communication object can be enabled for implementing external acknowledgement by this parameter. If the parameter is set, a fault message can also be acknowledged by other KNX devices via the acknowledgement receipt object. |
| Acknowledgment by | 0 telegram<br>**1 telegram** | This parameter is only visible if an external acknowledgement is allowed. It defines the telegram polarity of the external acknowledgement telegram. |
| Entry in message list | Checkbox: **Yes** / No | If this parameter is set ("Yes"), a fault message is logged in the message list. |
| Enter incoming | Checkbox: **Yes** / No | If this parameter is set ("Yes"), an incoming fault message (fault message activated) is logged in the message list together with the time.<br>This parameter is only visible on "Entry in message list = Yes". |
| Enter going | Checkbox: **Yes** / No | If this parameter is set ("Yes"), an outgoing fault message (fault message deactivated) is logged in the message list together with the time.<br>This parameter is only visible on "Entry in message list = Yes". |
| Enter acknowledged | Checkbox: **Yes** / No | If this parameter is set ("Yes"), the acknowledgement of a fault message is logged in the message list together with the time.<br>This parameter is only visible on "Entry in message list = Yes". |

☐↵ Scenes -> Global settings

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| Saving by extension | Disabled<br>**Enabled** | This parameter enables the save function of the light scene function. In the "Enabled" setting, new light scene values can be saved during operation of the device by receiving save telegrams via the extension object. In the |

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| | | "Disabled" setting, it is not possible to save new values using the extension object. |
| Delay between scene telegrams [ms] | 50...**100**...500 | The recalling of scenes can quickly cause a higher bus load especially if many functions were assigned to a scene. To avoid an excessive bus load, a time delay between scene telegrams can be configured here.<br>The transmission of telegrams in the course of the storage function always takes place immediately. |

□↵ Scenes -> Scene function -> <Scene function>

| | | |
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| Type | **DPT 1.001 (1-bit switching)**<br>DPT 5.001 … 5.004 (1-byte relative value)<br>DPT 9.001 … 9.021 (2-byte – value) | Scene functions can be configured alternatively to the data formats "Switching", "1-byte value" and "2-byte value" by this parameter. |
| Image text for 1 | **ON**, Text | Image text template of the switching state "1" (ON) for the status indication of the user settings directly on the device. |
| Image text for 0 | **OFF,** Text | Image text template of the switching state "0" (OFF) for the status indication of the user settings directly on the device. |
| Format | **#**<br>#,#<br>#,##<br>#,### | Setting of the visible decimal places for formatting the user settings directly on the device. |
| Display format | **Percent (%)**<br>Degrees (°)<br>User-defined | With the data point type "DPT 5.001...5.004" the display format for representing the user settings directly on the device can be defined by this parameter. |
| Unit | **%**, Unit selection | Setting of the unit of the editable value with the data point type "DPT 9.001...9.021" for formatting the user settings directly on the device. |

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| Offset | **0** | Setting of the value offset with the data point type "DPT 9.001...9.021" for formatting the user settings directly on the device. |
| Factor | **1** | Setting of the value gain with the data point type "DPT 9.001...9.021" for formatting the user settings directly on the device. |
| Minimum value | Value | Setting of the adjustable minimum value with the data point types "DPT 5.001...5.004" and "DPT 9.001...9.021" for restricting the user settings directly on the device. |
| Maximum value | Value | Setting of the adjustable maximum value with the data point types "DPT 5.001...5.004" and "DPT 9.001...9.021" for restricting the user settings directly on the device. |

☐↵ Scenes -> Scenes -> <Scene>

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| Value | **0 telegram**<br>1 telegram | The switching command of the scene can be predefined here. This parameter is only available for data point types "Switching". |
| Value | Value | The value of the scene can be predefined here. The settable value range depends on the formatting of the value of the scene output. This parameter is only available for data point types "Value". |
| Active | Checkbox: **Yes** / No | If the state of an actuator group is to remain unchanged during the recall of a scene, this parameter can be deselected (setting "No"). In this case, the device does not transmit a telegram via the scene output concerned during the recall of the scene. The scene output is deactivated for this scene. |

☐↵ Presence simulation

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| Identifier | **Function**, Text | Predefined designation that only appears in the configuration software, identifies an input more exactly and can be modified as required. |

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| Data point type | **DPT 1.001 (1-bit switching)**<br><br>DPT 5.001 … 5.004 (1 byte relative value) | The data type of a recording object of the presence simulation can be set here. |

# 5 Appendix

## 5.1 Index

**S**



**T**



**V**

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