Technical Manual

KNX Time Switch

SCN-RTC20.02

Further Documents:

Datasheet:

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

Assembly and Operation Instructions:

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

Solution Proposals for MDT products:

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

1 Content

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2 Overview

2.1 Overview Devices

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

- **SCN-RTC20.02** Time Switch 20-channel with colour display

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2.2 Functions

20 functions with up to 8 independent switching times can be realised with the MDT Time Switch SCN-RTC20.02. For daily repeated tasks, such as the UP and DOWN movement of the roller shutters/blinds in the morning or evening hours, or the ON and OFF switching of the outdoor lighting. This can be done not only according to the time, but also according to the calculated sunrise and sunset for the parametrised location, due to the integrated astro switching function. The new blind function now also controls the height and position of the slats as required. Used as master, the MDT Time Switch supplies the time and date to all bus devices. As slave it receives the time and date from a time server, for example, via an IP interface (SCN-IP000.03). In case of Internet failure, the MDT Time Switch can automatically switch to master mode. The large active colour display allows editing of the switching times and manual operation on the device.

Astro switch function
The astro switching function calculates the current sunrise and sunset by means of location, time and date. In addition to these, dawn and dusk can also be used as trigger for a function. These calculated values can be individually adjusted via ETS if required. The astro switching function can be linked to further conditions such as "time shift", "latest at" or "not earlier than"

Extra channel for Day/Night object
There is an extra channel for the day/night switching. The function is already defined here, only the polarity for "day" and "night" can be selected. This keeps the 20 time switch channels for further automation.

Holiday function with time period activation
The holiday function executes desired actions during longer absences, for example, the room temperature is lowered, lighting scenarios are started, or unneeded circuits are completely switched off. The holiday function is activated via a 1-bit object (On/Off) or via a 1-byte object. (fixed period, for example 7 days) The status object outputs the remaining days

Automatic public holiday calculation
The automatic public holiday calculation can be individually adjusted for all countries. For Germany and Austria, the public holidays of all federal states are preconfigured. Further individual dates can be added. The "public holiday" event can actively affect the time switch.

20 functions managed via ETS/device.
The MDT Time Switch has 20 freely configurable functions that can be managed and controlled via the ETS and/or directly on the device. Each function is assigned to a category ("light", "blind", "temperature", "other" or "central"). This results in a new clear operating concept of the time switch, consisting of the upper level with the category selection, the middle level with the selection of the function, and the lower level with the actual switching function. Each time switch function has its own locking object.

Output objects for azimuth and elevation angle
The objects for azimuth and elevation angle can be used, for example, in visualisations.

Catch up of switching times
The catching up of the switching times on restart, time change and unlocking can be set separately for each channel.

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Display lock with PIN code
The MDT Time Switch has a display lock with a 4-digit PIN code. This can be used to protect the time switch against unauthorised operation. The PIN code must be entered as soon as the time switch is in standby or the device lock has been activated via the display.

Active colour display
The timer has an active colour display. This can be set in brightness levels from 1 - 100 %.

Logic function
A total of 8 logic functions with up to 4 inputs each are available. Possible logics are AND, OR and XOR. If the conditions are met, 1-bit or 1-byte values can be sent at the output or scenes can be called up.

Updateable via DCA App
A firmware update (if available) is possible using the DCA app.
The DCA app for the time switch is available for free download in the KNX online shop and on the MDT homepage. DCA apps are supported as of ETS 5.

Long Frame Support
The MDT Time Switch supports "long frames" (longer telegrams). These contain more user data per telegram, which significantly reduces the programming time of the actuators with the ETS.

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2.3   Wiring diagram

The following figure shows an exemplary wiring diagram:

Figure 1: Wiring diagram

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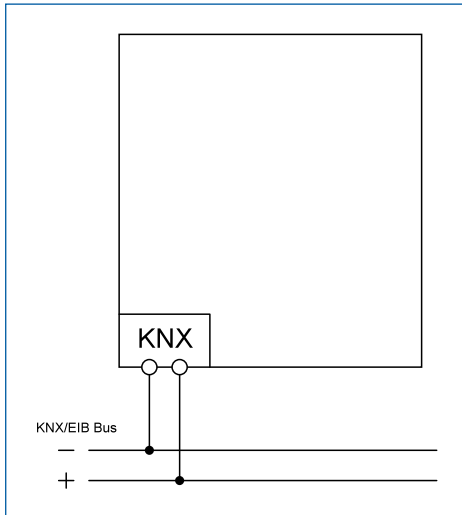
2.4 Structure & Handling

The following picture shows the structure of the device:

Figure 2: Structure & Handling

1	=	KNX Bus connection terminal	2	=	Programming button
3	=	Programming LED	4	=	Colour Display
5	=	Control buttons for navigating the display			

2.5 Commissioning

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

3   Communication objects

3.1   Standard settings of the communication objects

Standard settings – General								
No.	Name	Object Function	Length	C	R	W	T	U
147	In operation	Output	1 Bit	■	■		■	
148	Time	Receive current value	3 Byte	■		■	■	■
148	Time	Send current value	3 Byte	■	■		■	
148	Time	Receive (Send) current value	3 Byte	■	■	■	■	■
149	Date	Receive current value	3 Byte	■		■	■	■
149	Date	Send current value	3 Byte	■	■		■	
149	Date	Receive (Send) current value	3 Byte	■	■	■	■	■
150	Time / Date	Receive current value	8 Byte	■		■	■	■
150	Time / Date	Send current value	8 Byte	■	■		■	
150	Time / Date	Receive (Send) current values	8 Byte	■	■	■	■	■
151	Elevation angle	Send value	4 Byte	■	■		■	
152	Azimuth	Send value	4 Byte	■	■		■	
153	Sunrise	Send time	3 Byte	■	■		■	
154	Sunset	Send time	3 Byte	■	■		■	
155	Central lock of time switch	Lock	1 Bit	■		■		
156	Central lock of time switch	Status: Lock	1 Bit	■	■		■	
157	Holiday	Switch	1 Bit	■		■		
157	Holiday	Number of Days	1 Byte	■		■		
158	Holiday	Status	1 Bit	■	■		■	
158	Holiday	Status (Duration in Days)	1 Byte	■	■		■	
159	Public holiday	Activation (for external logic)	1 Bit	■		■		
160	Public holiday	Status	1 Bit	■	■		■	

Standard settings – General

No.	Name	Object Function	Length	C	R	W	T	U
161	VisuControl Easy II Interface	Input/Output	14 Byte	■		■	■	
202	Timing cycle	Every minute	1 Bit	■				
203	Timing cycle	Every hour	1 Bit	■			■	
204	Timing cycle	Every day	1 Bit	■			■	
205	Cycle 1	Send	1 Bit	■	■		■	
206	Cycle 2	Send	1 Bit	■	■		■	
207	Cycle 1	Start/Stop	1 Bit	■		■	■	
208	Cycle 2	Start/Stop	1 Bit	■		■	■	

Table 1: Communication objects – Standard setting: General

Standard setting – Functions

No.	Name	Object Function	Length	C	R	W	T	U
0	F1:	Blinds Up/Down	1 Bit	■			■	
0	F1:	Shutter Up/Down	1 Bit	■			■	
0	F1:	Dimming On/Off	1 Bit	■			■	
1	F1:	Switch	1 Bit	■			■	
1	F1:	Forcible control	2 Bit	■			■	
1	F1:	Percent value Decimal value Scene	1 Byte	■			■	
1	F1:	Absolute height position	1 Byte	■			■	
1	F1:	Dimming absolute	1 Byte	■			■	
1	F1:	Setpoint shift	1 Byte 2 Byte	■			■	
1	F1:	Mode selection (HVAC Mode)	1 Byte	■			■	
2	F1:	Status: Absolute height position	1 Byte	■		■	■	■
2	F1:	Status: Dimming value	1 Byte	■		■	■	■

		Standard setting – Functions							
No.	Name	Object Function	Length	C	R	W	T	U
2	F1:	Status for Display	1 Bit 2 Bit 1 Byte 2 Byte	■		■	■	■
3	F1:	Absolute position of slats	1 Byte	■			■	
4	F1:	Status: Absolute position of slats	1 Byte	■		■	■	■
5	F1:	Lock	1 Bit	■		■		
5	F1:	Release						
5	F1:	Input for threshold comparator	1 Byte 2 Byte 4 Byte	■		■		
6	F1:	Status: Lock	1 Bit	■	■		■	
+7	**next Function**							
141	Day / Night	Day = 1 / Night = 0 Day = 0 / Night = 1	1 Bit	■		■	■	■
145	Day / Night	Lock Release button(s)	1 Bit	■		■		
145	Day / Night	Comparative value: Lock	1 Byte 2 Byte 4 Byte	■		■		
146	Day / Night	Status: Lock	1 Bit	■	■		■	

Table 2: Communication objects – Standard setting: Functions

Standard setting – Logic functions								
No.	Name	Object Function	Length	C	R	W	T	U
162	Logic A	Input logic 1	1 Bit	■		■	■	■
163	Logic A	Input logic 2	1 Bit	■		■	■	■
164	Logic A	Input logic 3	1 Bit	■		■	■	■
165	Logic A	Input logic 4	1 Bit	■		■	■	■
166	Logic A	Output: Switch Output: Scene Output: Decimal value Output: Percent value	1 Bit 1 Byte 1 Byte 1 Byte	■	■		■	
+5	**next Logic**							

Table 3: Communication objects – Standard setting: Logic functions

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

4 ETS - Parameter

4.1 General Settings

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Send „In operation" cyclically	**not active** 1 min – 24 h	Activation of a cyclical "In operation" telegram.
Startup time	2 ... 240 s **[2 s]**	Sets the time between restart and functional start-up of the device.
Menu language	■ **German** ■ English ■ French ■ Spanish	Selection of the language on for the display.

Table 4: Settings – General

Send „In operation" cyclically
The "In operation" telegram is used to show on the bus that the device is "alive". If activated, an ON telegram is sent cyclically.

Start up time
This time defines when the device boots up after a restart (reset, reprogramming, bus voltage return). This can be important if, for example, a bus reset is carried out. If there are many devices on a line, all devices would start at the same time and place a load on the bus. With a variable time, the devices can start differently.
Important: + 10 sec. delay (to the device start-up time) for the timer (lock, switching times etc.).

Menu language
The language in which the text will be shown on the display is set here.
Note: The texts for the designation of the functions and the display settings etc. must be defined in the corresponding menus. If the ETS is used in German, the texts are in German by default.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
147	In Operation – Output	1 Bit	Sending a cyclical "In operation" telegram

Table 5: Communication objects – General settings

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4.2 Time and astro settings

4.2.1 Time setting

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Operating mode	■ Slave ■ Master ■ **Slave (Master in case of failure)**	Select which operating mode the Time Switch uses.
Send time cyclically every...	not active 1 min – 24 h **[1h]**	Specifies the transmission intervals at which the time is sent. **Only in "Master" operating mode.**
Request of Time/Date after reset	■ not active ■ **active**	Used to define whether the time and date should be requested after a reset **Only in "Slave" operating mode.**
Send time (on failure) cyclically every...	not active 1 min – 24 h **[1h]**	Specifies the transmission intervals at which the time is sent. **Only in "Slave (Master in case of failure)" operating mode.**
Automatic activation of summertime	■ not active ■ **active (Europe)** ■ active (individual)	Defines if the clock should change automatically between summer and winter time.
Shift	■ 1 h ■ 2 h	Adjustment of the difference between summer and winter time. **Only if "active (individual)" is selected.**

Table 6: Settings – Time settings

Operating mode
When used as a **"Master"**, the system time is actively sent from the device to the bus.
When selected as a **"Slave"**, the device receives the system time from another device on the bus, for example via an IP interface/router.
In the **"Slave (master in case of failure)"** setting, the device is set as a slave. If the system time is not received from the external timer within a certain time, the device becomes the "Master" and sends the current time cyclically to the bus.
Important: A time must be defined for the function. The time for cyclical sending of the "Slave" should be set the same as the time for cyclical sending of the "Master".

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Automatic changeover to summer time
With the **"active (Europe)"** setting, the changeover takes place automatically at the specified times in spring and autumn.
With the **"active (individual)"** setting, you can set the times yourself. When activated, the following table appears, which is then configured accordingly:

Summertime	Month	Rule	Weekday	Time
Start time	March ▼	last ▼	Sunday ▼	02:00 ▼
End time	October ▼	last ▼	Sunday ▼	03:00 ▼

Table 7: Settings – Changeover from summer and winter time (individual)

You can also set whether the time difference should be 1 hour or 2 hours.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
148	Time	3 Bytes	Send/receive time.
149	Date	3 Bytes	Send/receive the date.
150	Time / Date	8 Bytes	Send/receive time and date.

Table 8: Communication objects – Time and Date

4.2.2 Astro settings

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Location determination by	■ coordinates ■ **place**	Configuration of how the location is to be determined.
Location determination by place:		
Country	any country **Deutschland**	Selection of the country.
Town	any city **Engelskirchen**	Selection of the city.
Location determination by coordinates:		
Latitude	■ **North** ■ South	Specification of whether to count north or south latitude.
Latitude in degrees [0° - 90°]	0° … 90° **[50°]**	Setting the latitude.

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ETS Text	Dynamic range [Default value]	Comment
Latitude in minutes [0´ - 59´]	0´ … 59´ **[56´]**	Setting the minutes.
Longitude	■ **East** ■ West	Specification of whether eastern or western longitude is counted.
Longitude in degrees [0° - 180°]	0° … 180° **[6°]**	Setting the longitude.
Longitude in minutes [0´ - 59´]	0´ … 59´ **[57´]**	Setting the minutes.
Time difference from Universal Time (UTC + …)	Any time zone **[UTC+01:00 Amsterdam, Berlin]**	Setting the time zone for calculating the position of the sun.
Sunrise / Sunset	■ **standard** ■ individual settings	Setting how sunrise and sunset are to be determined.
Sunrise elevation angle	■ 12° 00´ (12°) ■ 11° 30´ (11,5°) ■ 11° 00´ (11°) ….. ■ -11° 00´ (-11°) ■ -11° 30´ (-11,5°) ■ -12° 00´ (-12°, natural twilight)	Adjusting the corresponding elevation angle **Only shown if "individual setting" is selected.**
Sunset elevation angle		
Dusk elevation angle		
Dawn elevation angle		
Data point type for objects "Elevation angle" and "Azimuth"	■ **Angle [°] (DPT14.007)** ■ Rotation Angle [°] (DPT8.011) ■ Angle [°] (DPT5.003)	The parameter is used to set the data point type with which the values for the elevation angle and azimuth are sent.

Table 9: Settings – Astro function

Sunrise/sunset (individual setting)
In certain cases it is necessary to adjust the sunrise/sunset, for example in a very mountainous region where the sun sets earlier behind the mountain or rises later. For this purpose, the sunrise/sunset and dawn/dusk can be specifically adjusted with the corresponding parameters.

Datapoint type for objects "Elevation angle" and "Azimuth"
Depending on requirements, the datapoint type for sending the values can be selected here. There are three types to choose from, either 1 byte, 2 bytes or 4 bytes in length.
Important: Azimuth and elevation angle are calculated every 5 minutes and sent cyclically to the bus.

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The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
151	Elevation angle - Send value	1 Byte 2 Byte 4 Byte	Send the value. DPT depends on the parameter setting.
152	Azimuth – Send value	1 Byte 2 Byte 4 Byte	Senden the value. DPT depends on the parameter setting.
153	Sunrise – Send time	3 Byte	Send the time.
154	Sunset – Send time	3 Byte	Send the time.

Table 10: Communication objects – Astro settings

4.2.3   Cycle programmes and timing cycle

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Cycle programmes and timing cycle	▪ **not active** ▪ active	Activates the cycle programs and the time cycle.
Times for cycle 1/2	▪ **not active** ▪ active	Activation of cycle 1 respectively Cycle 2. **Only visible if "Cycle programmes and timing" is active.**
Duration: ON	00:00:00 ... 23:59:59 hh:mm:ss **[00:00:00]**	Setting the time for how long an ON signal is to be sent.
Duration: OFF	00:00:00 ... 23:59:59 hh:mm:ss **[00:00:00]**	Setting the time for how long an OFF signal is to be sent.

Table 11: Settings – Time and astro settings: Cycle programmes and timing cycle

The time switch can output a time cycle and up to 2 cycle programs. The time clock sends a 1 command cyclically (every minute/hour/day) and can be used for synchronization or for executing periodic processes.

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The cycle function carries out a periodic sending of ON/OFF telegrams via the associated **"Start/Stop"** object from the start of the cycle:
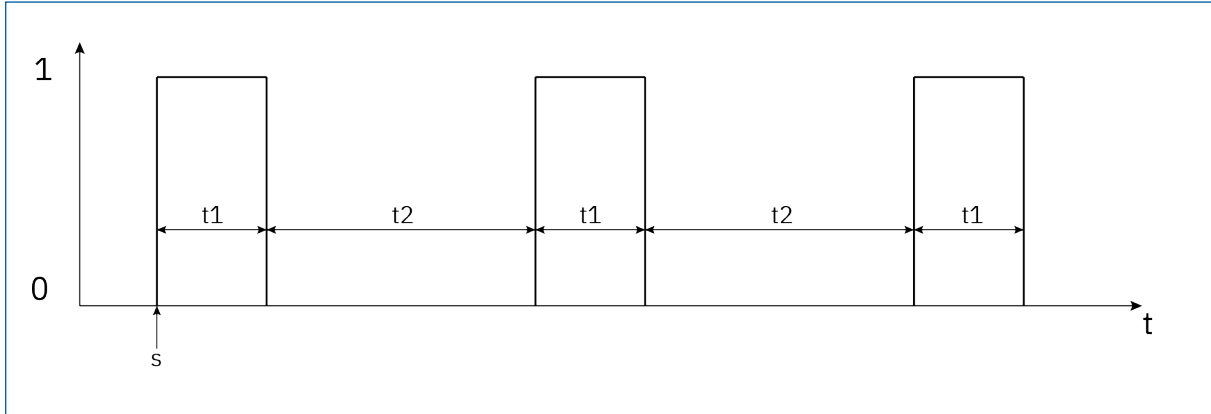
Figure 3: Diagram – Cycle function

s: Start Cycle-program
t1: Duration: ON
t2: Duration: OFF

The first ON pulse is sent for the set switch-on time immediately after the start command is sent. An OFF pulse is then sent for the set switch-off time and the cycle starts again up to when a stop command is sent. For example, the cycle programmes can be started cyclically via the system clock or at a specific time using the timer functions.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
202	Timing cycle – Every minute	1 Bit	Output of a 1 every minute, every full minute.
203	Timing cycle – Every hour	1 Bit	Output of a 1 every hour, on the full hour.
204	Timing cycle – Every day	1 Bit	Output of a 1 every day, always at 0:00 o'clock.
205	Cycle 1 – Send	1 Bit	Sends a 1 for the set duration after the start of this cycle and then a 0 for the set duration. The cycle runs periodically up to the end of the cycle with a Stop command.
206	Cycle 2 – Send	1 Bit	see cycle 1.
207	Cycle 1 – Start/Stop	1 Bit	Starts (= 1 signal) or stops (= 0 signal) the cyclical transmission of cycle 1.
208	Cycle 2 – Start/Stop	1 Bit	see cycle 1.

Table 12: Communication objects – Cycle programmes and timing cycle

4.3   Display settings

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Display brightness	1 / 2 / 3 / 4 / 5 / 10 / 20 / 30 / 40 / 50 / 60 / 70 / **80** / 90 / 100 %	Setting the basic brightness level.
Time until display OFF (0 = never)	0 ... 60 min **[10 min]**	Time setting until the display switches off.
Labelling		
Light	**[Licht]**	A free setting of up to 20 bytes is allowed in each case. Texts in brackets are set by default.
Blinds/Shutter	**[Jalousie]**	
Temperature	**[Temperatur]**	
Other	**[Sonstige]**	
Central	**[Zentral]**	

Table 13: Settings – Display settings

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4.4 Standby Display / Display lock with PIN-Code

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Standby display	■ not active ■ **Time with Sunrise/Sunset** ■ Time / Date ■ Display OFF	When activated, you can set what is shown on the display during "Standby".
Time until display switches to Standby	1 ... 60 s **[20]**	Time setting until the display switches to standby mode after the last operation of a button.
Display lock with PIN-Code	■ **not active** ■ active	Activation of a display lock by PIN code.
	Free setting of 0 ... 9 **[0 0 0 0]**	Setting a 4-digit PIN code. **Visible when "Display lock with PIN code" is active.**

Table 14: Settings – Standby display

The **"Display Lock with PIN Code"** parameter activates a 4-digit PIN code. The PIN code can be freely defined in the ETS and must be entered each time the display is in standby mode and a button on the device is pressed to exit standby mode.

Note: The display lock can also be activated via the display in the "Settings" - "Display lock" level menu at the device.

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4.5   Menu and time switch functions

4.5.1   Basic settings

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Switching times in the device	■ **are transmitted** ■ remain unchanged	Setting to specify if the parameter block for the switching times is transferred: **"are transmitted"**: The parameter block is transferred depending on the "Setting the Time Switch" parameter. **"remain unchanged"**: The parameter block for the switching times is not written by the ETS and the "Setting the Time Switch" parameter is hidden.
Setting the time switch	■ database (not changeable on device) ■ **manual input and database (database overwrites all switching times)** ■ manual input and database (transmission aborted if switching times are changed on the device	**Database:** The switching times can only be set in the database and cannot be changed via the device. **Manual input and database (database overwrites all switching times):** The switching times can be set in the database and via the device. The database is overwritten with all values from the database. **Manual input and database (transmission aborted if switching times are changed on the device):** Before transferring, the ETS makes a comparison between the switching times defined in the database and those in the device. If these are different, the download will be aborted.
Global settings		
Make up switching times on restart	■ **not active** ■ active	Setting whether the device retriggers (sends) all currently valid switching states after a restart.

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ETS Text	Dynamic range [Default value]	Comment
Make up switching times on time change	■ **not active** ■ active	Setting whether the device retriggers (sends) the skipped switching states after a clock adjustment forwards.
Make up switching times on unlocking	■ **not active** ■ active	Setting whether the device retriggers (sends) all ignored switching states after an unlocking process.
Holiday		
Activation via object "Holiday"	■ **not active** ■ 1 Bit - Switch ■ 1 Byte - Number of Days	Setting whether and how the holiday function can be activated via the bus. Activation via object 157.
Status output	■ **not active** ■ holiday active/not active ■ remaining holiday in days (1 Byte)	Setting the status output of the holiday to the bus.
Public holidays	■ **not active** ■ active	Activation of the public holiday function
Automatic calculation of public holidays	■ not active ■ **active**	Activation of the automatic public holiday calculation. When activated, a new sub-menu "Automatic calculation of public holiday" appears in the menu tree.
Manual control via object	■ **not active** ■ active, reset after the 1st change of day ■ active, reset after the 2nd change of day ■ active	Defines if and when the manual control via an object is active.
Switchover "Manual/ Automatic" on device	■ not active ■ **active**	Setting whether switching is possible using a button on the device.
Switchover "Lock" on device	■ not active ■ **active**	Setting whether lock/unlock is possible using a button on the device.

Table 15: Basic settings – Menu and time switch functions

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Make up switching times:
Making up for switching times allows you to set whether switching states that were omitted due to non scheduled events are made up for.

- **Make up switching times on restart**
  After a restart, the last switching states are restored, i.e. the time switch restores the state that should have been referred to at that time.

- **Make up switching times on time change**
  In the event of a time jump, which means a time adjustment of +..min/h, the switching operations that were omitted due to the time jump are carried out. With a time jump up to +90min, all switching events are made up. From a time jump of 90 min, only the last one per function is made up.

- **Make up switching times on unlocking**
  After unlocking, the switching states that were omitted during the locked state are made up. This ensures that all systems are in the correct state after unlocking.

Public holidays
The device has a comprehensive logic integrated to calculate public holidays. This public holiday calculation can be activated via the **"Automatic calculation of public holiday"** parameter.
A new menu then appears. For details see 4.5.2 Automatic calculation of public holidays

Additional public holidays can be activated manually via object 159 if the **"Manual control via object"** parameter is set to active. There is also an automatic reset function for this parameter. If the public holiday is deleted on the 1st day change, for example, the function can be used for the current day, because the public holiday then ends for the device at 00:00.
If, for example, the morning opening of the shutters is to be disabled on the next day, the reset may only take place on the 2nd day change, as in this case a "public holiday" object will be sent the evening before. In this case, the automatic reset takes place the following day at 00:00.
The interaction between "automatic calculation of public holiday" and manual activation via the "Holiday" object is described in the following table:

Public holiday calculated	Value of object 159	Action on object 159	Result: Public holiday active / not active
No	0	Sending: 0	No action
No	0	Sending: 1	Public holiday active up to the configured return, Automatic mode becomes active again from the next day.
No	1	Sending: 0	Manual deactivation, Automatic mode will be active again from the next day.
No	1	Sending: 1	Public holiday active up to the configured return, Automatic mode becomes active again from the next day
Yes	0	Sending: 0	Manual deactivation, Automatic mode becomes active again from the next day.
Yes	0	Sending: 1	Public holiday active up to configured return. Automatic mode becomes active again from the next day

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Public holiday calculated	Value of object 159	Action on object 159	Result: Public holiday active / not active
Yes	1	Sending: 0	Manual deactivation, Automatic mode becomes active again from the next day
Yes	1	Sending: 1	Public holiday active up to configured return. Automatic mode becomes active again from the next day.

Table 16: Public holiday calculation and manual activation

Switchover "Manual/Automatic" on device
This parameter can be used to switch between automatic and manual control in the corresponding function on the display.
Note: For details see 5   Operating via the buttons on the device.

Switchover "Lock" on device
it is possible to activate or deactivate a lock on the display in the corresponding function. If the lock is active, the function in the level above is also coloured red, indicating the active lock.
Note: For details see 5   Operating via the buttons on the device.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
157	Holiday – Switch	1 Bit	Activation of the holiday function via 1 Bit (active/not active).
157	Holiday – Number of days	1 Byte	Activate the holiday function by sending the number of days for which the time switch should be in holiday mode.
158	Holiday – Status	1 Bit	Indicates whether the holiday function is active or not active.
158	Holiday – Status (Duration in Days)	1 Byte	Indication of the remaining days, how long the holiday function is still active.
159	Public holiday – Activation (for external logic)	1 Bit	Activation of the public holiday function via bus, e.g. via Visu/Pushbutton.
160	Public Holiday – Status	1 Bit	Indicates whether the device is in holiday mode; sends the status when it changes and always at 00:00.
161	VisuControl Easy II Interface – Input/Output	14 Byte	Interface to VisuControl Easy II.

Table 17: Communication objects – Holiday / Public holiday

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4.5.2   Automatic calculation of public holidays

The following figure shows the menu for the automatic public holiday calculation:

Country	Germany ▼			
State	North Rhine-Westphalia ▼			

public holiday	Mode	Fixed public holidays	Day	Month	Offset
1	Holiday from list ▼	New Years day ▼			
2	Holiday from list ▼	Good Friday ▼			
3	Holiday from list ▼	Easter Monday ▼			
4	Holiday from list ▼	Labor Day / May 1st ▼			
5	Holiday from list ▼	Ascension Day / Ascension of Christ ▼			
6	Holiday from list ▼	Whit Monday ▼			
7	Holiday from list ▼	Corpus Christi ▼			
8	Holiday from list ▼	Anniversary of German unification ▼			
9	Holiday from list ▼	All Saints' Day ▼			
10	Holiday from list ▼	1st Christmas Day ▼			
11	Holiday from list ▼	2nd Christmas Day ▼			
12	Holiday from list ▼	not active ▼			
13	Holiday from list ▼	not active ▼			
...					
20	Holiday from list ▼	not active ▼			

Figure 4: Automatic calculation of public holidays

Public holidays are already predefined for all federal states in Germany and Austria and are calculated each year using integrated logic. Numerous public holidays are also predefined for other EU countries. In addition, further public holidays can be integrated using the following rules:
The **"fixed date"** rule defines public holidays that take place on the same day every year. Common examples of this are New Year's Day on 1 January or Labour Day on 1 May.
As many public holidays in Christian countries are based on Easter, public holidays can be defined **"relative to Easter Sunday"**. An offset of -100 up to +100 days from Easter Sunday must be defined. As the simplest example, Easter Monday is always exactly one day after Easter Sunday.
In addition, rules can also be created **"individual"** with which own public holidays can be calculated. If this rule is selected, a date can be selected and the public holiday can be calculated based on this date. The calculated public holiday can be a maximum of 1 week before this date and 1 week after this date.

4.5.3   Selection of functions

A list of functions appears, which can be activated individually. When a function is active, a separate sub menu appears for it.

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4.5.3.1 Identical parameter

Some parameters are identical for all functions. These are described below.
Two labelling fields are available:

Function/Object description	Example function
Description of function in the display	Light example
Function level / Category	Light ▼

Figure 5: Identical parameter – Labelling fields

The **"Function/object description"** parameter is used to improve clarity in the ETS and has no effect on the display on the device. A text with up to 30 characters is permitted.
The text entered for the function/object description appears both in the menu behind the corresponding function and in the function's communication objects.

Selection of functions		Communication object		
– F1: Example function	…	■⇆|1	F1: Example function	Switch
		■⇆|2	F1: Example function	Status for Display

Figure 6: Identical parameter – Text for object description

Important: With the "Day/Night" function, the text of the object description is fixed to "Day/Night".

The configured text for **"Description of function in the Display"** appears on the display of the device when the function is selected. A text with up to 20 characters is allowed here.
The parameter **"Settings changeable on the device"** can be used to define whether this function should be displayed on the device or not. If the parameter is set to "not active", the function is not active on the device, but the Time Switch can still be executed.

Settings changeable on the device	○ not active ◉ active

Figure 7: Identical parameter – Settings changeable on the device

The functions are grouped by the following parameter:

Function level / Category	Light ▼

Figure 8: Identical parameter – Function level / Category

Each function of the timer can be sorted into a "Function level / Category". This function is then displayed in this level on the device. The following categories are possible:

- Light
- Blinds/Shutter
- Temperature
- Other
- Central

A function level is displayed on the device when at least one function for this level is active.

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4.5.3.2 Function – Switch

If the "Settings changeable on the device" parameter is activated, the following settings are available:

ETS Text	Dynamic range [Default value]	Comment
Presentation	■ **Switch ON/OFF** ■ Light ON/OFF	Setting how the function is to be shown on the display.
Text for "OFF"	Free definable text [up to 6 characters allowed]	Setting the labelling in the display.
Text for "ON"	Free definable text [up to 6 characters allowed]	Setting the labelling in the display.

Table 18: Settings – Function: Switch

The **"Presentation"** refers to the indication on the display as to whether the function is shown with "I/O" or the lamp symbol.
The parameters "Settings changeable on device" and "Function level / category" are described in more detail on 4.5.3.1   Identical parameter.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
1	F1: – Switch	1 Bit	Switch function of the buttons.
2	F1: – Status for Display	1 Bit	Status to update the display on the device. Must be linked to the status of the actuator to be switched.

Table 19: Communication objects – Function: Switch

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4.5.3.3 Function – Send values

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Datapoint type	■ 2 Bit DPT 2.001 Switch control ■ **1Byte DPT 5.001 Percent (0...100%)** ■ 1 Byte DPT 5.005 Decimal factor (0...255) ■ 1 Byte DPT 17.001 Scene number ■ 2 Byte DPT 7.600 Colour temperature (Kelvin) ■ 2 Byte DPT 9.001 Temperature (°C) ■ 2 Byte DPT 9.004 Brightness (Lux)	Setting the data point type to be sent.
Unit	Unit according to set datapoint type (no unit, K, °C, Lux)	Only for 2 Byte datapoint types: colour temperature, temperature and brightness.
The following parameters are displayed if **"Settings changeable on the device"** => active		
Limit value range	■ **not active** ■ active	When activated, the value range to be sent can be limited.
Lower limit Upper limit	Any value according to set datapoint type	Setting the value range. **Only visible if "Limit value range" is active.**
Presentation	■ Switch ON/OFF ■ Light ON/OFF ■ dimming value ■ universal value	Setting how the function is shown in the display. **"Switch function/light on/off"** only for DPT2.001, **"Dimming value"** only for DPT5.001. Otherwise **"Universal value"** cannot be changed.

Table 20: Settings – Function: Send values

The **"Limit value range"** parameter can be used to set whether a minimum or maximum limit for the values is active. The values are defined in the **"Lower limit"** and **"Upper limit"** parameters. This means that the values on the device can only be changed within these limits.
Important: The limitation only refers to the setting on the device itself. If, for example, values outside the limit have been set in the ETS in the "Timer" menu, these are valid. If these values are now changed on the device, the values automatically jump back to the maximum or minimum values when entered manually and can only be changed within the limits.

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If the **"Universal value"** parameter is selected for **"Display"**, the following symbol appears on the display (cannot be changed):

The parameters "Settings changeable on device" and "Function level / category" are described in more detail on 4.5.3.1   Identical parameter.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
1	F1: – Forcible Control, Percent value, Decimal value…	1bit, 1 byte 2 byte	Sends the value. DPT depending on the parameter setting.
2	F1: – Status for display		Receiving the status. DPT depends on the parameter setting. **Status for "Scene" not possible.**

Table 21: Communication objects – Function: Send values

4.5.3.4   Function – Temperature shift

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Temperature shift	■ 1 Byte Temperature shift ■ **2 Byte Temperature shift** ■ 2 Byte shift of "Basic Comfort setpoint"	Sets the value by which the temperature is to be shifted.
Step width	0,1 K – 1,0 K [0,5 K]	Setting the increment . **Only for "1 byte Temperature shift."**
The following parameters are displayed if **"Settings changeable on the device"** => active		
Limit value range	■ not active ■ **active**	When activated, the value range to be sent can be limited.
Lower limit	Any value according to unit set (°C, K) -273 … 670760	Setting the value range. **Only visible if "Limit value range" is active.**
Upper limit		

Table 22: Settings – Function: Temperature shift

The **"Limit value range"** parameter can be used to set if a minimum and maximum limit for the values is active. The values are defined in the **"Lower limit"** and **"Upper limit"** parameters. This means that the values on the device can only be changed within these limits.
Important: The limit only refers to the setting on the device itself. If, for example, values outside the limit have been set in the ETS in the "Time switch" menu, these are valid. If these values are now changed on the device, the values automatically fall back to the maximum or minimum values when entered manually and can only be changed within the limits.

"Settings changeable on device" is described in more detail, see 4.5.3.1   Identical parameter.
The "Function level / category" parameter is omitted and is set internally to "Temperature".

The temperature shift can be realised in 3 different ways:

1 Byte temperature shift
With this type of shift, the timer sends a temperature shift in "K" (Kelvin) to a temperature controller at the specified times (in the **"Time Switch"** menu), which is also set to the shift via 1 Byte. The step width should be set to the same value in the controller and in the timer. The current setpoint sent by the controller can be shown in the display via status object.

2 Byte temperature shift
With this type of shift, the timer sends a temperature shift in "K" (Kelvin) to a temperature controller at the specified times (in the **"Time Switch"** menu), which is also set to the shift via 2 Bytes. The current setpoint value sent by the controller can be shown on the display via status object.

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2 Byte shift of "Basic Comfort setpoint"

With this type of shift, the timer sends a new, absolute basic comfort setpoint in "°C" to the controller to be addressed. The controller must also be set to 2 byte shift of the basic comfort setpoint. The current setpoint value sent by the controller can be shown in the display via status object.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
1	F1: – Setpoint shift	1 Byte 2 Byte	Sends the setpoint shift. DPT depending on the parameter setting.
2	F1: – Status for display	2 Byte	Receiving the actual setpoint of the controller.

Table 23: Communication objects – Temperature shift

4.5.3.5 Function – Mode selection

The "mode selection" function can be used to switch the operating mode in heating actuators or temperature controllers.

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
The following parameters are displayed if **"Settings changeable on the device"** => active		
Limit value range	▪ not active ▪ **active**	When activated, the value range to be sent can be limited.
Operating modes	▪ **Comfort, Standby, Eco (Night), Frost** ▪ Comfort, Standby, Eco (Night) ▪ Comfort, Standby	Setting the value range. **Only visible if "Limit value range" is active.**

Table 24: Settings – Function: Mode selection

The **"Limit value range"** parameter is used to set if a limitation of the setting range is active. The values are defined in the **"Operating modes"** parameter. This means only the selected operating modes can be set on the device. The "Eco" operating mode is equivalent to the "Night" operating mode.

Important: The limitation only refers to the setting on the device itself. If, for example, operating modes outside the limit have been set in the "Time Switch" menu in the ETS, these are valid. If the operating modes are now changed on the device, the values automatically jump to the possible values when entered manually and only operating modes within the limited range can be selected.

The parameters "Settings changeable on device" is described in more detail on 4.5.3.1 Identical parameter.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
1	F1: – Mode selection (HVAC Mode)	1 Byte	Sending the operating mode.
2	F1: – Status for display	1 Byte	Receiving the status from controller.

Table 25: Communication objects – Function: Mode selection

4.5.3.6 Function – Blinds

The "blinds" function is used to control blind actuators.

If the "Settings changeable on the device" parameter is active, the function can be shown on the display in a "Function level / category" and actions can be changed manually there

The parameters "Settings changeable on device" and "Function level / category" are described in more detail on 4.5.3.1 Identical parameter.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
0	F1: – Blinds Up/Down	1 Bit	Up/Down command for the blind actuator.
1	F1: – Absolute height position	1 Byte	Sending an absolute height position.
2	F1: – Status: Absolute height position	1 Byte	Receiving the status of absolute blind position.
3	F1: – Absolute position of slats	1 Byte	Sending an absolute slat position.
4	F1: – Status: Absolute position of slats	1 Byte	Receiving the status of absolute slats position.

Table 26: Communication objects – Function: Blinds

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4.5.3.7 Function – Shutter

The "shutter" function is used to control shutter actuators.

If the "Settings changeable on the device" parameter is active, the function can be shown on the display in a "Function level/category" and actions can be changed manually there

The parameters "Settings changeable on device" and "Function level / category" are described in more detail on 4.5.3.1   Identical parameter.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
0	F1: – Shutter Up/Down	1 Bit	Up/Down command for the shutter actuator.
1	F1: – Absolute height position	1 Byte	Sending an absolute blind height position.
2	F1: – Status: Absolute height position	1 Byte	Receiving the status of absolute shutter position.

Table 27: Communication objects – Function: Shutter

4.5.3.8 Function – Dimming

The "dimming" function is used to control dimming actuators.

If the "Settings changeable on the device" parameter is active, the function can be shown on the display in a "Function level/category" and actions can be changed manually there

The parameters "Settings changeable on device" and "Function level / category" are described in more detail on 4.5.3.1   Identical parameter.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
0	F1: – Dimming On/Off	1 Bit	Switching command for dimming function.
1	F1: – Dimming absolute	1 Byte	Sending an absolute dimming value.
2	F1: – Status: Dimming value	1 Byte	Receiving the status of the current dimming value.

Table 28: Communication objects – Function: Dimming

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4.5.3.9 Function – Day/Night

In addition to the 20 functions, the "Day/Night" function is also available in selection of functions. This is only used for Day/Night switchover.

The **"Value for Day/Night"** parameter can be used to specify the polarity. This results in which value ("Day" or "Night") is sent with a logical "1" or a logical "0".

If the "Settings changeable on the device" parameter is active, the function can be shown on the display in a "Function level/category" and actions can be changed manually there

The parameters "Settings changeable on device" and "Function level / category" are described in more detail on 4.5.3.1   Identical parameter.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
141	Day/Night – Day = 1 / Night = 0 Day = 0 / Night = 1	1 Bit	Day/Night switchover command

Table 29: Communication object – Day/Night Function

4.5.4   Time switch

A switching time menu appears for each activated function. Up to 8 switching times and other settings can be individually configured there.

A central lock for the Time Switch is superordinate to all switching times for the 20 functions and the day/ night function. The behaviour of this central lock can be defined separately for each of the functions.

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
155	Central lock of time switch – Lock	1 Bit	Activating/deactivating the central lock for the time switch
156	Central lock of time switch – Status: Lock	1 Bit	Sending/reading of the status of whether the central lock for the time switch is set

Table 30: Communication objects – Central lock of time switch

4.5.4.1   Switching times

8 switching times can be set for each function using a table format
(here using the example: Function - switch):

#	Mo	Tue	We	Thu	Fri	Sat	Sun	Mode	Condition	h	min	Value	Value changea...
1	☑	☑	☑	☑	☑	☐	☐	Sunrise ▼	latest at ... ▼	12 ▼	20 ▼	◉ OFF ○ ON	☑
2	☐	☐	☐	☐	☐	☑	☑	Sunrise ▼	time shift ▼		0 ▼	◉ OFF ○ ON	☑
3	☑	☑	☑	☑	☑	☐	☐	Sunset ▼	earliest at ... ▼	12 ▼	24 ▼	◉ OFF ○ ON	☑
4	☐	☐	☐	☐	☐	☑	☑	Sunset ▼	time shift ▼		0 ▼	◉ OFF ○ ON	☑
5	☑	☐	☐	☐	☐	☐	☐	Time ▼		0 ▼	0 ▼	◉ OFF ○ ON	☑
6	☐	☑	☐	☐	☐	☐	☐	Dawn ▼	time shift ▼		0 ▼	◉ OFF ○ ON	☑
7	☐	☐	☐	☐	☐	☑	☐	Dusk ▼	time shift ▼		0 ▼	◉ OFF ○ ON	☑
8	☐	☐	☐	☐	☐	☐	☑	Random ▼	+/- 10min ▼	0 ▼	0 ▼	◉ OFF ○ ON	☑

Figure 9: Settings – Switching times 1-8

For each of the 8 switching times, you can set the days of the week on which they should be active.

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The following modes are available:

Time:
The action for this switching time is executed at a fixed time.

Sunrise/sunset/dawn/dusk:
The action for this switching time is executed for the corresponding mode. Conditions can also be defined in this mode. For example, the time can be shifted forwards/backwards by a fixed time using the **"Time shift"** function.
The **"latest at"** or **"earliest at"** condition can be used to restrict the action of the switching time.

Random:
The action for this switching time is executed in a time period at a specified time. The coincidence is specified as a condition (e.g. +/- 60 min) at this time.

The **"Value"** parameter specifies the value to be sent for this switching time. The **"Value changeable"** parameter can be used to lock single switching times so that they cannot be changed by the user.

Important: If "Settings changeable on the device" is activated in the function, it is still possible to individually determine which switching times may be excluded from the changes in the table. For example, an important switching time that has an effect on other functions can be deactivated and therefore cannot be changed on the device.

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4.5.4.2 Lock object type

The priority of the locks is set as follows:

- Priority 1: Manual operation
- Priority 2: Lock
- Priority 3: Lock via holiday function
- Priority 4: Behaviour like Sunday (due to holiday or public holiday)

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Lock object type	■ not active ■ **lock object** ■ release object ■ threshold comparator	Setting what the object is used for.
Datapoint type: threshold	■ **DPT 5.001 Percent 0...100%** ■ DPT 5.005 Value 0...255 ■ DPT 7.012 Current [mA] ■ DPT 7.013 Brightness [Lux] ■ DPT 9.001 Temperature [°C] ■ DPT 9.004 Brightness [Lux] ■ DPT 9.005 Wind speed [m/s] ■ DPT 9.007 Humidity [%] ■ DPT 9.008 Air quality [ppm] ■ DPT 9.021 Current [mA] ■ DPT 12.1201 Volume [m³] ■ DPT 14.019 Current [A]	Selection of the data point type according to which the threshold value is determined. **Only with "threshold comparator" setting.**
Lock active when	■ **input value greater than comparative value** ■ input value smaller than comparative value ■ input value equals comparative value ■ input value not equal to comparative value	Specifies the condition at which the lock becomes active. **Only with "threshold comparator" setting.**
Comparative value	Can be set according to "Datapoint type: threshold"	Setting the value from which the lock becomes active. **Only with "threshold comparator" setting.**

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ETS Text	Dynamic range [Default value]	Comment
Hysteresis	not active, 1%, 2%, 5%, 10%, 20%, 30%, 40%, 50% **[1%]** not active, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20 **[1]**	Setting the hysteresis for the removal of the lock. Scaling according to DPT. **Only with "threshold comparator" setting and there only with "greater than" or "smaller than" comparator value.**
Behaviour on lock	■ **lock** ■ lock and send fixed value ■ lock and send fixed value cyclically	Setting the behaviour to be executed during a lock.
Value on lock	The value range depends on the selected function	The set value is sent when a lock is activated. **Only visible if "Behaviour on lock" is set to "lock and send fixed value…".**
Central lock Time Switch	■ not active ■ **active**	Setting whether the central lock is active for this function.

Table 31: Settings – Time Switch: Lock object type

Lock object type
A lock can be triggered or released in three different ways:

- **Lock object**: Lock with 1, release with 0
- **Release object** : Release with 1, lock with 0
- **Threshold value comparator** : By specifying a **"Lock active if"** condition and a comparison value - corresponding to the "Datapoint type" - a threshold is defined from which object value the lock is triggered and released according to the set hysteresis

Important: The hysteresis only has an effect on the withdrawal of the lock.

Example:
Lock active when: input value greater than comparative value
Brightness [Lux]:   10000 Lux
Hysteresis: 2%

Object value => 10001 Lux => Lock active. Only with an input value of 10000 Lux - 2% (=9800 Lux) the lock is released.

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Behaviour in case of lock:
Defines the behaviour of the lock function.

- **Lock**
  The Time Switch is locked and remains locked as long as "Holiday" is active.
- **Lock and send fixed value**
  The timer is locked and a fixed value is sent once when the lock gets activated.
- **Lock and send fixed value cyclically**
  The Time Switch is locked and a fixed value is sent cyclically. The cycle time is set via a common parameter for "Lock" and "Holiday". For details see 4.5.4.4 Send values cyclically .

Value on lock:
The value to be sent depends on the selected function. For example, only ON or OFF can be sent for "Switch". For "Dimming", ON/OFF and a fixed dimming value of 0% - 100% can be sent.

The "Blinds" function has a special feature. An additional parameter "Selection" is available here. The height position and the slat position can be defined here using the ▤ and ⟋ icons.

Selection	▤ ⟋ ▼
Height: Value on lock	3% ▼
Slats: Value on lock	70% ▼

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
5	F1: – Lock	1 Bit	Lock/unlock the Time Switch. **For lock object type „lock object".**
5	F1: – Release	1 Bit	Lock/unlock the Time Switch. **For lock object type „release object".**
5	F1: – Input for threshold comparator	1 Byte 2 Byte 4 Byte	Receiving an external value to lock/unlock the time switch. **For lock object type „threshold comparator".**
6	F1: – Status: Lock	1 Bit	Sends the actual status.
145	Day/Night – Lock	1 Bit	Receiving an external value for locking by Day/Night function **The labelling differs depending on the function set.**
146	Day/Night – Status: Lock	1 Bit	Sends the actual status.

Table 32: Communication objects – Time Switch: Lock/Release

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4.5.4.3 Holiday

A behaviour can be defined for each function during an active holiday function.

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Holiday	■ **not active** ■ active	Activating/deactivating the holiday function.
Behaviour when "Holiday" active	■ **lock time switch** ■ execute time switch ■ behaviour like Sunday	Setting the behaviour while "Holiday" is active.
Behaviour when "Holiday" not active	lock time switch execute time switch	These settings are not selectable but result from the setting "Behaviour when holiday active".
Behaviour on lock by "Holiday"	■ lock ■ **lock and send fixed value** ■ lock and send fixed value cyclically	Setting the behaviour when a lock is set by "Holiday".
Value on lock by "Holiday"	The value range depends on the selected function	This value is sent when locked by "Holiday". **Only visible if "Behaviour when on lock by "holiday" is set to "Lock and send fixed value…".**

Table 33: Settings – Time Switch: Holiday

Operation via display see 5   Operating via the buttons on the device

Behaviour when holiday active
The following scenarios can be realised by activating the holiday function:

■ **Lock time switch**
   The holiday function acts like a lock function and locks this Time Switch. If "Holiday" is not active, the timer is executed normally.

■ **Execute timer**
   The timer is only executed when "Holiday" is active and is locked when "Holiday" is not active.

■ **Behaviour like Sunday**
   The Time Switch only executes the switching times that are activated exclusively for "Sunday".

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Behaviour on lock due to holiday
Defines the behaviour that is executed when the timer is locked by "Holiday".

- **Lock**
  The Time Switch is locked as long as **"Holiday"** is active.

- **Lock and send fixed value**
  The Time Switch is locked and a fixed value is sent once when the lock is activated.

- **Lock and send fixed value cyclically**
  The Time Switch is locked and a fixed value is sent cyclically. The sending intervals are set via a common parameter for "Lock/enable" and "Holiday". For details see 4.5.4.4   Send values cyclically.

Examples of the holiday function:

During the holiday, the heating should be lowered to the "Standby" operating mode and set to "Comfort" again after the holiday:
A difference must be made here as to whether the heating is running a night setback in normal operation or not, i.e. is a timer for the operating mode switchover active or not?
If this is active, it can also be used and the behaviour in the event of a lock due to holidays should be set to "lock and send fixed value cyclically". This will ensure that the timer switches the heating controller/ heating actuator cyclically to the desired operating mode (e.g. standby).
The parameter Reset behaviour on unlocking/holiday should be set to "Catch up switching times". This will always establish the currently valid behaviour. If the holiday ends at 0:00, for example, the "Night" operating mode is sent. If the holiday is ended prematurely at any time during the day, the "Comfort" operating mode is sent.
If no night switch-off is set, a separate function must be created for the holiday function. No switching times need to be stored for this. The behaviour on lock due to holiday should be set to "lock and send fixed value" and switch to the "Standby" operating mode. The behaviour on unlocking/holiday reset parameter should be set to "send fixed value" and switch back to the "Comfort" operating mode, for example. It should be noted that in the case of underfloor heating, the holiday should end one day before the actual end of the holiday due to the longer heating phase. This function can also be used with the "Temperature shift" function.

During the holiday, a "presence simulation" should run for certain lights:
If you want some lights to switch on/off randomly during a holiday, the "Behaviour on holiday active" parameter is set to "Execute timer". This means that the timer is only executed if a holiday has been set and is locked if no holiday has been set. The switching times can be set to "Random" mode.

During the holiday, the blinds/roller shutters should be opened as on Sunday:
If the blinds/shutters are to open later during the holiday, i.e. perform the behaviour "like Sunday", the parameter "Behaviour on holiday active" must be set to "Behaviour like Sunday". This means that while "Holiday" is active, only the timers that are defined exclusively for Sunday are executed.

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4.5.4.4 Send values cyclically

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Send values cyclically	■ **not active** ■ active	Activation of a "cyclic sending" function.
Send cyclically every...	1 min – 24 h **[10 min]**	The text displayed as ETS Text depends on the configuration.
Send value during "Holiday" cyclically every ...		
Send value during "Lock" cyclically every ...		
Send value during "Lock" + "Holiday" cyclically every ...		
Behaviour on unlocking / reset "Holiday"	■ **execute basic settings** ■ make up switching times ■ send fixed value ■ no action	Setting for the action "End of lock"/"End of holiday".
Value on unlock	0 – 100 % **[0%]**	Value to be sent when locks / holidays are removed. **Only displayed if "Send fixed value" is selected.**

Table 34: Settings – Time Switch: Send values cyclically

Important: In this parameter, the time for cyclical sending is centralised for all sending values.

If the parameter **"Send cyclically values"** is **active**, only "Send cyclically every …" appears. The set time then refers to any value that is currently sending cyclically. This can be the value after the Time Switch, the value when the lock is active (if "Behaviour on lock" is set to "Lock and send fixed value cyclically") or the value for holidays (if "Behaviour on lock by holiday" is set to "Lock and send fixed value cyclically"). If, for example, all settings are active, the order of priority refers, see 4.5.4.2 Lock object type.

If the parameter **"Send values cyclically" is not active**, the text appears depending on the settings for lock and holiday respectively. If, for example, only one lock object type is active and the behaviour for lock is set to "Send lock and fixed value cyclically", the text "Send value cyclically every …" during lock appears. If only holiday is active and "Lock and send fixed value cyclically" is selected, the text "Send value cyclically during holiday every …" appears. If lock and holiday are active and both are set to "Send lock and fixed value cyclically", the text "Send value during lock + holiday cyclically every …" appears.

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Behaviour when unlocking/resetting holiday

Defines the behaviour for resetting of the lock function and the end of the holiday function.

- **execute basic setting**
  The setting is carried out as in the "Basic settings" menu, see 4.5.1 Basic settings, for the "Make up switching times on unlocking" parameter.

- **make up switching times**
  After unlocking, the switching states that were omitted during unlocking are made up for. This ensures that all trades are in the correct state after unlocking.

- **send fixed value**
  After unlocking/end of holiday, the set value is sent under "Value for unlocking".

- **no action**
  After unlocking/end of holiday, no action is performed and the time switch remains in its current state.

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4.5.4.5 Other behaviour

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Behaviour after bus power return	▪ **lock and manual operation not active** ▪ lock active and manual operation not active ▪ restore lock and manual operation not active ▪ restore lock and manual operation	Setting how a lock and manual operation on the device behave after bus power return.
Behaviour on public holiday	▪ public holiday like sunday ▪ **no action**	Setting of behaviour on a public holiday.
Make up switching times on restart	▪ not active ▪ active ▪ **global settings**	Setting how switching times behave when the device is restarted.

Table 35: Settings – Time switch:Other behaviour

The **"Behaviour after bus power return"** defines how the device should behave. Lock and manual mode can assume fixed states or restore the behaviour before a bus voltage failure.

The **"Behaviour on public holiday"** parameter is used to define the corresponding behaviour. With the setting "Public holiday like Sunday", the time switch only executes the switching times that are only activated for Sunday. With "No action", the time switch is locked when the public holiday is active.

With the **"Make up switching times on restart"** parameter, it is possible to set individually for each single function whether the switching times are to be made up or not when the device is restarted. Alternatively, the settings in the "Basic settings" – "Global settings" menu can be adopted.

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4.6 Logic

The following table shows the available settings:

ETS Text	Dynamic range [Default value]	Comment
Request logic objects after reset	■ not active ■ **active**	Setting if the logic objects should be requested automatically after restarting the device.
Setting logic A - H	■ **not active** ■ OR ■ AND ■ XOR	Setting of the logical operation.
Object type for logic output	■ **Switch** ■ Scene ■ Decimal value ■ Percent value	Setting the object type for the output object.
Sending condition	■ not automatic ■ change of input ■ **change of output** ■ change of output, only with value 1 ■ change of output, only with value 0 ■ on input telegram (from HW R3.0)	Setting when the value of the output is sent. **Only for output type „Switch".**
Output inverted	■ **no** ■ yes	Reverses the output when activated (0 → 1, 1 → 0). **Only for output type „Switch".**
Scene number	1 – 64 **[2]**	Setting which scene number is sent when the logic function is fulfilled. **Only for output type „Scene".**
Value	0 – 255 **[0]**	Setting which value is sent when the logic function is fulfilled. **Only for output type „Decimal value"**
Value	0% – 100% **[0%]**	Setting which value is sent when the logic function is fulfilled. **Only for output type "Percent value".**
input logic 1 – 4	■ not active ■ **normal active** ■ inverted active ■ active normal, with preset "1" (from HW R3.0) ■ active inverted, with preset "1" (from HW R3.0)	Setting how an input will be included in the processing.

Table 36: Settings – Logic

There are 8 logic blocks available, each of which can be assigned 4 input objects.
The **"Request logic objects after reset"** parameter refers to all 8 logic blocks and defines whether a read request for the input logic is sent when the device is restarted.

The **"Object type for logic output"** determines which value is sent as the logic output.

The **"sending conditions"** (only for object type logic output "Switch") behave as follows:

- **not automatic:** No sending, only request.
- **change of input:** Send whenever a change is received.
- **change of output:** Send only when the output changes.
- **change of output, only with value 1:** Send only when changing the output with additional filter function of the value to be sent.
- **change of output, only with value 0:** Send only when changing the output with additional filter function of the value to be sent..
- **on input telegram (from HW R3.0):** Send whenever a telegram is received at one of the inputs.

The settings for the **"input logic"** are as follows:

- **not active:** Object for this input logic deactivated.
- **normal active:** Object is processed normally.
- **inverted active:** Object is first reversed (1 → 0, 0 → 1) and then processed.
- **active normal, with preset „1" (from HW R3.0):** Object is processed normally. As long as no defined status is present at the input, this is preset with a "1".
- **active inverted, with preset „1" (from HW R3.0):** Object is first reversed (1 → 0, 0 → 1) and then processed. As long as no defined status is present at the input, this is pre-assigned with a "1".

The following table shows the associated communication objects:

Number	Name / Object function	Length	Usage
162	Logic A – Input logic 1	1 Bit	Input object 1 of the logic
163	Logic A – Input logic 2	1 Bit	Input object 2 of the logic
164	Logic A – Input logic 3	1 Bit	Input object 3 of the logic
165	Logic A – Input logic 4	1 Bit	Input object 4 of the logic
166	Logic A – Output: Switch / Scene / Value / Percent value	1 Bit 1 Byte	Output object of the logic. DPT corresponds to the setting

Table 37: Communication objects – Logic

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5 Operating via the buttons on the device

If the standby display has been activated, the following image appears in the standby display (for the Time with sunrise/sunset setting):

The four blue buttons are not labelled, so they are described in the following as **1**, **2**, **3** and **4** for better understanding (see illustration).

If the device is in standby mode, the first level **"Main menu"** appears after pressing button 1 once. Here you can switch between the **"Function levels/categories"** and the **"Settings"** by pressing button 1 again.

Main menu „Function levels / Categories":
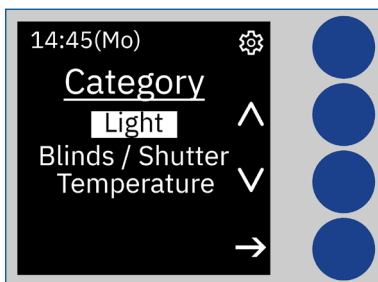
The function **"Function levels / Categories"** that have been assigned at least once according to the **"Function level/category"** parameter are listed.
The displayed texts are set in the "Display settings" menu, see 4.3   Display settings.

Use buttons 2 and 3 to select the corresponding category and press button 4 to call it up. All functions assigned to this category appear there:

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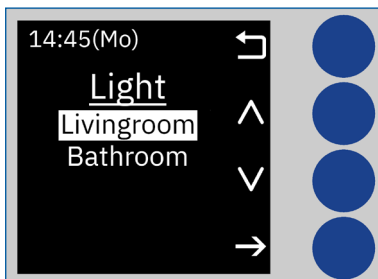
The required function can now be selected using buttons 2 and 3 and called up by pressing button 4:
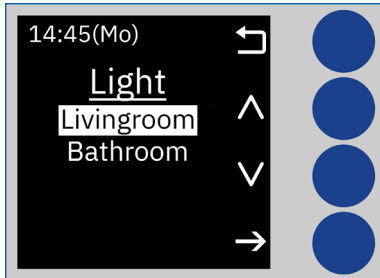
Pressing button 4 again takes you to the timer level. Buttons 2 and 3 can now be used to select the timer (1-8) and the current settings become visible:
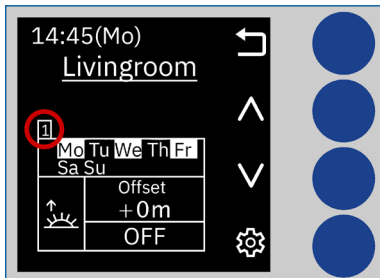
After selecting a switching time (switching time 1 in the example), pressing button 4 takes you to the level for making changes to the selected switching time:
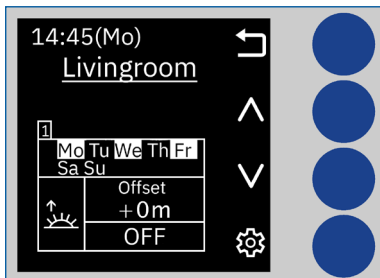
The position to be changed flashes red. Use buttons 2 and 3 to change the parameter and button 4 to jump to the next position.

Important: Changes are only saved if button 4 is pressed once through each setting and the "gear" symbol is displayed at the bottom right at the end. If you cancel beforehand by pressing button 1 (symbol "X"), the previous settings remain valid!

Important: In this level, the display remains active (does not switch to standby) until you leave the level.

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Function names are highlighted in red if they are locked (via lock or holiday):
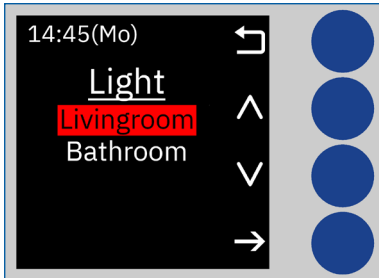
Function names are highlighted in blue for "Behaviour like Sunday (public holiday or holiday)":
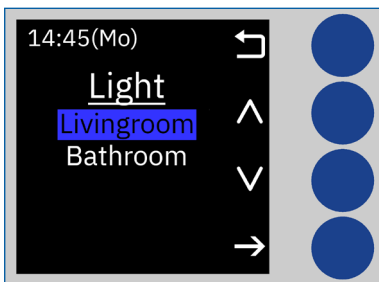
Main menu "Settings":

Use buttons 2 and 3 to select the desired setting for time, holiday and reset. Press button 4 to switch to the corresponding level. Press button 1 to switch to the higher level.

Setting "Date/Time":
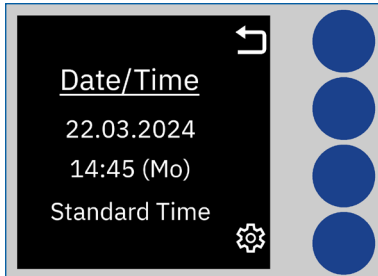
The time and date can be changed here (not available when configured as a "slave").
Pressing button 4 takes you to the level to change the settings. Each further press of button 4 switches to the position to be changed, which flashes red. Press buttons 2 and 3 to make the changes.

Important: Changes are only saved if button 4 is pressed once through each setting and the "gear" symbol is displayed at the bottom right at the end. If you cancel beforehand by pressing button 1 (symbol "X"), the previous settings remain valid!

Setting "Holiday":
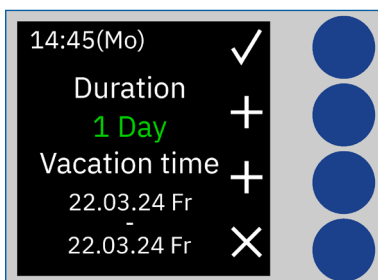
Press button 2 ("Duration") to add 1 day at a time. Press button 3 ("Holiday time") to shift the set period by one day at a time. Press button 4 to delete the settings. Press button 1 to save the settings and exit the level.

Setting „Reset":

Press button 1 to reset all changes at the Time Switch and the settings made in the ETS are referred to.

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Switching between **"Manual/automatic on device"** and **"Lock on device"**
If the two parameters have been activated in the basic settings in the "Menu/timer functions" menu, the following symbols appear at the level of the selected function:

Symbol	Description
🔒	Lock active
🔓	Lock not active
Ⓐ	Automatic mode
Ⓐ	Automatic OFF because function is locked
✋	No action
✋	Manual, only sends 0 (only visible for functions switching via 1 bit)
✋	Manual, only sends 1 (only visible for functions switching via 1 bit)
🧳	Lock due to holiday
🧳	If holiday and "behaviour like Sunday"
🍸	If public holiday and "behaviour like Sunday"

Table 38: Legend – Symbols in the display

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6.2 List of tables

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7 Appendix

7.1 Legal provisions

The devices described above must not be used in conjunction with devices which directly or indirectly serve human, health, or life-safety purposes. Furthermore, the devices described must not be used if their use may cause danger to people, animals, or property.
Do not leave the packaging material carelessly lying around. Plastic foils/ bags etc. can become a dangerous toy for children.

7.2 Disposal

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

7.3 Assembly

Danger to life from electric current!

The device may only be installed and connected by qualified electricians. Observe the country-specific regulations and the applicable KNX guidelines

The devices are approved for operation in the European Union and in the United Kingdom. The products are respectively marked with the CE and UKCA symbols.

Use in the USA and Canada is prohibited!

7.4 History

V1.0	First version of the manual	DB V2.0	04/2021
V1.1	Adaptations to new database, extension of languages	DB V2.1	05/2024

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