

Technical Manual



MDT

Time Switch

SCN-RTC20.01

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2 Overview

2.1 Overview Devices

The manual refers to the following time switches (order number printed in bold letters):

SCN-RTC20.01 – Time Switch with LCD-Display, 6SU

- Time Switch with 20 channels, 6 cycle times each channel
- Direct switching of the 20 channels (Manual Mode)
- Daily/weekly/astro switching function
- Large LCD Display
- Power reserve
- Cycle time adjustable by the ETS and directly at the device
- Cyclic sending of the time on the KNX bus (Master)
- Clock time adjustment by bus telegram (Slave)
- 8 logical blocks with 4 inputs

2.2 Usage & Areas of application

The time switch can operate as master and pretend the time for other devices at the bus or receive the time from other devices in the slave-mode.

Up to 20 functions can be connected with up to 6 cycle times. All adjusted functions can be named individually and switched directly on the device. Furthermore the time switch contains of an astro and random function.

The settings can be made via the ETS and at the device itself. Thus, functions, switching times or functions can be changed quickly and easily.

With the logic functions up to 8 And- / Or and XOR functions can be realized. Each logic up to 8 inputs can be assigned.

2.3 Exemplary Circuit diagram

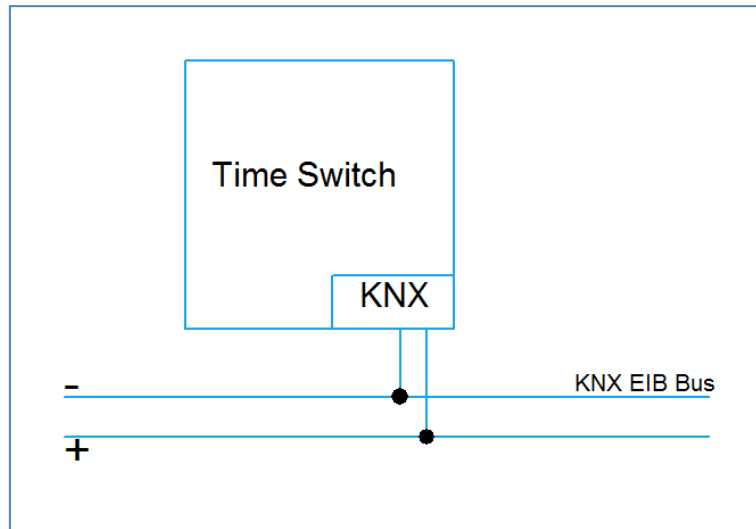


Figure 1: Exemplary circuit diagram

2.4 Design & Usage

The following figure provides an overview of the structure and controls:

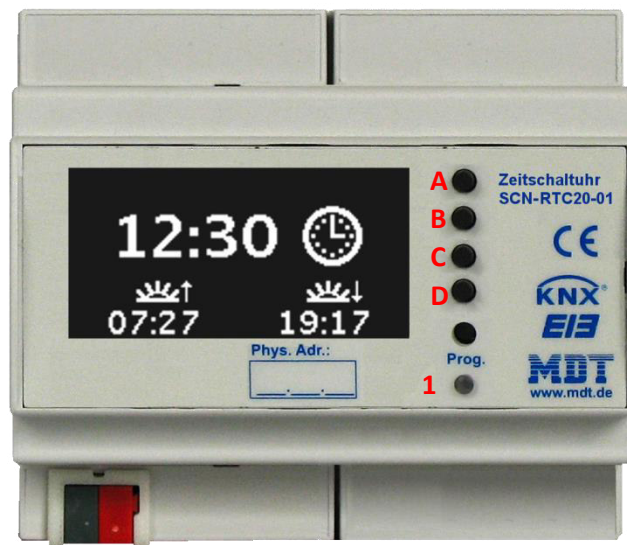


Figure 2: Design & Usage

1 = Programming Button & Programming LED

Buttons A-D = Buttons for menu navigation and executing switching functions

Press any key A-D for cancelling the standby and calling the function menu of the timer.

2.5 Functions

The functions of the time switch are divided into the following areas:

- **Setup general**
The general settings of the device are made here, such as the device startup time, the language of the display and the LCD display.
- **Time settings**
In this menu, the time switch can be set as master or as slave and the sending condition of the time can be set. Furthermore, the location data for the astro function can be made here. Moreover, a time clock can be set which allows cyclic switching functions.
- **Functions of time switch**
Up to 20 functions can be activated and parameterized further. Furthermore, for each function up to 6 cycle times can be adjusted.
- **Logikeinstellungen**
8 logic functions using XOR, AND, OR can be activated and send 1-bit values, 1-byte values or calling scenes.

2.6. Settings at the ETS-Software

Selection at the product database:

Manufacturer: MDT Technologies

Product family: Control

Product type: Time switch

Medium Type: Twisted Pair (TP)

Product name: SCN-RTC20.01

Order number: SCN-RTC20.01

2.7. Starting up

After wiring the allocation of the physical address and the parameterization of every channel follow:

- (1) Connect the interface with the bus, e.g. MDT USB interface
- (2) set bus power up
- (3) Press the programming button at the device (red programming LED lights)
- (4) Loading of the physical address out of the ETS-Software by using the interface (red LED goes out, as well this process was completed successful)
- (5) Loading of the application, with requested parameterization
- (6) If the device is enabled you can test the requested functions (also possible by using the ETS-Software)

3 Communication objects

3.1 Summary and Usage

3.1.1 Time

Nr.	Name	Object function	Data type	Direction	Info	Usage	Tip
Objects for time of day:							
0	Time	Send/Receive state	DPT 10.001	receive/ send	Master = Time switch sends time; Slave = Time switch receives time	Time switch, group monitor (once), Visu	Communication object is always shown and sends/receive the time
1	Date	Send/Receive state	DPT 11.001	receive/ send	Master = Time switch sends date; Slave = Time switch receives date	Time switch, group monitor (once), Visu	Communication object is always shown and sends/receive the date
2	Date and Time	Send/Receive state	DPT 19.001	receive/ send	Master = Time switch sends time and date; Slave = Time switch receives time and date	Time switch, group monitor (once), Visu	Communication object is always shown and sends/receive the time and date

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105	Time cycle	Minute cycle	DPT 1.001	send	Time switch sends a 1-telegram every minute	synchronization, calling cyclic functions	Object is shown when the function „Cycle programs and Time cycle” is activated
106	Time cycle	Hour cycle	DPT 1.001	send	Time switch sends a 1-telegram every hour	synchronization, calling cyclic functions	Object is shown when the function „Cycle programs and Time cycle” is activated
107	Time cycle	Day cycle	DPT 1.001	send	Time switch sends a 1-telegram every day	synchronization, calling cyclic functions	Object is shown when the function „Cycle programs and Time cycle” is activated
108	Cycle 1	Send	DPT 1.001	send	Timer sends telegrams after activation	cyclic functions, creating impulse	Object is shown when cycle 1 is activated in the menu time setting
109	Cycle 2	Send	DPT 1.001	send	Timer sends telegrams after activation	cyclic functions, creating impulse	Object is shown when cycle 2 is activated in the menu time setting
110	Cycle 1	Start/Stop	DPT 1.010	receive	Start/Stop cycle 1	cyclic functions, creating impulse	Object is shown when cycle 1 is activated in the menu time setting

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110	Cycle 2	Start/Stop	DPT 1.010	receive	Start/Stop cycle 1	cyclic functions, creating impulse	Object is shown when cycle 2 is activated in the menu time setting
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Table 1: Overview communication objects - time

3.1.2 Time Switch

Nr.	Name	Object function	Data type	Direction	Info	Usage	Tip
Objects, which can be sent from the time switch:							
3	Channel 1	Switch On/Off	DPT 1.001	send	Timer sends current value	Actuator...	Timer sends switching command
3	Channel 1	Day/Night switch	DPT 1.001	send	Timer sends current value	Actuator...	Timer sends day/night switchover
3	Channel 1	Send value (0..255)	DPT 5.005	send	Timer sends current value	Actuator...	Timer sends value(0-255)
3	Channel 1	Send value (0..100%)	DPT 5.001	send	Timer sends current value	Actuator...	Timer sends value(0-100%)
3	Channel 1	Send HVAC Mode	DPT 20.102	send	Timer sends current value	Temperature Controller...	Timer sends HVAC Mode for operating mode switchover
3	Channel 1	Send temperature value	DPT 9.001	send	Timer sends current value	Temperature Controller, Heating actuator...	Timer sends temperature setpoint
3	Channel 1	Dimming On/Off	DPT 1.001	send	Timer sends current value	Dimming actuator...	On/Off command for dimming
3	Channel 1	Shutter Down/Up	DPT 1.008	send	Timer sends current value	Shutter actuator...	Up/Down command for shutter

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4	Channel 1	Dimming	DPT 3.007	send	Timer sends current value	Dimming actuator...	relative dimming command for dimming
4	Channel 1	Stop/Slats Open/Close	DPT 1.009	send	Timer sends current value	Shutter actuator...	moving command for shutter
5	Channel 1	Status dimming value	DPT 5.001	receive	Timer sends current value	Actuator...	timer receives current dimming value
5	Channel 1	Status absolute position	DPT 5.001	receive	Timer sends current value	Actuator...	timer receives current position of the shutter
5	Channel 1	Scene	DPT 17.001/ DPT 18.001	send	Timer sends current value	Actuator...	timer sends scene number
+3	next channel (same functions as channel 1)						
63	Lock 1	Lock time switch	DPT 1.003	receive	blocking time switch channels	Push Button, Visu...	blocks the channels, which are set for this blocking function
64	Lock 2	Lock time switch	DPT 1.003	receive	blocking time switch channels	Push Button, Visu...	blocks the channels, which are set for this blocking function

Table 2: Overview communication objects - time switch

3.1.3 Logic setting

Nr.	Name	Object function	Data type	Direction	Info	Usage	Tip
Objects for the logic settings:							
65	Logic A	Input logic 1	DPT 1.002	receive	logic input	Connection with every 1-Bit object possible	Object is only shown if logic A and logic input 1 is active
66	Logic A	Input logic 2	DPT 1.002	receive	logic input	Connection with every 1-Bit object possible	Object is only shown if logic A and logic input 2 is active
67	Logic A	Input logic 3	DPT 1.002	receive	logic input	Connection with every 1-Bit object possible	Object is only shown if logic A and logic input 3 is active
68	Logic A	Input logic 4	DPT 1.002	receive	logic input	Connection with every 1-Bit object possible	Object is only shown if logic A and logic input 4 is active
69	Logic A	Output switch	DPT 1.001	send	logic output	Connection with every 1-Bit object possible: LED, actuator...	Object is only shown if logic A with object type "switch" is active
69	Logic A	Output scene	DPT 17.001	send	logic output	Connection with every scene- object possible	Object is only shown if logic A with object type "scene" is active
69	Logic A	Output value	DPT 5.005	send	logic output	Connection with every 1-Byte object possible	Object is only shown if logic A with object type "value" is active
+5	next logic	same function as logic A available					

Table 3: Overview communication objects - logic functions

3.2 Default settings of the communication objects

The respective table shows the default values for the communication objects. According to requirements the priority of the particular communication objects as well as the flags can be adjusted by the user. The flags allocates the function of the objects in the programming thereby stands C for communication, R for Read, W for write, T for transmit and U for update.

3.2.1 Time

Default settings									
Nr.	Name	Object Function	Length	Priority	C	R	W	T	U
0	Time	Send/Receive state	3 Byte	Low	X	X		X	
1	Date	Send/Receive state	3 Byte	Low	X	X		X	
2	Date and Time	Send/Receive state	8 Byte	Low	X	X		X	
105	Time cycle	Minute cycle	1 Bit	Low	X				
106	Time cycle	Hour cycle	1 Bit	Low	X			X	
107	Time cycle	Day cycle	1 Bit	Low	X			X	
108	Cycle 1	Send	1 Bit	Low	X	X		X	
109	Cycle 2	Send	1 Bit	Low	X	X		X	
110	Cycle 1	Start/Stop	1 Bit	Low	X		X	X	
111	Cycle 2	Start/Stop	1 Bit	Low	X		X	X	

Table 4: Default settings of the communication objects - time

3.2.2 Time Switch

Default settings									
Nr.	Name	Object Function	Length	Priority	C	R	W	T	U
3	Channel 1	Switch On/Off	1 Bit	Low	X	X		X	
3	Channel 1	Day/Night switch	1 Bit	Low	X	X		X	
3	Channel 1	Send value (0..255)	1 Byte	Low	X	X		X	
3	Channel 1	Send value (0..100%)	1 Byte	Low	X	X		X	
3	Channel 1	Send HVAC Mode	1 Byte	Low	X	X		X	
3	Channel 1	Send temperature value	1 Byte	Low	X	X		X	
3	Channel 1	Dimming On/Off	1 Bit	Low	X	X		X	
3	Channel 1	Shutter Down/Up	1 Bit	Low	X	X		X	
4	Channel 1	Dimming	4 Bit	Low	X	X		X	
4	Channel 1	Stop/Slats Open/Close	1 Bit	Low	X	X		X	
5	Channel 1	Status dimming value	1 Byte	Low	X		X		
5	Channel 1	Status absolute position	1 Byte	Low	X		X		
5	Channel 1	Scene	1 Bit	Low	X	X		X	
+3	next function								
63	Lock 1	Lock Time Switch	1 Bit	Low	X		X	X	
64	Lock 2	Lock Time Switch	1 Bit	Low	X		X	X	

Table 5: Default settings of the communication objects - time switch

3.2.3 Logic functions

Default settings									
Nr.	Name	Object Function	Length	Priority	C	R	W	T	U
65	Logic A	Input logic 1	1 Bit	Low	X		X	X	
66	Logic A	Input logic 2	1 Bit	Low	X		X	X	
67	Logic A	Input logic 3	1 Bit	Low	X		X	X	
68	Logic A	Input logic 4	1 Bit	Low	X		X	X	
69	Logic A	Output switch	1 Bit	Low	X	X		X	
69	Logic A	Output scene	1 Byte	Low	X	X		X	
69	Logic A	Output value	1 Byte	Low	X	X		X	
+5	next logic								

Table 6: Default settings of the communication objects - logic functions

4 Parameter

4.1 General settings

Following the general settings are shown, which affect to all functions of the time switch:

Startup delaytime	0 s
Language	German
Standby display	time
Standby time	20 s
Query of time after reset	yes

Figure 3: Menu general settings

The chart shows the dynamic range of the available parameters:

ETS-text	Dynamic range [default value]	comment
Startup delaytime	0-60s [0s]	defines the time between a restart and the functional start of the device
Language	<ul style="list-style-type: none"> ▪ German ▪ English 	Selection of the language of the LCD-Display
Standby display	<ul style="list-style-type: none"> ▪ time ▪ switched off 	defines the functional block, which is called after a restart
Standby time	never-60s [20s]	defines the time between the last key press and the activation of the standby mode
Query of time after reset	<ul style="list-style-type: none"> ▪ No ▪ Yes 	defines if the time should be displayed after a reset

Table 7: General settings

4.2 Time settings

The following figure shows the menu „Time settings“:

System time mode	Master
Send system time cyclical	each 1 h
Time change	allow winter and summer time
Cycle programs and Time cycle	active
Times for cycle 1	active
Permanent ON	
Hours	0
Minutes	10
Seconds	0
Permanent OFF	
Hours	0
Minutes	10
Seconds	0
Times for cycle 2	inactive
Location determination by	place
Country	Belgium
Town	Antwerp

Figure 4: Menu "Time settings"

The following settings are available for the time of day:

ETS-text	Dynamic range [default value]	comment
System time mode	<ul style="list-style-type: none"> ▪ Master ▪ Slave 	<p>Master: The timer sends the time for all devices at the KNX-system.</p> <p>Slave: The timer receives the time from any master device.</p>
At Master mode: Send system time cyclic:	<ul style="list-style-type: none"> ▪ never ▪ 10min – 24h [1h] 	defines the sending interval of the time(setting only for master mode available)
At Slave mode: Query time after reset	<ul style="list-style-type: none"> ▪ No ▪ Yes 	defines if the time should be queried after a reset(setting only for slave mode available)
Time change	<ul style="list-style-type: none"> ▪ allow winter and summer time ▪ no winter and summer time 	defines if the timer switches automatically between summer to winter time

Table 8: Settings time

In addition to the settings for the time settings, the settings for the astro function can be made in this menu. The astro function allows the calculation of sunrise and sunset times. Sunrise and sunset can then be used for time switch channels as cycle time.

The following settings are available:

ETS-text	Dynamic range [default value]	comment
Location determination by	<ul style="list-style-type: none"> ▪ place ▪ coordinates 	Adjustment if the location should be determined by place or coordinates
Determination by place:		
Country	Adjustment of the country	
Town	Adjustment of the town	
Determination by coordinates:		
Latitude	<ul style="list-style-type: none"> ▪ north ▪ south 	Determining whether north or south latitude to be counted
Latitude in degrees	▪ 0-90°	Determination of the latitude
Latitude in minutes	▪ 0'-59'	Determination of the minutes
Longitude	<ul style="list-style-type: none"> ▪ east ▪ west 	Determining whether east or west longitude to be counted
Longitude in degrees	▪ 0-180°	Determination of the longitude
Longitude in minutes	▪ 0'-59'	Determination of the minutes
Time difference from universal time(UTC+...)	Adjustment of the time zone	

Table 9: Adjustment of the astro function

The following table shows the relevant communication objects. At the slave mode, the timer must receive the state on the objects. At the master mode, the timer sends the current state on the objects.

Number	Name	Length	Usage
0	Time	3 Byte	Send receive of the time
1	Date	3 Byte	Send receive of the date
2	Date and Time	8 Byte	Send receive of the date and time

Table 10: Communication objects - Date/Time

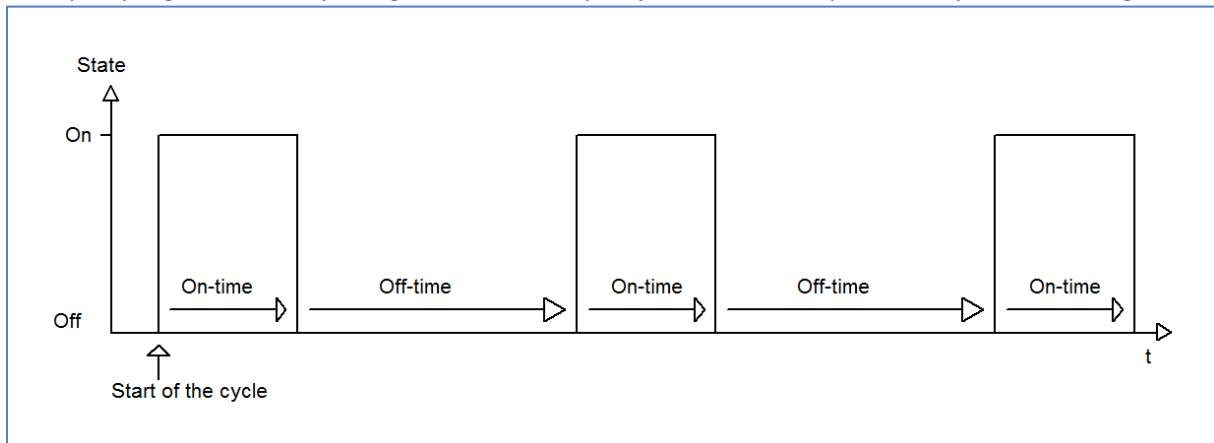
The following picture shows the time in the standby mode:



- 1 = calculated sunrise
- 2 = calculated sunset

Furthermore, the timer can send a time cycle and two cycle programs. The time cycle sends cyclic (every minute/hour/day) a 1-telegram and can be used for synchronization or starting cyclic functions.

The cycle program starts by using the "Start-/Stop-object" and sends periodically On-/Off-telegrams:



The first On-pulse is send directly after sending a start-command and is hold for the adjusted on-time. Afterwards the Off-pulse is sent for the adjusted off-time and the cycle is restarted. The cycle program runs until a stop command is sent. For example, cycle programs can be started by the time cycle or at a determined time by the time switch.

The following communication objects are available for the time cycle and the cycle programs:

Number	Name	Length	Usage
105	Minute cycle	1 Bit	Sending a 1-signal every minute, every full minute
106	Hour cycle	1 Bit	Sending a 1-signal every hour, every full hour
107	Day cycle	1 Bit	Sending a 1-signal every day, always at 0:00AM
108	Cycle 1	1 Bit	Sends after the start of this cycle, a 1-signal for the set time and then a 0 signal for the set time, cycle runs periodically until the cycle is stopped
109	Cycle 2	1 Bit	see cycle 1
110	Cycle 1 - Start/Stop	1 Bit	Starts (= 1 command) or stops (= 0 command) the cyclical transmission of Cycle 1
111	Cycle 2 - Start/Stop	1 Bit	Starts (= 1 command) or stops (= 0 command) the cyclical transmission of Cycle 2

Table 11: Communication objects - time cycle and cycle program

4.3 General time-switch settings

The following picture shows the menu “Functions of Time Switch” in which the general settings for the time switch can be done:

Description of menu "Time Switch"	Zeitschaltuhr
Settings for Time Switch	manual input and via application
Catch up switch times on restart	inactive
Catch up switch times at time change	inactive
Catch up switch times at unlocking	inactive
Description of funnction "Switch"	Schalten
Description of funnction "Dimming"	Dimmen
Description of funnction "Shutter"	Jalousie
Description of funnction "Scenes"	Szenen
Description of funnction "Values"	Werte
Channel 1	active
Channel 2	inactive
Channel 3	inactive
Channel 4	inactive
Channel 5	inactive

Figure 5: Menu "Functions of the time-switch"

The following table shows the available settings:

ETS-text	Dynamic range [default value]	comment
Description of menu "Time Switch"	Zeitschaltuhr	Adjusting the name, which is displayed for the menu time switch
Settings for time switch	<ul style="list-style-type: none"> ▪ fixed via application ▪ manual input and via application ▪ only manual input 	<p>fixed via application: Switching times can only be set in the database and cannot be changed in the device.</p> <p>manual input and via application: Switching times can be set in the database and in the device.</p> <p>only manual input: Switching times can only be set in the device.</p> <p>Please Note: At the settings with manual input, the times must be confirmed after every programming!</p>
Catch up switch times at restart	<ul style="list-style-type: none"> ▪ inactive ▪ active 	defines if the timer sends all valid states after a reset
Catch up switch times at time change	<ul style="list-style-type: none"> ▪ inactive ▪ active 	defines if the timer sends all missed out switching states after a time shift into "future"
Catch up switch times at unlocking	<ul style="list-style-type: none"> ▪ inactive ▪ active 	defines if the time switch sends all missed out switching states after unlocking
Assignment of the function groups:		
Description of function „Switch“	Schalten	Determining of the function name, which is displayed for all functions of the function group: switch - 1 bit
Description of function „Dimming“	Dimmen	Determining of the function name, which is displayed for all functions of the function group: Dimming
Description of function „Shutter“	Jalousie	Determining of the function name, which is displayed for all functions of the function group: Shutter
Description of function „Scenes“	Szenen	Determining of the function name, which is displayed for all functions of the function group: Scenes
Description of function „Values“	Werte	Determining of the function name, which is displayed for all functions of the function group: Values
Activation of the channels:		
Channel 1-20:	<ul style="list-style-type: none"> ▪ inactive ▪ active 	activates/deactivates the submenu for channel 1 of the time switch, 4.4 Function settings – Time Switch

Table 12: Settings Time Switch

Function catch up switch times:

Making up the switching states allows setting if switching states that were left out due to unscheduled events are made up.

- **Catch up switch times on restart**
After a restart, the latest switching states are made up, i.e. the timer produces the state which should be active at this time.
- **Catch up switch times at time change**
At a time leap forward, i.e. a time adjustment +.. min / h, the switching operations that were left out due to time jump rescheduled. At a time jump up to + 90min all switching events are made up. At a time jump of 90 minutes only the last of each channel.
- **Catch up switch times at unlocking**
After unlocking, the switching states are rescheduled, which were left out during the device was locked. This ensures that all trades are in "real" state after unlocking.

Assignment to the function groups:

The names are displayed in the device as headings for the various functional groups for each function group:



See also: 4.5 Controlling the timer on the device.

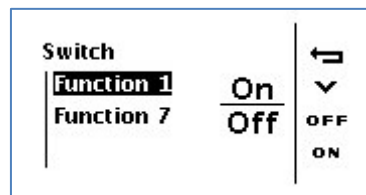
4.4 Function settings – Time Switch

The following picture shows the submenu „Function setting Channel 1-20” in which each channel can be defined and the cycle times can be set for each channel:

Description of function in the display	Funktion 1
Key function	send value
Subfunction	send 1Bit value (On/Off)
Switch function	Button C = Off / Button D = On
Enable the locking of time switch	Inactive
Time Switch 1	active
Mode	with sunrise
Switching time move to ... minutes	0
Weekdays	Monday to Sunday
Action applies to	Button C

Figure 6: Menu - Time switch

The parameter “Description of function in the display” defines the name of the function, which is displayed in the device. In this example, the function 1 is set as switching function (send value – 1 Bit) with the description “Function 1”. So the function is shown in the device as follows:



4.4.1 Key function

Function group: Send value

The function group is divided in several sub functions:

Send 1 Bit value (On/Off):

The following picture shows the sub function Switch On/Off:

Key function	send value
Subfunction	send 1Bit value (On/Off)
Switch function	Button C = Off / Button D = On

Figure 7: Send value/Send 1 Bit value (On/Off)

The function is assigned to the function group switch. The parameter “Switch function” assigns the commands On/Off to the keys.

1 Bit-Day/Night switch:

The function is assigned to the function group switch. The parameter “Setting for the values” assigns the commands to the keys.

Send 1 Byte Value (0-255):

Key function	send value
Subfunction	send 1Byte value (0-255)
Value at activation of button C	0
Value at activation of button D	0

Figure 8: Send value/Send 1 Byte value(0..255)

The function is assigned to the function group values. The parameter “Value at activation of button C/D” assigns the values to the key.

Send 1 Byte Value (0-100%):

Same functionality as send 1 byte value (0..255), only with percent values.

Send HVAC Mode:

Key function	send value
Subfunction	send HVAC Mode
Value at activation of button C	Comfort
Value at activation of button D	Comfort

Figure 9: Send value/Send HVAC Mode

Function sends the adjusted mode for the adjusted key according to DPT20.102-HVAC mode.

Send temperature value:

Key function	send value
Subfunction	send temperature value (°C)
Send temperature value as	Setpoint
Value at activation of button C	21,0 °C
Value at activation of button D	21,0 °C

Figure 10: Send value/Send temperature value

The sub function “Send temperature value” can send as well a new set point as a set point value offset. At the setting “Send temperature value as setpoint”, the value is sent as DPT9.001. At the setting “Send temperature value as setpoint value offset”, the value is sent as DPT9.002. The temperature value can be set for each key.

Function group: Dimming

The following picture shows the available settings for the key function dimming:

Key function	Dimming
Dimming function	Button C = darker / Button D = brighter

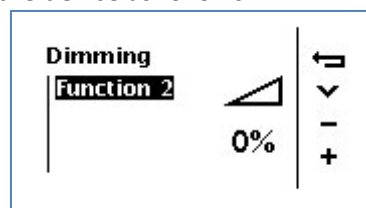
Figure 11: Key function dimming

The following table shows the available communication objects:

Number	Name	Length	Usage
3	Dimming on/off	1 Bit	Switching function = function of the time switch
4	Dimming	4 Bit	dimming relative via the keys
5	Status dimming value	1 Byte	Feedback on current dimming value for the key-operated control

Table 13: Communication objects time switch-dimming

The dimming function is shown in the device as follows:



The state of the dimming actuator is used for the feedback of the current dimming value and is shown in the device by the symbol and in percent.

Function group: Shutter

The following picture shows the available settings for the function group shutter:

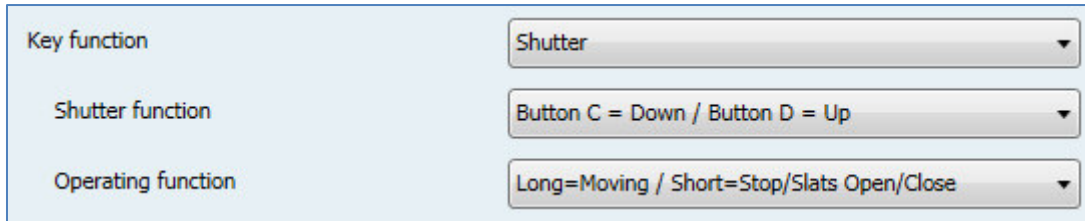


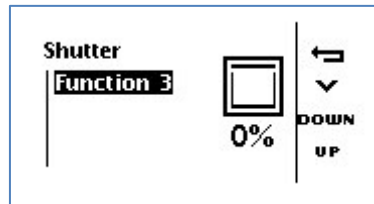
Figure 12: Function group shutter

The following table shows the relevant communication objects:

Number	Name	Length	Usage
3	Shutter Down/Up	1 Bit	Moving function = function for the time switch
4	Stop/Slats Open/Close	4 Bit	Movement of the slats/ stops an Up/Down movement
5	Status absolute position	1 Byte	Feedback on the current position of the blind for operation with keys

Table 14: Communication objects time switch - shutter

The shutter function is shown in the device as follows:



The state of the shutter actuator is used for the feedback of the current position, which is shown in the symbol and as percent value.

Function group: Scenes

The following picture shows the available settings for the function group scenes:

Key function	Scene
Subfunction	save
Button C Scene number	1
Button D Scene number	1

Figure 13: Function group Scene

The following table shows the relevant communication objects:

Number	Name	Length	Usage
5	Scene	1 Byte	Calling/Saving Scenes

Table 15: Communication objects time switch - scene

The scene function is shown in the device as follows:



4.4.2 Assignment of cycle times

The following picture shows the parameter for assigning cycle times to the functions. In this example, the function, which is assigned to button C, is executed weekdays at 6:30AM and at the weekend at 8:00AM:

Enable the locking of time switch	Inactive
Time Switch 1	active
Mode	depending on the time
Hours	6
Minutes	30
Weekdays	Monday to Sunday
Action applies to	Button C
Time Switch 2	active
Mode	depending on the time
Hours	8
Minutes	0
Weekdays	Saturday to Sunday
Action applies to	Button C

Figure 14: Assignment of time switches

The following table shows the available settings:

ETS-text	Dynamic range [default value]	comment
Enable the locking of time switch	<ul style="list-style-type: none"> ▪ inactive ▪ for lock object 1 ▪ for lock object 2 ▪ for lock object 1 & 2 	Adjustment if the time switch can be locked via the lock objects
Time Switch 1-6	<ul style="list-style-type: none"> ▪ active ▪ inactive 	activates the time switch for this channel
Mode	<ul style="list-style-type: none"> ▪ depending on time ▪ with sunrise ▪ with sunset ▪ randomt 	determines whether the timer switches at a certain time with the sunrise / sunset, or in a random period of time
Hours	0-23	defines the hours of the time (only at mode: depending on time and random)
Minutes	0-59	defines the minutes of the time (only at mode: depending on time and random)
Minute range for random events	<ul style="list-style-type: none"> ▪ +/- 10min ▪ +/- 20min ▪ +/- 30min ▪ +/- 60min 	only available at mode: random specifies the period of time about the adjusted time in which the switching event is executed
Weekdays	<ul style="list-style-type: none"> ▪ Monday to Sunday ▪ Monday to Friday ▪ Saturday to Sunday ▪ Monday, Tuesday... 	defines the day on which the timer is running
Action applies to	<ul style="list-style-type: none"> ▪ Button C ▪ Button D 	Select the function to be executed at the adjusted switching time. It is always the action performed, which is assigned to this key.

Table 16: Assignment of cycle times

The following table shows the relevant communication objects for the locking function:

Number	Name	Length	Usage
63	Lock 1	1 Bit	Locks the timer
64	Lock 2	1 Bit	Locks the timer

Table 17: Communication objects time switch scenes

The locking function blocks the timer for the channels with activated locking function.

4.5 Controlling the timer on the device

For getting into the menu of the timer, press the left button as long as this menu appears:



Button 1 = Exit the menu

Button 2/3 = Choosing the menu

Button 4 = Calling the menu

In the picture above, button 4 calls the menu to adjust the date and time.

By pressing button 4 in the following setting, all timers are reset:



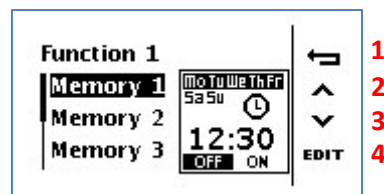
The cycle times are reset to the values, which are set by the ETS-Software. If the parameter "Setting of Time Switch" is set to "only manual input", see: 4.3, all timers are deactivated.

By pressing button 4 in the following setting, the menu for setting the timers is opened:

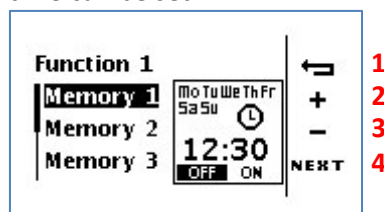


At the first step, the function group (Switch, Shutter,...) can be selected. By selecting a function group, all channels are shown, which are sorted into this group. Now, the channel can be selected.

Afterwards the following menu is shown:



By pressing button 4-Edit, the cycle time can be set:



1 = Cancel setting

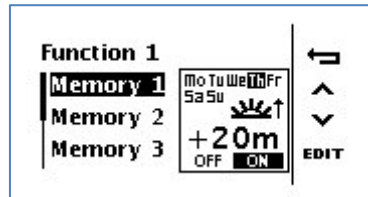
2/3 = Setting in the currently selected menu

4 = select next menu

At setting the cycle time, the following steps are passed:

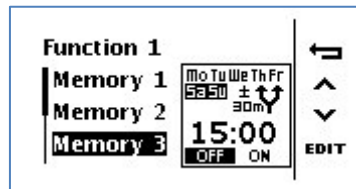
- 1.) Setting the days on which the timer is executed.
- 2.) Set the mode of the timer(time, sunrise, sunset, random, here: time)
- 3.) Setting the time
- 4.) Set the action which should be executed

At the mode sunrise, the configuration menu is as follows:



In this example, the timer sends every Thursday 20min after sunrise an On-command.

At the mode random, the configuration menu is as follows:



In this example, the timer sends every Saturday and Sunday between 14:30 and 15:30 an Off-command.

4.6 Logic functions

The following picture shows the available settings for the logic function:

Query logic objects after reset	active
Setting Logic A	OR
Object type for logic output	Value
1Byte Value	0
Input logic 1	switched on normally
Input logic 2	switched on normally
Input logic 3	switched on normally
Input logic 4	switched on normally
Setting Logic B	switched off
Setting Logic C	switched off
Setting Logic D	switched off
Setting Logic E	switched off
Setting Logic F	switched off
Setting Logic G	switched off
Setting Logic H	switched off

Figure 15: Logic functions

4.6.1 Behavior after rest

The parameter “Query logic objects after reset” is valid for logic A to H and defines whether the logic inputs are queried after a reset. The settings have the following meaning:

- **inactive**
The input objects are not queried after a reset and will be initialized with the value 0.
- **active**
The input objects are queried after a reset and accepted with its current value.

4.6.2 Settings Logic A-H

The logic function and the output object can be set for each logic A-H:

ETS-text	Dynamic range [default value]	comment
Setting Logic A	<ul style="list-style-type: none"> ▪ switched off ▪ AND ▪ OR ▪ XOR 	switched off: deactivates logic A AND: The inputs are logically AND linked OR: The inputs are logically OR linked XOR: The inputs are logically XOR linked
Object type for logic output	<ul style="list-style-type: none"> ▪ Switch ▪ Scene ▪ Value 	The selection of the logic output defines the DPT of the output object

Table 18: Settings logic

According to the adjusted settings, the additional settings are shown.

The settings for the output 1-Bit look as follows:

ETS-text	Dynamic range [default value]	comment
Object type for logic output	Switch	adjusted output object: 1 Bit
Send condition	<ul style="list-style-type: none"> ▪ not automatically ▪ change of input ▪ change of output ▪ change of output only value = 1 ▪ change of output only value = 0 	Setting when the value of the output is sent. Not automatically: no send, only request Change of input: Send at every change of the input Change of output: Send at every change of the outputs Change of output only value = 0/1: Send at change of the output with additional filter
Invert output	<ul style="list-style-type: none"> ▪ no ▪ yes 	Inverts the output (0→1, 1→0)

Table 19: Settings logic output - switch

The following table shows the object for the logic output, when it is set to switch:

Number	Name	Length	Usage
69	Output switch	1 Bit	Output object of the logic

Table 20: Logic output - switch

For a scene output, the settings look as follows:

ETS-text	Dynamic range [default value]	comment
Object type for logic output	Scene	adjusted output object: Scene
Scene number	1-64 [2]	Adjusting which scene is called after completing the logic function

Table 21: Setting logic output - scene

The following table shows the object which is shown when the logic output is set to scene:

Number	Name	Length	Usage
69	Output scene	1 Byte	Output object of the logic

Table 22: Logic output - scene

For a byte output, the settings look as follows:

ETS-text	Dynamic range [default value]	comment
Object type for logic output	Value	adjusted output object: Value
1 Byte-Value	0-255 [0]	Adjusting which value is sent after completing the logic function

Table 23: Setting logic output - value

The following table shows the object which is shown when the logic output is set to 1 Byte value:

Number	Name	Length	Usage
69	Output value	1 Byte	Output object of the logic

Table 24: Logic output - 1 Byte value

4.6.3 Logic inputs

Once a logic module is enabled, a submenu appears in which the inputs can be parameterized for this logic module.

The following figure shows this menu:

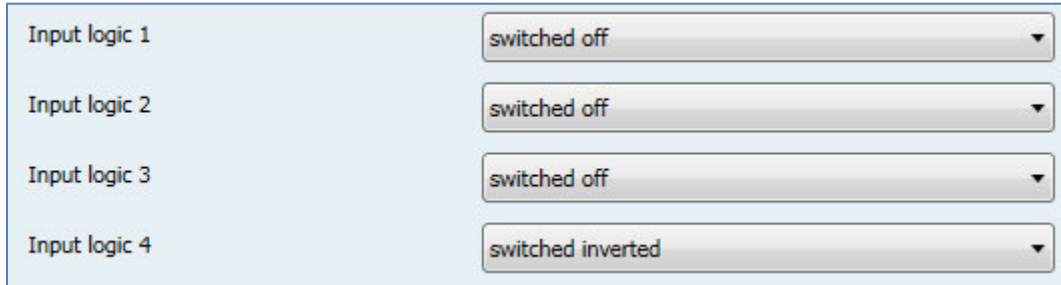


Figure 16: Logic inputs

ETS-text	Dynamic range [default value]	comment
Input logic 1-4	<ul style="list-style-type: none"> ▪ inactive ▪ active - normal ▪ active - inverted 	Setting which defines how the input is evaluated: inactive: The object for this logic object is deactivated active - normal: The object is normal active active - inverted: The object is inverted active (1→0, 0→1)

Table 25: Settings logic inputs

The following table shows the objects for the logic inputs of logic A:

Number	Name	Length	Usage
65-68	Input logic 1-4	1 Bit	Input objects for logic A

Table 26: Objects - Input logic

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6 Attachment

6.1 Statutory requirements

The above-described devices must not be used with devices, which serve directly or indirectly the purpose of human, health- or lifesaving. Further the devices must not be used if their usage can occur danger for humans, animals or material assets.

Do not let the packaging lying around careless, plastic foil/ -bags etc. can be a dangerous toy for kids.

6.2 Routine disposal

Do not throw the waste equipment in the household rubbish. The device contains electrical devices, which must be disposed as electronic scrap. The casing contains of recyclable synthetic material.

6.3 Assemblage



Risk for life of electrical power!

All activities on the device should only be done by an electrical specialist. The county specific regulations and the applicable EIB-directives have to be observed.

6.4 Datasheet

MDT Time Switch with 20 channels and LCD display, MDRC

Version		
SCN-RTC20.01	Time Switch	6SU MDRC, Time Switch with 20 channels. 6 cycle times each channel

The MDT Time switch with 20 channels (6 cycle times each channel) has a daily/weekly/astro switching function and an adequate power reserve if the bus voltage fails. The cycle times of the single channels are adjustable by the ETS or can be set directly at the device. The large LCD display for comfortable handling allows direct switching of the 20 channels (Manual Mode).

The time switch offers cyclic sending of the time on the KNX bus and clock time adjustment by bus telegram (Master-/slave mode). The 8 logical blocks with 4 inputs each allow individual conjunctions.

The MDT Time Switch is a modular installation device for fixed installation in dry rooms. It fits on DIN 35mm rails in power distribution boards or closed compact boxes.

For project design and commissioning of the MDT Time Switch it is recommended to use the ETS. Please download the application software at www.mdt.de/Downloads.html

SCN-RTC20.01



- Production in Germany, certified according to ISO 9001
- Time switch with 20 channels (6 cycle times each channel)
- Direct switching of the 20 channels (Manual Mode)
- Daily/weekly/astro switching function
- Large LCD Display
- Power reserve
- Cycle time adjustable by the ETS and directly at the device
- Cyclic sending of the time on the KNX bus (Master)
- Clock time adjustment by bus telegram (Slave)
- 8 logical blocks with 4 inputs
- Modular installation device for DIN 35mm rails
- Integrated bus coupling unit
- 3 years warranty

Technical Data	SCN-RTC20.01			
Number of channels	20			
Cycle times each channel	6			
Accuracy typ.	< 5 min/year			
Power reserve	24 hours			
Specification KNX Interface	TP-256			
Available application software	ETS 3/4/5			
Permitted wire gauge				
KNX busconnection terminal	0,8mm Ø, solid core			
Power supply	KNX bus			
Power consumption KNX Bus typ.	< 0,25W			
Operation temperature range	-10 to +50°C			
Enclosure	IP 20			
Dimensions MDRC (Space Units)	6SU			

Exemplary circuit diagram SCN-RTC20.01

