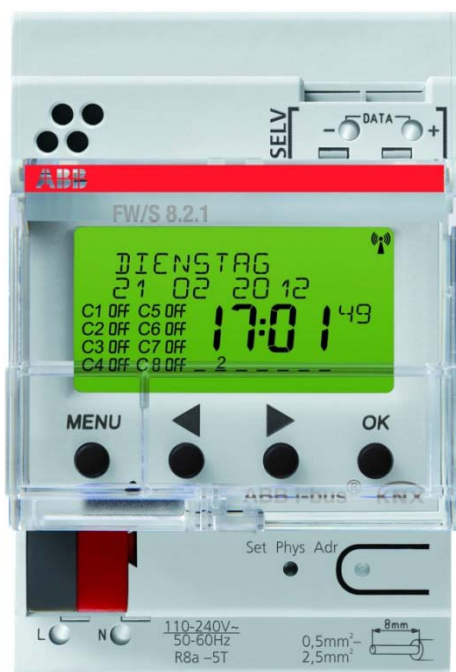# FW/S8.2.1 Radio Time Switch
8-channel, MDRC

FW/S 8.2.1	2CDG120039R0011

Contents

1 Functional characteristics

- 8 channels
- 800 switching times
- 15 weekly programs
- Daily, weekly and yearly program
- 16 special programs including Continuous ON / continuous OFF available via object
- 2 random programs
- Astronomical switching program
- ON-OFF switching times, pulse program, cycle program
- Automatic changeover summer/winter time
- Text-based operator guidance

1.1 Special features

- Can be used without mains/bus connection
- Plug-in switching program
- **DCF** via data bus*
- **GPS** via data bus*
- Programming also possible via the KNX bus (see attachment)
- Global time synchronisation
- Global positioning
- 8 year power reserve
- Each channel can be operated either with **time switch** function <u>or</u> with **astro** function.
- Two sending objects per channel
- Joint data bus connection for HS/S4.2.1 sensors and FW/S 8.2.1 clock possible (see figure).

*Power supplied by integrated power unit

Figure 1

2 Technical data

2.1 Technical data

Operating voltage KNX	Bus voltage, ≤10 mA
Operating voltage	110–240 V AC
Frequency	50 - 60 Hz
Power consumption	typ. 1 W
Standby output	min. 0.8 W
Width	3 module
Connection type	KNX bus terminal
Max. cable cross-section	2.5 mm²
Installation type	DIN-rail
Number of channels	8
Number of memory locations	800
Time accuracy	≤ ± 0.5 s/day(Quartz) or DCF77/GPS
Shortest switching time	1 s
Display	LCD
Ambient temperature	-5 °C … +45 °C
IP rating	IP 20
Protection class	II in accordance with EN 60 730-1

3 The application program "Timer Switch 8C/1.0"

3.1 Selection in the product database

Manufacturer	ABB STOTZ-KONTAKT GmbH
Product family	Controller
Product type	Timer
Program name	Timer Switch 8C/1.0

The ETS database can be found on our downloads page: www.abb.com/knx

Table 1

Number of group addresses:	254
Number of associations:	255
Number of communication objects:	121

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3.2 Communication objects

Table 2

No.	Object name	Function	Type DPT	Flags			
0	*Local time*	*transmit*	3 byte 10,001	C	R	-	T
		Receive	3 byte 10,001	C	R	W	-
1	*Local date*	*transmit*	3 byte 11,001	C	R	-	T
		Receive	3 byte 11,001	C	R	W	-
2	*UTC time*	*transmit*	3 byte 10,001	C	R	-	T
3	*UTC date*	*transmit*	3 byte 11,001	C	R	-	T
4	*Time query*	*transmit*	1 bit 1,001	C	R	-	T
		Receive	1 bit 1,001	C	R	W	-
5	*Error GPS module*	*0 = OK, 1 = Error*	1 bit 1,001	C	R	-	T
6	*Date/time (DPT 19.001)*	*transmit*	8 byte 19,001	C	R	-	T
		Receive	8 byte 19,001	C	R	W	-

Continuation:

No.	Object name	Function	Type DPT	Flags			
7	C1.1 switching channel	Switching	1 bit 1,001	C	R	-	T
		priority	2 bit 2,001	C	R	-	T
		Value	1 byte 5,010	C	R	-	T
		Percent	1 byte 5,001	C	R	-	T
		HVAC operating mode	1 byte 20,102	C	R	-	T
		Temperature in °C	2 byte 9,001	C	R	-	T
		Temperature in C	2 byte 9,002	C	R	-	T
		scene	1 byte 18,001	C	R	-	T
8	C1.2 switching channel	Switching	1 bit 1,001	C	R	-	T
		Value	1 byte 5,010	C	R	-	T
		Percent	1 byte 5,001	C	R	-	T
		HVAC operating mode	1 byte 20,102	C	R	-	T
		Temperature in °C	2 byte 9,001	C	R	-	T
		Temperature in C	2 byte 9,002	C	R	-	T
9	C1 lock	Lock = 1	1 bit 1,003	C	R	W	-
		Lock = 0	1 bit 1,003	C	R	W	-
10	C1 switching channel	Special program	1 byte 5,010	C	R	W	-
11	C1 switching channel	Operating hours feedback	2 byte 7,001	C	R	-	T
		Time to next service	2 byte 7,001	C	R	-	T
12	C1 switching channel	Service required	1 bit 1,001	C	R	-	T
13	C1 switching channel	Reset operating hours	1 bit 1,001	C	R	W	-
		Reset service	1 bit 1,001	C	R	W	-
14-62	Switching channels C2..C8						

Continuation:

No.	Object name	Function	Type DPT	Flags			
63	*C9 threshold switch input*	*0..65535*	2 byte 7,001	C	R	W	-
		EIS 5	2 byte 9.*	C	R	W	-
		Percent	1 byte 5,001	C	R	W	-
		0..255	1 byte 5,010	C	R	W	-
64	*C9 lock*	*Lock = 1*	1 bit 1.001	C	R	W	-
		Lock = 0	1 bit 1.001	C	R	W	-
65	*C9.1 threshold switch input*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5,010	C	R	-	T
		priority	2 bit 2,001	C	R	-	T
66	*C9.2 threshold switch input*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5,010	C	R	-	T
		priority	2 bit 2,001	C	R	-	T
67-78	Threshold channels C10..C12						
79	*C13 Logic module*	*Logic input 1 in AND/OR/XOR gate*	1 bit 1,001	C	R	W	-
80		*Logic input 2 in AND/OR/XOR gate*	1 bit 1,001	C	R	W	-
81		*Logic input 3 in AND/OR gate*	1 bit 1,001	C	R	W	-
82		*Logic input 4 in AND/OR gate*	1 bit 1,001	C	R	W	-
83	*C13 Logic module*	*Lock = 0*	1 bit 1,001	C	R	W	-
		Lock = 1	1 bit 1,001	C	R	W	-

Continuation:

No.	Object name	Function	Type DPT	Flags			
84	*C13.1 Logic module*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5,010	C	R	-	T
		priority	2 bit 2,001	C	R	-	T
85	*C13.2 Logic module*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5,010	C	R	-	T
		priority	2 bit 2,001	C	R	-	T
86-120	C14..C18, see below						

Table 3: Objects for the switching channels

C1	C2	C3	C4	C5	C6	C7	C8
7	14	21	28	35	42	49	56
8	15	22	29	36	43	50	57
9	16	23	30	37	44	51	58
10	17	24	31	38	45	52	59
11	18	25	32	39	46	53	60
12	19	26	33	40	47	54	61
13	20	27	34	41	48	55	62

Table 4: Objects for the threshold channels

C9	C10	C11	C12
63	67	71	75
64	68	72	76
65	69	73	77
66	70	74	78

Table 5: Objects for the logic channels

C13	C14	C15	C16	C17	C18
79	86	93	100	107	114
80	87	94	101	108	115
81	88	95	102	109	116
82	89	96	103	110	117
83	90	97	104	111	118
84	91	98	105	112	119
85	92	99	106	113	120

3.2.1 Description of objects

3.2.1.1 Time and date

- **Object 0 "***local time***"**

As a transmission object:
Sends the current time in DPT 10.001 format, depending on the configuration: only on request, cyclically or at specific times (see "*Send time and date*" parameter).

As a receive object:
Used to set the time via the bus.

- **Object 1"***Local date***"**

As a transmission object (send date):
Sends the current date in DPT 11.001 format, depending on the configuration: only on request, cyclically or at specific times.

As a receive object (receive date):
Used to set the date via the bus:

- **Object 2"UTC time"**

World time (*Coordinated Universal Time)* i.e. Basis for the calculation of the different time zones.
Corresponds to the time at the Greenwich meridian.

CET (Central European Time) = UTC + 1 h
CEST (Central European Summer Time) = UTC + 2 h.

UTC time is only sent and not received.

- **Object 3 ″UTC date″**

World date corresponds to the date at the Greenwich meridian.

UTC date is only sent and not received.

- **Object 4 ″Time query″**

Table 6

Mode of operation of object, time and date	Data orientation
receive time and date	Object sends time query to bus clock switch to receive the current time.
send time and date	Object receives time query from other bus participants and initiates transmission process for time and date objects.

- **Object 5 "E DCF/GPS module"**

Sends a 1 (after one hour) if the DCF or GPS module is defective or unavailable.
0 = No error.

- **Object 6 "Date / time (DPT 19.001)"**

As a transmission object:
Sends the date and current time together as an 8 byte telegram depending on the configuration: only on request, cyclically or at specific times (see "*Send time and date*" parameter).

As a receive object:
Used to set the time and date via the bus.

3.2.1.2 Switching channels C1..C10

- **Objects 7 "C1.1, switching channel, switching, priority, valuator, per cent, HVAC operating mode, temperature in °C, temperature in K, scene"**

This is the first output object of a switching channel.
The function of the object depends upon the selected telegram type
(see parameter page *switching channel C1*, parameter *telegram type C1.1*).

Table 7

Telegram type	format	Sent telegrams
switching command	DPT 1.001 (On/Off)	On / Off
priority	DPT 2.001 (priority control)	2-bit telegram: <table><tr><td>*Function*</td><td>*value*</td></tr><tr><td>no priority (no control)</td><td>0</td></tr><tr><td>Priority OFF (control: disable, off)</td><td>2</td></tr><tr><td>Priority ON (control: enable, on)</td><td>3</td></tr></table>
value	DPT 5.010	Value between 0 and 255
percentage value	DPT 5.001	Percentage value 0..100%
HVAC operating mode	DPT 20.102	Send HVAC operating mode. <table><tr><td>value</td><td>Operating mode</td></tr><tr><td>1</td><td>comfort</td></tr><tr><td>2</td><td>standby</td></tr><tr><td>3</td><td>Night</td></tr><tr><td>4</td><td>Frost protection/heat protection</td></tr></table>
Temperature [°C]	DPT 9.001	Absolute temperature in °C (0..100 °C)
Temperature differential [K]	DPT 9.002	Relative temperature in K (-50..50 K)
scene	DPT	Scene numbers 1..64

- **Object 8 "C1.2 switching channel, switching, priority, valuator, per cent, HVAC operating mode, temperature in °C, temperature in K"**

This is the second output object of a switching channel
The function of the object depends upon the selected telegram type
(see parameter page *switching channel C1*, parameter *telegram type C1.2*).

The telegram type can be configured independently of the first output object.

Table 8

Telegram type	format	Sent telegrams
switching command	DPT 1.001 (On/Off)	On / Off
value	DPT 5.010	Value between 0 and 255
percentage value	DPT 5.001	Percentage value 0..100%
HVAC operating mode	DPT 20.102	Send HVAC operating mode. <table><tr><td>value</td><td>Operating mode</td></tr><tr><td>1</td><td>comfort</td></tr><tr><td>2</td><td>standby</td></tr><tr><td>3</td><td>Night</td></tr><tr><td>4</td><td>Frost protection/heat protection</td></tr></table>
Temperature [°C]	DPT 9.001	Absolute temperature in °C
Temperature differential [K]	DPT 9.002	Relative temperature in K

The cycle time and the disabling behaviour are apply to both objects (objects 7+8).

- **Object 9 ″Disable C1″**

Only available if the disable function is activated.

The behaviour when setting/cancelling the block and the acting direction can be selected on the *disable function* parameter page.

- **Object 10 "C1 switching channel, special program"**

Each special program can be activated via the object.
The number of the required is sent for this.
The special program is switched off with program number 0 (standard program active).
The switching times of the special programmes have to be created with the Obelisk program.
There are no standard templates.
Special programs have a higher priority than the standard program and the higher the number, the higher priority

0 = End special program/no special program (i.e. standard program).
1-14 = Calls up the corresponding special program.
15 = Special program Continuous ON.
16 = Special program Continuous OFF.

Note: If a special program is activated via the "Menu/program" push button rather than via the object, the object will not be updated *or displayed onscreen.*

- **Object 11 "***Time to next service, operating hours feedback* **"**

Only available if the operating hours counter function is activated
Reports, depending on selected *type of operating hours counter*, either the remaining time to end of set service interval or the current status of the operating hours counter.

- **Object 12 "***Service required***"**

Only available if the operating hours counter function has been activated
and *type of operating hours counter = counter for time to next service.*

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

- **Object 13 "***Reset service, reset operating hours***"**

Only available if the operating hours counter function is activated

Function	Use
Reset service*	Reset service interval counter. 1 = Reset
Reset operating hours*	Reset operating hours counter 1 = Reset

* Depending on configuration.

- **Objects 14..62**

Objects 14 to 62 are for the switching channels C2..C10 and are identical in their function to the objects on channel C1.

3.2.1.3 Threshold switches C9..C12

- **Object 63** *"C9 threshold switch input"*

Channel input object, this object activates the set channel function.

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

- **Object 64** *"C9 disable"*

Channel disable object.
Only visible if the disable function is activated.
The acting direction (disable with 0 or 1) can be set via parameter.

- **Object 65** *"C9.1 threshold switch, switch/valuator/ priority"*

This is the first output object of the threshold switch.
The function of the object depends upon the selected telegram type
(see *Objects* parameter page, *telegram type C9.1* parameter).

Table 9

Telegram type	format	Sent telegrams		
Switching	DPT 1.001 (On/Off)	On / Off		
priority	DPT 2.001 (priority control)	2-bit telegram:		
		Function	*value*	
		no priority (no control)	0	
		Priority OFF (control: disable, off)	2	
		Priority ON (control: enable, on)	3	
value	DPT 5.010	Value between 0 and 255		

- **Object 66** *"C9.2 threshold switch, switching/valuator/priority"*

This is the second output object of the threshold switch.
The function of the object depends upon the selected telegram type
(see *Objects* parameter page, *telegram type C9.2* parameter).

The telegram type can be configured independently of the first output object.
The same setting options are available for this purpose as for the first output object
(see table above for object 65).

The cycle time and the disabling behaviour are apply to both objects (objects 65+66).

- **Objects 67..78**

Objects 67 to 78 are for the switching channels C10/C12 and are identical in their function to the objects on channel C9.

3.2.1.4 Logic modules C13..C18

- **Object 79** *"C13 logic module, logic input 1 in AND/OR/XOR gate"*

First input object of the logic module.

- **Object 80** *"C13 logic module, logic input 2 in AND/OR/XOR gate"*

Second input object of the logic module.

- **Object 81** *"C13 logic module, logic input 3 in AND/OR gate"*

Third input object of the logic module.
Not used with XOR link.

- **Object 82** *"C13 logic module, logic input 4 in AND/OR gate"*

Fourth input object of the logic module.
Not used with XOR link.

- **Object 83** *"C13 logic module, disable"*

Channel disable object.
Only visible if the disable function is activated.
The acting direction (disable with 0 or 1) can be set via parameter.

- **Object 84** *"C13.1 logic module, switch/valuator/priority"*

This is the first output object of the logic module.
The function of the object depends upon the selected telegram type
(see *Objects* parameter page, *telegram type C13.1* parameter).

Table 10

Telegram type	format	Sent telegrams		
Switching	DPT 1.001 (On/Off)	On / Off		
priority	DPT 2.001 (priority control)	2-bit telegram:		
		Function	*value*	
		no priority (no control)	0	
		Priority OFF (control: disable, off)	2	
		Priority ON (control: enable, on)	3	
value	DPT 5.010	Value between 0 and 255		

- **Object 85** *"C13.2 logic module, switch/valuator/priority"*

This is the second output object of the logic module
The function of the object depends upon the selected telegram type
(see *Objects* parameter page, *telegram type C13.2* parameter).

The telegram type can be configured independently of the first output object.
The same setting options are available for this purpose as for the first output object
(see table above for object 84).

The cycle time and the disabling behaviour are apply to both objects (objects 84+85).

- **Objects 86..120**

Objects 86 to 120 are for the logic modules C13/C18 and are identical in their function to the objects on channel C13.

3.3 Parameter

3.3.1 Parameter pages

Table 11

Function	Description
General	Selection of required channels
Date and time	Settings for transmission/reception of time/date and selection of antenna.
Switching channel C1: Function .. Switching channel C10: Function	Telegram type and reaction when clock is switched on and off.
Locking function	Response to disable telegrams
Catch up switching times	Reaction after restoration of bus, changing time, programming of switching times etc.
Threshold channel C9: Function .. Threshold channel C12: Function	Type of threshold value object, delays etc.
Objects	Telegram type, switching and disable response etc.
Logic channel C13: Function .. Logic channel C18: Function	Number of inputs, links etc.
Objects	Telegram type, switching and disable response etc.

3.3.2 Parameter description

Settings that lead to the display of other pages or functions are identified by ...
Example: *yes../no*

3.3.2.1 The "General" parameter page

Table 12

Designation	*Values*	Description
Activate switching channel C1	*No* *Yes..*	
Activate switching channel C2	*No* *Yes..*	
Activate switching channel C3	*No* *Yes..*	
Activate switching channel C4	*No* *Yes..*	
Activate switching channel C5	*No* *Yes..*	The switching channels can issue telegrams when clock is switched on or off.
Activate switching channel C6	*No* *Yes..*	
Activate switching channel C7	*No* *Yes..*	
Activate switching channel C8	*No* *Yes..*	
Activate switching channel C9	*No* *Yes..*	
Activate switching channel C10	*No* *Yes..*	

3.3.2.2 The "Date and time" parameter page

Table 13

Designation	Values	Description
Mode of operation of object, time and date	***send time and date***	If "send' is selected, the clock can send the current time and date to the bus cyclically and on request.
	receive time and date	If "receive" is selected, the clock can be reset via external time and date telegrams.
Parameter for *send time and date*		
send time and date	*on request* *every minute* ***every hour*** *every day at midnight and at summer/winter changeover* *Every day at 00:02 and at summer/winter changeover*	Setting, when for example how often time and date should be sent. Note: Sending can be initiated at anytime via the "time query" object.
Type of antenna	***None*** *GPS* *DCF 77*	The exact time is acquired via an external receiver module.
Parameter for r*eceiving time and date*		
Format of time and date telegrams	*standard (DPT 10.001 + DPT 11.001)*	Time and date received separately at objects 0 and 1.
	data point Date Time (8 Byte, DPT 19.001)	Receive time and date together as an 8 byte telegram on object 6.
Send time request	*Do not send* *every hour* *every 2 hours* *every 3 hours* *every 6 hours* *every 12 hours*	If GPS or DCF modules are not used: How often should a time query be sent to the bus?

3.3.2.3 The parameter pages "switching channel C1..C10: Function"

The switching channels are activated on the general parameter page.
Different parameters are available according to the set functions.

Table 14

Designation	Values	Description
Telegram type C1.1	***Switching command***	1 bit ON/OFF
	Priority	2-bit
		<table><tr><td>Function</td><td>value</td></tr><tr><td>Priority inactive (no control)</td><td>0 (00bin)</td></tr><tr><td>Priority ON (control: enable, on)</td><td>3 (11bin)</td></tr><tr><td>Priority OFF (control: disable, off)</td><td>2 (10bin)</td></tr></table>
	value	Value between 0 and 255
	percentage value	Percentage value 0..100%
	HVAC operating mode	Send HVAC operating mode. <table><tr><td>value</td><td>Operating mode</td></tr><tr><td>1</td><td>comfort</td></tr><tr><td>2</td><td>standby</td></tr><tr><td>3</td><td>Night</td></tr><tr><td>4</td><td>Frost protection/heat protection</td></tr></table>
	Temperature (°C)	Absolute temperature in °C (0..100)
	Temperature differential [K]	Relative temperature in K (-50..50)
	scene	Scene numbers 1..64
With clock → ON	*no telegram* ***send following telegram once*** *send cyclically*	Transmission response when the channel is switched on.

Continuation:

Designation	Values	Description
Telegram		Type of telegram for the first output with channel switched on
	ON	For telegram type *Switching command*.
	OFF	
	no priority	For telegram type *Priority*.
	priority, ON (down)	
	priority, OFF (up)	
	*Telegram 0 .. **255***	For telegram type *Value*.
	*0..**100***	For telegram type *Percentage value*
	comfort	For telegram type *HVAC operating*
	Standby	*mode*
	temperature reduction at night	
	frost and heat protection modes	
	0..100	For telegram type *Temperature (°C)*
	-50..50	For telegram type *Temperature differential (K)*
	1..64	For telegram type Scene
As with clock → OFF	*no telegram*	Transmission response if the channel is switched off.
	send following telegram once	
	send cyclically	

Continuation:

Designation	Values	Description
Telegram		Type of telegram for the first output object with channel switched off.
	ON *OFF*	For telegram type *Switching command.*
	no priority ***priority, ON (down)*** *priority, OFF (up)*	For telegram type *Priority.*
	Telegram 0 .. ***255***	For telegram type *Value.*
	*0..****100***	For telegram type *Percentage value*
	comfort *Standby* *temperature reduction at night* *frost and heat protection modes*	For telegram type *HVAC operating mode*
	0..100	For telegram type *Temperature (°C)*
	-50..50	For telegram type *Temperature differential (K)*
	1..64	For telegram type Scene
Should a second telegram be sent?	*Yes* ***no***	If yes is selected, further parameters and a second transmission object appear. It can be used to send 2 different telegrams at the same time on the same channel. The cycle time and the disabling behaviour apply to both objects.

Continuation:

Designation	Values	Description
Telegram type C1.2	*switching command*	1 bit ON/OFF
	value	Value between 0 and 255
	percentage value	Percentage value 0..100%
	HVAC operating mode	Send HVAC operating mode.
		<table><tr><td>value</td><td>Operating mode</td></tr><tr><td>1</td><td>comfort</td></tr><tr><td>2</td><td>standby</td></tr><tr><td>3</td><td>Night</td></tr><tr><td>4</td><td>Frost protection/heat protection</td></tr></table>
	Temperature (°C)	Absolute temperature in °C
	Temperature differential [K]	Relative temperature in K
With clock → ON	*no telegram*	Transmission response when the channel is switched on.
	send following telegram once	
	send cyclically	
Telegram		Type of telegram for the second output with channel switched on.
	ON	For telegram type Switching command.
	OFF	
	Telegram 0 .. 255	For telegram type Value.
	0..100	For telegram type Percentage value
	comfort	For telegram type HVAC operating
	Standby	mode
	temperature reduction at night	
	frost and heat protection modes	
	0..100	For telegram type Temperature (°C)
	-50..50	Temperature differential [K]
As with clock → OFF	*no telegram*	Transmission response if the channel is switched off.
	send following telegram once	
	send cyclically	

Continuation:

Designation	Values	Description
Telegram		Type of telegram for the second output object with channel switched off
	ON	For telegram type Switching command.
	OFF	
	Telegram 0 .. 255	For telegram type Value.
	0..100	For telegram type Percentage value
	comfort *Standby* *temperature reduction at night* *frost and heat protection modes*	For telegram type HVAC operating mode
	0..100	For telegram type Temperature (°C)
	-50..50	Temperature differential [K]
Activate lock function	*Yes*	Insert disable parameter and disable object.
	no	No disable function.
Activate operating hours counter	***no*** *yes..*	Is the *operating hours counter/ service interval* function to be used?
Cycle time (if used)	*every min* *every 2 min* *every 3 min* *every 5 min* *every 10 min* *every 15 min* *every 20 min* *every 30 min* *every 45 min* ***every 60 min***	How often should the telegrams for CX.1 and CX.2 be sent?

3.3.2.4 Parameter pages "Disable function"

The disable function is activated on the switching channel C1 parameter page.
Different parameters are available according to the set functions.

Table 15

Designation	Values	Description
Lock telegram	***Disable with ON telegram***	1 = Disable
		0 = Cancel disable
	lock with OFF telegram	1 = Cancel disable
		0 = Disable*
Response when setting disable	***do not send***	No telegrams when setting disable
	as with clock → ON	Same reaction set as with parameter for clock → ON (see above, *the parameter pages "switching channel C1..C10: Function"*).
	as with clock → OFF	Same reaction set as with parameter *for clock → OFF* (see above, *the parameter pages "switching channel C1..C10: Function"*).
Behaviour when cancelling the disable function	*do not send*	Not automatically resent when the disable function is cancelled
	update channel	The current channel status is sent immediately as soon as the disable function is cancelled

*After reset/download: Disable function only active after the disable object has received a 0.

3.3.2.5 The "*Operating hours counter and service* parameter page"

This page appears when *Activate operating hours counter* is selected on the *Switching channel Cx* parameter page.

Table 16

Designation	Values	Description
Type of operating hours counter	***operating hours counter***	Forward counter for channel power-on time.
	counter for time period before next service	Backward counter for channel power-on time.
operating hours counter		
Reporting of changes to operating hours (0..100 h, 0 = no report)	*0..100* *Default value = 10*	At what interval is the current counter status to be sent? Example: 10 = Send each time the counter status increases by another 10 hours.
Report operating hours cyclically	*No* *yes*	Send at regular intervals?
Time for cyclical transmission	*2 minutes, 3 minutes,* *5 minutes, 10 minutes,* *15 minutes, 20 minutes,* *30 minutes, 45 minutes* ***60 minutes***	At what interval?
counter for time period before next service		
Service interval (1..32767)	*1.. 32767* *Default value = 100*	Desired timescale in hours between two services.
Reporting of changes to time to service (0..100 h, 0 = no report)	*0..100* *Default value = 10*	At what interval is the current counter status to be sent? Example: 10 = Send each time the counter status decreases by another 10 hours.
Report time to service cyclically	*no* *Yes*	Send **remaining** time to next service at regular intervals? → Object *Time to next service*.
Report service cyclically	*no* *Yes*	**Required service** (1 bit) send at regular intervals? → Object *Service required*.
Tine for cyclical transmission (time to service and service	*2 minutes, 3 minutes,* *5 minutes, 10 minutes,* *15 minutes, 20 minutes,* *30 minutes, 45 minutes* ***60 minutes***	At what interval?

3.3.2.6 Parameter pages "Catch up switching times"

This determines whether the current channel status should be resent (telegram repeat) after certain events, (bus restoration, changes to the program memory etc.).
Resending the current channel status is generally worthwhile but may not be required in certain applications.

Table 17

Designation	Values	Description
Resend last time command:		
After download	no	After downloading application program: do not send current channel status
	Yes	always send the current channel status
After restoration of bus supply		This applies to the following events: • KNX reset. • Return of bus voltage
	yes	The current channel status should not always be sent after bus restoration.
	no	Do not send if one of these events occurs.

Continuation:

Designation	Values	Description
After changing the time		This applies to the following events: • Time/date are adjusted via objects • Time/date are adjusted via DCF or GPS time • Time is adjusted on the menu • Date is adjusted on the menu • Easter function was changed • Summer/winter time changeover • Summer/winter rule has been selected • Own summer/winter rule changed • Time zone has been changed • Coordinates with time zone have been changed
	no	Do not send if one of these events occurs.
	Yes	Always send if one of these events occurs.
	only with status change	Only send channel status if it has been changed by one of these events.
After programming/deleting a time command		This applies to the following events: • All programs on the channel are deleted • One program has been deleted • One program has been changed • All the programs on all the channels have been deleted • Holidays have been manually deleted • Holidays have been reentered
	no	Do not send if one of these events occurs.
	Yes	Always send if one of these events occurs.
	only with status change	Only send channel status if it has been changed by one of these events.

Continuation:

Designation	Values	Description
After changing a special program		This applies to the following events: • a special program has been started via an object • a special program has been started manually • a special program has been changed manually
	no	Do not send if one of these events occurs.
	Yes	Always send if one of these events occurs.
	only with status change	Only send channel status if it has been changed by one of these events.

3.3.2.7 Parameter pages "*Threshold channel C9..C12*"

The threshold channel block forms a separate unit that is completely independent of the switching times.

Principle:
A value is received from the bus and compared with the set threshold.
The condition is fulfilled if the value is higher than the set threshold.
In turn, not fulfilled if the value is below it.

The response of the output objects to fulfilling/not fulfilling the condition is set on the *Objects* parameter page.

The channel status (condition fulfilled/unfulfilled) for each threshold channel can also be configured as input value for logic channels (see below, The logic channels).

The switching channels are activated on the *General* parameter page.

Table 18

Designation	Values	Description
Type of threshold value object	***object type: Per cent (DPT 5.001)*** *Object type: Counter value 0..255 (DPT 5.010)* *Object type: Counter value 0..65535 (DPT 7.001)* *Object type: EIS5 e.g. CO2, brightness, etc. (DPT 9.xxx)*	Value type for threshold.
Parameter for *Percent* threshold object		
Threshold value (in %)	*1..99* Default = **50**	Desired threshold value as percentage.
Hysteresis (as %)	*1..99* Default = **5**	Prevents frequent switching after small changes in readings. The hysteresis is uniformly negative for all threshold types, e.g. threshold 50, hysteresis 5 means: Switch on at 50 a switch off at 50 – hysteresis = 45
Parameter for threshold value object *Counter value 0..255*		
Threshold value	*1..254* Default = **127**	Desired threshold value as 1 byte number from 1 to 254.
Hysteresis	*1..254* Default = **5**	The hysteresis prevents frequent switching after small changes in readings.

Continuation:

Designation	Values	Description
Parameter for threshold value object Counter value 0..65535		
Threshold value	*1..65534* Default = *1000*	Desired threshold value as 2 byte number from 1 to 65534.
Hysteresis	*1..65534* Default = *5*	The hysteresis prevents frequent switching after small changes in readings.
Parameter for threshold value object EIS5 (e.g. CO$_2$, brightness…)		
Threshold value format: *(-000.00..9999)*	*-9999..99999* Default = *20.0*	Desired threshold value as decimal number with prefix. Format: A maximum of 5 characters are permitted including decimal point and prefix. Examples with five characters: -9999 -9.99 10.35 100.6 99999 etc.
Hysteresis format: *0.00..9999*	*0.00..9999* Default = *1.0*	The hysteresis prevents frequent switching after small changes in readings. Format: Max. 4 characters, positive numbers only. Examples: 0.01 99.9 9999
Common parameters		
Delay with exceeding	***None,*** *5 s, 10 s, 20 s, 30 s, 1 min, 2 min, 3 min, 5 min, 10 min, 15 min, 20 min*	The channel sends immediately. The channel only sends after set delay is completed.
Delay with falling below	***none*** *5 s, 10 s, 20 s, 30 s, 1 min, 2 min, 3 min, 5 min, 10 min, 15 min, 20 min*	The channel sends immediately. The channel only sends after set delay is completed.

3.3.2.8 Parameter pages "*Objects*"

The response to falling below or exceeding the set threshold is configured here.

Table 19

Designation	Values	Description
Telegram type C9.1	***Switching command***	1 bit ON/OFF
	Priority	2-bit <table><tr><td>Function</td><td>value</td></tr><tr><td>Priority inactive (no control)</td><td>0 (00_{bin})</td></tr><tr><td>Priority ON (control: enable, on)</td><td>3 (11_{bin})</td></tr><tr><td>Priority OFF (control: disable, off)</td><td>2 (10_{bin})</td></tr></table>
	value	1-byte 0 .. 255
When exceeding the threshold	*no telegram* ***send following telegram once*** *send cyclically*	Send response if channel condition is fulfilled.
Telegram		Type of telegram for the first output object on the channel with fulfilled condition:
	ON *OFF*	For telegram type Switching command.
	no priority ***priority, ON (down)*** *priority, OFF (up)*	For telegram type Priority.
	*Telegram 0 .. **255***	For telegram type Value.
When underrunning threshold	*no telegram* ***send following telegram once*** *send cyclically*	Send response if channel condition is unfulfilled.
Telegram		Type of telegram for the first output object on the channel with unfulfilled condition:
	ON ***OFF***	For telegram type Switching command.
	no priority *priority, ON (down)* ***priority, OFF (up)***	For telegram type Priority.
	*Telegram **0** .. 255*	For telegram type Value.

Continuation:

Designation	Values	Description
Should a second telegram be sent?	*Yes* ***no***	If yes is selected, further parameters and a second transmission object appear. It can be used to send 2 different telegrams at the same time on the same channel. The cycle time and the disabling behaviour apply to both objects.
Telegram type C9.2	***Switching command*** *Priority* *value*	Second output object on channel 1 bit ON/OFF 2-bit Function | value Priority inactive (no control) | 0 (00_{bin}) Priority ON (control: enable, on) | 3 (11_{bin}) Priority OFF (control: disable, off) | 2 (10_{bin}) 1-byte 0 .. 255
When exceeding the threshold	*no telegram* ***send following telegram once*** *send cyclically*	Send response if channel condition is fulfilled.
Telegram	***ON*** *OFF* *no priority* ***priority, ON (down)*** *priority, OFF (up)* *Telegram 0 .. **255***	Type of telegram for the second output object on the channel with fulfilled condition: For telegram type Switching command. For telegram type Priority. For telegram type Value.
When underrunning threshold	*no telegram* ***send following telegram once*** *send cyclically*	Send response if channel condition is unfulfilled.
Telegram	*ON* ***OFF*** *no priority* *priority, ON (down)* ***priority, OFF (up)*** *Telegram **0** .. 255*	Type of telegram for the second output object on the channel with unfulfilled condition: For telegram type Switching command. For telegram type Priority. For telegram type Value.

Continuation:

Designation	Values	Description
Activate lock function	*Yes*	Insert disable parameter and disable object.
	no	No disable function.
Lock telegram	**Disable with ON telegram**	1 = Disable 0 = Cancel disable
	lock with OFF telegram	1 = Cancel disable 0 = Disable*
Response when setting disable	**do not send**	No telegrams when setting disable
	as with unfulfilled condition	Same reaction set as with parameter *If below threshold* (see above).
	as with fulfilled condition	Same reaction set as with parameter *When exceeding threshold* (see above).
Behaviour when cancelling the disable function	*Do not send*	Not automatically resent when the disable function is cancelled
	update channel	The current channel status is sent immediately as soon as the disable function is cancelled
Cycle time (if used)	*every min* *every 2 min* *every 3 min* *every 5 min* *every 10 min* *every 15 min* *every 20 min* *every 30 min* *every 45 min* **every 60 min**	How often should the telegrams for CX.1 and CX.2 be sent?

3.3.2.9 Parameter pages "*Logic channel C13..C18*"

The logic channel block forms a separate unit that is initially completely independent of the switching times, but they can be included if necessary.
The logic channels can thus be used for a broad range of tasks in the KNX device.
The logic channels are activated on the general parameter page.

Principle:
Up to four 1 bit input values can be logically linked to each other.

These input values can be:
- Input objects
- Status of switching channels (On / Off)
- Status of threshold channels (fulfilled/unfulfilled)
- Link result of other logic channels (a logic channel cannot be connected with itself)

IMPORTANT:
Activated channels only should be used as input values (parameter page *General*).

The response of the output objects to fulfilling/not fulfilling the condition is set on the *Objects* parameter page.

Table 20

Designation	Values	Description
Type of link		Selection of logical link between 1-bit input values (see below)
	AND	2 to 4 inputs
	OR	2 to 4 inputs
	XOR	2 inputs
Use input 1	**Yes**	Input is used.
	Yes, inverted	Input appears inverted.
Use input 2	**Yes**	See above, input 1
	Yes, inverted	
Use input 3	**No**	Input is hidden.
	Yes	See above.
	Yes, inverted	
Use input 4	**No**	Input is hidden.
	Yes	See above.
	Yes, inverted	
Input value for input 1	*Input object*	First input object on channel (e.g. object 79 for C13)
	Status C1 Status C2 Status C3 Status C4 Status C5 Status C6 Status C7 Status C8	Status of switching channel (On/Off).
	Status threshold channel C9 Status threshold channel C10 Status threshold channel C11 Status threshold channel C12	Status of threshold channel (threshold exceeded/not exceeded).
	Link result logic channel C13$^{(1)}$ Link result logic channel C14$^{(2)}$ Link result logic channel C15$^{3)}$ Link result logic channel C16$^{(4)}$ Link result logic channel C17$^{(5)}$ Link result logic channel C18$^{(6)}$	Link result of another logic channel (a logic channel cannot be connected with itself)
Input value for input 2	*See above, Input value for input 1*	Second input object on channel See above.

Continuation:

Designation	Values	Description
Input value for input 3	*See above,* *Input value for input 1*	Third input object on channel See above.
Input value for input 4	*See above,* *Input value for input 1*	Fourth input object on channel See above.

[1] If C13 unavailable , [2] If C14 unavailable, [3] If C15 unavailable
[4] If C16 unavailable , [5] If C17 unavailable, [6] If C18 unavailable

3.3.2.10   Parameter pages "*Objects*"

The reaction to fulfilling or not fulfilling the link is configured here.

Table 21

Designation	Values	Description		
Telegram type C13.1	***Switching command***	1 bit ON/OFF		
	Priority	2-bit		
		Function	value	
		Priority inactive (no control)	$0\ (00_{bin})$	
		Priority ON (control: enable, on)	$3\ (11_{bin})$	
		Priority OFF (control: disable, off)	$2\ (10_{bin})$	
	value	1-byte 0 .. 255		
If the condition is met	*no telegram* ***send following telegram once*** *send cyclically*	Send response if channel condition is fulfilled, i.e. link result = 1.		
Telegram		Type of telegram for the first output object on the channel with fulfilled condition:		
	ON *OFF*	For telegram type Switching command.		
	no priority ***priority, ON (down)*** *priority, OFF (up)*	For telegram type Priority.		
	Telegram 0 .. ***255***	For telegram type Value.		
If the condition is not met	*no telegram* ***send following telegram once*** *send cyclically*	Send response if channel condition is not fulfilled, i.e. link result = 0.		
Telegram		Type of telegram for the first output object on the channel with unfulfilled condition:		
	ON ***OFF***	For telegram type Switching command.		
	no priority *priority, ON (down)* ***priority, OFF (up)***	For telegram type Priority.		
	Telegram ***0*** *.. 255*	For telegram type Value.		

Continuation:

Designation	Values	Description
Should a second telegram be sent?	*Yes* ***no***	If yes is selected, further parameters and a second transmission object appear. It can be used to send 2 different telegrams at the same time on the same channel. The cycle time and the disabling behaviour apply to both objects.
Telegram type C13.2	***Switching command*** *Priority* *value*	Second output object on channel 1 bit ON/OFF 2-bit | Function	value
---	---
Priority inactive (no control)	0 (00_{bin})
Priority ON (control: enable, on)	3 (11_{bin})
Priority OFF (control: disable, off)	2 (10_{bin})	 1-byte 0 .. 255
If the condition is met	*no telegram* ***send following telegram once*** *send cyclically*	Send response if channel condition is fulfilled.
Telegram	 ***ON*** *OFF* *no priority* ***priority, ON (down)*** *priority, OFF (up)* *Telegram 0 .. 255*	Type of telegram for the second output object on the channel with fulfilled condition: For telegram type Switching command. For telegram type Priority. For telegram type Value.
If the condition is not met	*no telegram* ***send following telegram once*** *send cyclically*	Send response if channel condition is unfulfilled.
Telegram	 *ON* ***OFF*** *no priority* *priority, ON (down)* ***priority, OFF (up)*** *Telegram 0 .. 255*	Type of telegram for the second output object on the channel with unfulfilled condition: For telegram type Switching command. For telegram type Priority. For telegram type Value.

Continuation:

| Designation	Values	Description
Activate lock function	*Yes*	Insert disable parameter and disable object.
	no	No disable function.
Lock telegram	***Disable with ON telegram***	1 = Disable 0 = Cancel disable
	lock with OFF telegram	1 = Cancel disable 0 = Disable*
Response when setting disable	***do not send***	No telegrams when setting disable
	as with unfulfilled condition	Same reaction set as in parameter *If the conditioned has not been fulfilled* (see above).
	as with fulfilled condition	Same reaction set as in parameter *If the conditioned has been fulfilled* (see above).
Behaviour when cancelling the disable function	*Do not send*	Not automatically resent when the disable function is cancelled
	update channel	The current channel status is sent immediately as soon as the disable function is cancelled
Cycle time (if used)	*every min* *every 2 min* *every 3 min* *every 5 min* *every 10 min* *every 15 min* *every 20 min* *every 30 min* *every 45 min* ***every 60 min***	How often should the telegrams for CX.1 and CX.2 be sent?

4 Appendix

4.1 Program switching times via the KNX bus

Obelisk PC software can be used to program and read out switching programs (and Astro programs) via the KNX bus.

The PC (via a KNX interface) has to be connected to the KNX device and additional required software components have to be installed (see below).

4.1.1 Configuration

The configuration of the interface and the input of the clock's physical address are completed on the menu - File/KNX/Settings.
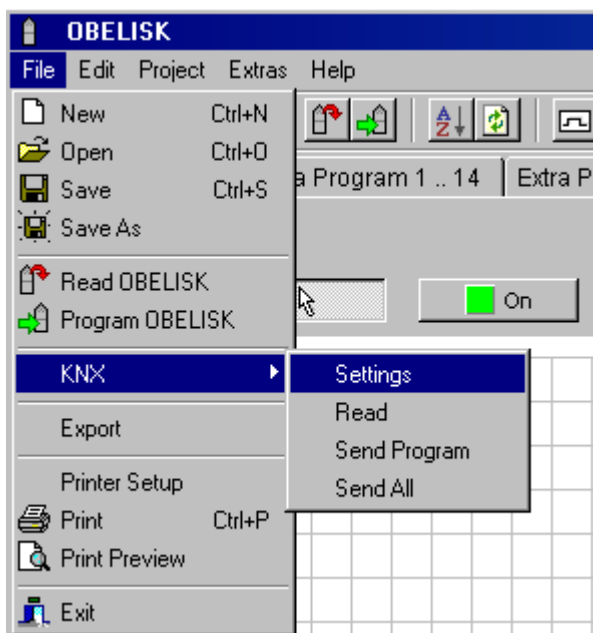
Important:
If the application software is deactivated via the ETS (→Unload) or has not been downloaded. (→First use) programming via OBELISK software is not possible.

4.1.2 Data exchange

Data can be exchanged with the clock via the KNX menu item.

Menu item	Description
Read	This reads the switching program (all standard and special programs) and all settings (e.g. position, offset, external input, time format etc.) from the clock switch switch to the Obelisk software. **Note:** The reading process can take a while. (≥ 10 min.).
Send program	Copies the switching program (all standard and special programs) from the Obelisk software to the clock switch switch.
Send all	Copies the switching program (all standard and special programs) and all clock switch switch settings (e.g. Position, offset, external input, time format etc.) from the Obelisk software to the clock switch switch.

4.1.3 Requirements for KNX program transmission

For bus communication, the Falcon driver (*FalconRuntime_V20_ObeliskKNX.msi*) must be installed.
This program is installed on the Obelisk CD in the "Driver" directory.

> ➢ **Windows 7 and Vista**

No further software required.

> ➢ **Windows XP**

The mandatory requirement for the Falcon driver installation under Windows XP is an existing **Microsoft .NET Framework 2.0 SP2*** or **.NET Framework 3.5 SP1** (see Settings → System control → Software).

Otherwise, Version 3.5 Service Pack 1 is to be installed (see below).
Version 4 and higher are not suitable.

4.1.3.1 Download Links

.NET Framework 3.5 Service Pack 1 Download (Internet Setup English 2.8 MB):
http://www.microsoft.com/en-us/download/details.aspx?id=22

Please read the **instructions** on the aforementioned websites carefully.
The installation file (231 MB) is also available there as a **complete package**.

*.NET Framework 2.0 SP2 is automatically installed with ETS 4.

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