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Part 4



The time switch annual DCF EIB is a serial unit for installation in distribution systems. A bus connector terminal is used to create the link with the EIB. The time switch annual DCF EIB offers: 324 captive switching times for selectable day, week and date commands, impulse commands, priority switching times and 1 x switch settings for holidays and vacation days. In addition to the normal weekly program, 9 further week programs with priority levels P1 to P9 and a permanent setting for a period that can be restricted can also be programmed for every channel. A random program can also be activated

The period for a priority program is defined by inputting a start and end date.

## Database structure:



#### Gebr. Berker

- **I** Timer
- Time switch
- Time switch 4gang RMD DCF

#### **Application summary:**

- Scene with switching, value transmitter, forced guidance
- Switching, value transmitter, temperature, time and date reception
- Switching, value transmitter, time and date reception

## **Technical Data**

Number of channels: 4

Memory areas: 324 captured with EEPROM

Automatic program: Daily, weekly, annual and impulse-driven program

Custom program:

• Nine further weekly programs can be entered

 Nine further weekly programs can be entered in addition to the standard weekly program for every channel. These weekly programs can be called up by entering the start and end dates.

Example: Weekly program No. 5 from 24.12 – 6.1.

 Date switching commands and 1 x date switching command can augment every weekly program

 The switching program can be phased out by entering the start and end date by using forced guidance (priority) ON and OFF commands.

Optional activation of a random program.

Manual possibilities for intervention:

Temporary manual switching

Permanent manual switching

**Inputs:** 1 x DCF 77 for antennae

Programming Using 10 key keypad or Obelisk PC program and Obelisk memory card

Minimum time between switching operations:

1 second

Switching precision: 1 second

Formation of blocks: Free block formation of weekdays and channels

Switching from summer to

winter time:

Automatically or using DCF 77 radio signal

Voltage supply: Via bus voltage

Power consumption: approx. 4 mA + BCU

Accuracy: 1 sec/ day or radio-controlled

Accuracy.

**Power reserve:** > 1.5 years through environmentally friendly lithium cell

Permitted ambient -5°C to +45°C

temperature:

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Safety class: IP 20
Assembly: on DIN rail

**Housing dimensions:**  $45 \times 105 \times 60 \text{ mm (H/W/D)}$ 

REG width 6 TE

Accessories DCF receiver 75900047

Obelisk programming set 75900048 Obelisk board 75900049

#### Special features of the time switch 4gang RMD:

When programming the switching time, it is not necessary to have ON and OFF commands follow each other in succession as in the past. For example, a lot of similar switching commands can follow each other in succession.

### **Functional properties**

#### **Priority program**

The programming of a priority program consists of the following:

- 1. Entering the switching times
- 2. Establishing the start and end date

If the time for several priority programs overlaps, then the program with the highest index is always active. For example, the weekly program P2 has priority over the weekly program P1.

### Random program

A random program causes one or more pairs of contacts (ON and OFF switching time) to switch ON or OFF at random within the period of 10 to 120 minutes. The random program can be activated manually via the keypad for every channel.

## Function "1x"

Function "1x" can be used for date-related switching times and for priority times. Following the execution of the date-related switching time, this is independently deleted in the clock at midnight. By the same token, a priority time is deleted after the processing time if it has been configured with the function "1x". However, the corresponding switching times belonging to the priority time are retained in the clock.

Function "1x" can therefore be used sensibly for programming the timer programs for vacation or holiday programs and for moveable holiday programs.

#### Time synchronisation

Time synchronisation in the timer can be handled either by the DCF 77 – radio signal (antennae and power supply required), via the bus by receiving a date and time telegram or can be quartz-controlled automatically.

## Programming the switching time programs

The entire programming of the switching times can be done directly on the unit via the keypad or via the <u>Obelisk PC programming set</u>. The software operates under WINDOWS 3.X. WINDOWS 95 and WINDOWS 2000. Entering the various switching times is performed guickly by clicking the mouse.

The EEPROM memory module (OBELISK), which is loaded onto the PC at an interface and which is subsequently plugged into the contact making clock and loaded transfers the program. It also facilitates fast copying of a switching program.

The Obelisk software Obelisk allows the following, e.g.:

- Programming switching time programs in a EEPROM memory module
- Read out switching time programs from the EEPROM memory module
- · Archiving of the switching time programs on the PC's hard disk
- Printing out switching time programs in table form
- Copying parts of an existing switching time program and adding them into a new or previously existing program

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Defining a new rule for summer/winter time (if no DCF antennae is connected)

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### Short description of application programs:

Application	Function	
Scene with switching, value transmitter, forced guidance	A choice of the following telegram types can be made on each of the 4 channels:  Switch telegram (1 Bit) Forced guidance (priority) telegram (2 Bit) Dimming or value telegram (8 Bit) Optional cyclic transmission  Up to 4 different telegram types can be implement with the 4 <sup>th</sup> channel. As result, various types of actuators or actuator groups (switch / dim / shutter actuators) can be addressed simultaneously at one switching time.	
Switching, value transmitter, time and date transmission	A choice of the following telegram types can be made on each of the 4 channels:  Switch telegram (1 Bit)  Forced guidance (priority) telegram (2 Bit)  Dimming or value telegram (8 Bit)  Optional cyclic transmission  Date and time can be sent every minute, every hour, every day or on request (via Object Request time)	
Switching, value transmitter, temperature, time and date reception	A choice of the following telegram types can be made on each of the 4 channels:  Switch telegram (1 Bit) Forced guidance (priority) telegram (2 Bit) Dimming or value telegram (8 Bit) Temperature telegram (16 Bit) Random telegram in EIS 5 format (16 Bit) Optional cyclic transmission Clock can be synchronised/set via the bus by receiving a time and date telegram	

#### Description of application programm: Switching, value transmitter, forced guidance

### **Functional properties**

Between 1 and 3 switching, forced guidance (priority) or value telegrams can be sent on every channel. In addition, a light scene with up to 4 random telegram types are possible on channel 4. As a result, various types of actuators or actuator groups can be addressed at any one switching time (switch actuators, dim actuators, shutter actuators). Example: The "evening" light scene simultaneously executes the following commands with various group addresses:

- Light off
- Lower heating
- Close shutter
- Enable alarm system

In addition, it is also possible to suppress the clock's time switching program via the bus by addressing one of the blocking objects.

The parameters can be used to set whether the blocking object has an influence on the send responses of the individual channel object. If this is so, then the optional setting of a blocking object for each channel object will trigger a telegram according to the clock's OFF command, the clock's ON command or the triggering of no telegram. No further telegram will be sent subsequently from the corresponding channel object. If the blocking object is reset, then the current status of the channel object will be sent to the bus immediately.

#### Caution!

Communication between the bus coupling unit and timer (and also the execution of the application program) only occurs when the clock is in automatic mode. Possible actions while the clock is not in automatic mode are caught up automatic mode is restored.

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## Communications objects:

Obj.	Name	Function	Туре	Response
0	Input 1	Switching	1 Bit	Send
0	Input 1	Value transmitter	8 Bit	Send
0	Input 1	Forced guidance	2 Bit	Send
1	Input 2	Switching	1 Bit	Send
1	Input 2	Value transmitter	8 Bit	Send
1	Input 2	Forced guidance	2 Bit	Send
2	Input 3	Switching	1 Bit	Send
2	Input 3	Value transmitter	8 Bit	Send
2	Input 3	Forced guidance	2 Bit	Send
3	Input 4 - scene object 1	Switching	1 Bit	Send
3	Input 4 - scene object 1	Value transmitter	8 Bit	Send
3	Input 4 - scene object 1	Forced guidance	2 Bit	Send
4	Input 4 - scene object 2	Switching	1 Bit	Send
4	Input 4 - scene object 2	Value transmitter	8 Bit	Send
4	Input 4 - scene object 2	Forced guidance	2 Bit	Send
5	Input 4 - scene object 3	Switching	1 Bit	Send
5	Input 4 - scene object 3	Value transmitter	8 Bit	Send
5	Input 4 - scene object 3	Forced guidance	2 Bit	Send
6	Input 4 - scene object 4	Switching	1 Bit	Send
6	Input 4 - scene object 4	Value transmitter	8 Bit	Send
6	Input 4 - scene object 4	Forced guidance	2 Bit	Send
7	Locking	Lock telegram reception	1 Bit	Send

Max. number of communication objects: 8
Max. number of group addresses: 10
Max. number of assignments: 10

## Parameter description:

General		
Time for all cyclic sending objects	approx. 2,5 min approx. 3 min. approx. 5 min. approx. 10 min. approx. 15 min. approx. 20 min. approx. 30 min. approx. 45 min. approx. 45 min. approx. 60 min.	Setting for the cycle time used to repeat sending the telegram to the bus. This parameter applies for all objects for which the send response "Cyclic transmission" is set.
Scene function with input 4?	NO YES	Setting concerning whether an light scene function is to be performed on Channel 4
Number of scene objects	2 objects 3 objects 4 objects	Parameter appears when an light scene is to be controlled on Channel 4. Setting concerning how many light scenes are to be generated for Channel 4. When Channel 4 switches ON, telegrams are simultaneously sent to the light scene objects.

## Parameters for the input function: Switching

Input x - scene object y		
Function	Switching Value transmitter Forced guidance	Setting governing whether a switching (1 bit), value transmitter(8 bit) or forced guidance telegram (2 bit) needs to be sent via the channel.
Transmission at command of clock	Clock ON->ON, clock OFF->OFF Clock ON->OFF, clock OFF->ON	Setting governing which telegram (ON or OFF) has to be sent after clock transmits a command (ON or OFF).

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Cyclic transmission ?	NO YES	Setting governs whether the telegram is only sent to the bus when clock channel makes contact or cyclically.
Lock function ?	NO YES	Setting governs whether the send object should ignore the receiving of a blocking telegram ("1" telegram to object "Lock telgram received") or not.
Command at beginning of lock function	Send no telegram Send telegram	Setting governs the send response if the blocking telegram is to be observed.

### Parameters for the input function: Value transmitter

Input x - scene object y		
Function	Switching Value transmitter Forced guidance	Setting governing whether a switching (1 bit), value transmitter(8 bit) or forced guidance telegram (2 bit) needs to be sent via the channel.
Transmission at OFF command of clock	<b>0</b> 255	Setting governing which value telegram has to be sent after clock transmits OFF telegram.
Transmission at ON command of clock	0 <b>255</b>	Setting governing which value telegram has to be sent after clock transmits ON telegram.
Cyclic transmission ?	NO YES	Setting governs whether the telegram is only sent to the bus when clock channel makes contact or cyclically.
Lock function ?	NO YES	Setting governs whether the send object should ignore the receiving of a blocking telegram ("1" telegram to object "Lock telegram received") or not.
Command at beginning of lock function	Send no telegram Send telegram	Setting governs the send response if the blocking telegram is to be observed.

## Parameters for the input function: Forced guidance

Input x - scene object y		
Function	Switching Value transmitter Forced guidance	Setting governing whether a switching (1 bit), value transmitter(8 bit) or forced guidance telegram (2 bit) needs to be sent via the channel.
Forced guidance at OFF command of clock	Forced guidance inactive Forced guidance ON Forced guidance OFF	Setting governing whether a telegram or no telegram has to be sent after clock transmits OFF telegram.
Forced guidance at ON command of clock	Forced guidance inactive Forced guidance ON Forced guidance OFF	This parameter appears if a switch telegram is to be sent. Setting governs whether a forced guidance telegram will be sent when the clock transmits ON telegram.
Cyclic transmission ?	NO YES	Setting governs whether the telegram is only sent to the bus when clock channel switches ON or cyclically.
Lock function ?	NO YES	Setting governs whether the send object should ignore the receiving of a blocking telegram ("1" telegram to object "Lock telegram received") or not.
Command at beginning of lock function	Send no telegram Send telegram	Setting governs the send response if the blocking telegram is to be observed.

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### Description of application programm: Switching, value transmitter, time and date transmission

#### **Functional properties**

A choice can be made between one of the following telegram types on each of the 4 channels:

- Switching telegram (1-Bit)
- Forced guidance (priority) telegram (2-Bit)
- Dimming or value telegram (8-Bit)

Cyclic transmission can be selected for each channel, but a common timer controls this.

The date and time can be sent every minute, every hour or only on request. The status of the request telegram does not matter in the case of a time request via the object Time request (1 bit). The date and time are always transmitted together.

#### Please note:

Communication between the bus coupling unit and the time switch (and consequently the execution of the application program) only occurs if the time switchis in automatic mode (**Auto** display).

## **Communications objects:**

Obj.	Name	Function	Туре	Response
0	Input 1	Switching	1 Bit	Send
0	Input 1	Value transmitter	8 Bit	Send
0	Input 1	Forced guidance	2 Bit	Send
1	Input 2	Switching	1 Bit	Send
1	Input 2	Value transmitter	8 Bit	Send
1	Input 2	Forced guidance	2 Bit	Send
2	Input 3	Switching	1 Bit	Send
2	Input 3	Value transmitter	8 Bit	Send
2	Input 3	Forced guidance	2 Bit	Send
3	Input 4	Switching	1 Bit	Send
3	Input 4	Value transmitter	8 Bit	Send
3	Input 4	Forced guidance	2 Bit	Send
4	Time	Time transmitter	3 Byte	Send
5	Date	Date transmitter	3 Byte	Send
6	Time and date	Demand time and date	1 Blt	Receive

#### **Description of objects:**

Object	Function	
Input 1, 2, 3, 4	Sends a switching, value transmitter or forced guidance telegram when the input switched ON or OFF.	
Time transmitter	Sends a "Time" telegram (EIS 3) with weekday and time components according to the parameter setting (every minute, every hour, every day or on request)	
Date transmitter	Sends a "Date" telegram (EIS 4) according to the parameter setting (every minute, every hour, every day or on request)	
Demand time and date	Receives a "Request time" telegram. The time and date is sent to the bus following receipt of the telegram.	

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Max. number of communication objects: 7
Max. number of group addresses: 8
Max. number of associations: 8

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## Parameter description:

Input x		
Function	Switching Value transmitter Forced guidance	Setting concerning whether a switching telegram (1 Bit), value telegram (8 Bit) or forced guidance (priority) telegram (2 Bit) is to be sent via the input.
Transmission at command of clock	Clock ON -> Clock ON, Clock OFF ->Clock OFF Clock ON -> Clock OFF, Clock OFF ->Clock ON	Parameter appears if object type "Switching" is set. Setting concerning whether a "0" or "1" telegram is to be sent when the clock channel switches accordingly.
Value at OFF command of clock	<b>0</b> 255	Parameter appears if object type "Value transmitter" is set. Setting concerning which value will be sent if the clock channel switches OFF.
Value at OFF command of clock	0 <b>255</b>	Parameter appears if object type "Value transmitter" is set. Setting concerning which value will be sent if the clock channel switches ON.
Forced guidance at OFF command of clock	Priority inactive Priority OFF Priority ON	Parameter appears when object type "Forced guidance" is set. Setting for which forced guidance (priority) value will be sent when the clock channel switches OFF.
Forced guidance at ON command of clock	Priority inactive Priority OFF Priority ON	Parameter appears when object type "Forced guidance" is set. Setting for which forced guidance (priority) value will be sent when the clock channel switches ON.
Cyclic transmission ?	NO YES	Setting concerning whether a telegram is only sent to the bus when the clock channel switches ON or if there will be a cyclic transmission response.

Cycle time		
Time for cyclic	approx. 3 min	Setting for cycle time to be used to repeat sending
transmission	approx. 5 min	telegram to the bus. This parameter applies for all
Input 1 4	approx. 10 min	channels where send response "Cyclic
Input 1 - 4	approx. 15 min	transmission" has been set.
	approx. 20 min	
	approx. 30 min	
	approx. 45 min	
	approx. 60 min	

Time/date		
Transmission of date and time	Only when demanded Each minute Each hour Each day	Setting for send condition for when the "Date" and "Time" telegram is sent to the bus.

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### Description of application programm: Switching, value transmitter, temperature, time and date reception

#### **Functional properties**

This applies offers the option that the following telegrams can be sent on each of the 4 channels:

- Switching telegram (1-Bit)
- Forced guidance (priority) telegram (2-Bit)
- Dimming or value telegram (8-Bit)
- Temperature telegram (16-Bit)
- Any telegram in EIS 5 format (16-Bit)

Furthermore, the contact making clock can receive time and date telegrams for the purpose of synchronising the time.

These time and date telegrams can, for example, be sent to the bus by a time switch 4gang with a DCF 77 receiver and the application "Switching, value transmitter, time and date transmission".

#### **Communications objects**

Obj.	Name	Function	Туре	Response
0	Input 1	Switching	1 Bit	Send
0	Input 1	Value transmitter	8 Bit	Send
0	Input 1	Forced guidance	2 Bit	Send
1	Input 2	Switching	1 Bit	Send
1	Input 2	Value transmitter	8 Bit	Send
1	Input 2	Forced guidance	2 Bit	Send
2	Input 3	Switching	1 Bit	Send
2	Input 3	Value transmitter	8 Bit	Send
2	Input 3	Forced guidance	2 Bit	Send
3	Input 4	Switching	1 Bit	Send
3	Input 4	Value transmitter	8 Bit	Send
3	Input 4	Forced guidance	2 Bit	Send
4	Input time	Time transmitter	3 Byte	Send
5	Input date	Date transmitter	3 Byte	Send

### Communications object description

Object name	Function	
Input 1, 2, 3, 4	Sends a switching, value transmitter or forced guidance telegram when the channel switches.	
Input 1, 2, 3, 4 (Temperature)	Sends a temperature telegram (EIS 5 with fixed exponents 3) when the switches.	
Input 1, 2, 3, 4 (Value transm. 16 Bit)	Sends a random 16 bit number value (EIS 5) when channel switches.	
Receiver of time	Receives a time telegram (EIS 3) with weekday and time components	
Receiver of date	Receives a date telegram (EIS 4) with weekday, month and year components	

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Max. number of communication objects:6Max. number of group addresses:8Max. number of assignments:8

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## Parameter description

Input x	T	
Function of input x	Switching Value transmitter Forced guidance Temperature Value transm. 16-Bit = (S*0.01*(M1+M2)* 2^exp.)	Setting for whether or not a switching (1 bit), value (8 bit), forced telegram (2 bit), temperature, value transmitter 16 Bit is to be sent over the input.
Transmission at OFF command of clock	OFF ON	Parameter appears when function "Switching" is set. Setting for whether or not a "0" or a "1" telegram will be sent when the clock channel switches OFF.
Transmission at ON command of clock	OFF ON	Parameter appears when function "Switching" is set. Setting for whether or not a "0" or a "1" telegram will be sent when the clock channel switches ON.
Value at OFF command of clock (0255)	<b>0</b> 255	Parameter appears when function "Value transmitter" is set. Setting for what value will be sent when the clock channel switches OFF.
Value at ON command of clock (0255)	0 <b>255</b>	Parameter appears when function "Value transmitter" is set. Setting for what value will be sent when clock channel switches ON.
Forced guidance at OFF command of clock	Forced guidance OFF Forced guidance ON, actuator OFF Forced guidance ON, actuator ON	Parameter appears when function "Forced guidance" is set. Setting for what forced guidance (priority) value will be sent when clock channel switches OFF.
Forced guidance at ON command of clock	Forced guidance OFF Forced guidance ON, actuator OFF Forced guidance ON, actuator ON	Parameter appears when function "Forced guidance" is set. Setting for what forced guidance (priority) value will be sent when clock channel switches ON.
Temperature value at OFF command of clock, (5°C30°C)	5 °C <b>15 °C</b> 30 °C	Parameter appears when function "Temperature" is set. Setting for what temperature value will be sent when the clock channel switches OFF.  Expert info: The temperature value is sent in EIS 5 format with firmly required exponents (3).
Temperature value at OFF command of clock, (5°C30°C)	5 °C <b>21 °C</b> 30 °C	Parameter appears when function "Temperature" is set. Setting for what temperature value will be sent when the clock channel switches ON.
Digit sign (S) at OFF command of clock	+1 -1	Parameter appears when function "16 bit value" is set. Setting for what 16 bit value will be sent when clock channel switchzes OFF. The numeric value is sent in EIS 5 format; it is calculated using the following formula: 16 bit value = (S*0.01*(M1+M2)* 2^exp.)
Mantissa 1 (M1)	256 512 768 1024 1280 1536 1792	Example: S = +1 M1 = 0 M2 = 255 exp = 0 $16 \text{ bit value} = (+1*0.01*(0+255)*2^0.)$
Mantissa 2 (M2)	<b>0</b> 255	16 bit value = 2,55
Exponent (exp): (015)	<b>0</b> 15	

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Digit sign (S) at ON command of clock	<b>+1</b> -1	Parameter appears when function "16 bit value" is set. Setting for what 16 bit value will be sent when the clock channel switches ON. The numeric value is set in EIS 5 format and is calculated using the following formula:
Mantissa 1 (M1)	0 256 512 768 1024 1280 1536 1792	16-Bit-Wert = (S*0.01*(M1+M2)* 2^exp.)  Example:  S = -1  M1 = 256  M2 = 88  exp = 3  16 bit value = (-1*0.01*(256+88)* 2^3.)  16 bit value = -6880
Mantissa 2 (M2)	0 <b>255</b>	
Exponent (exp): (015)	<b>0</b> 15	
Cyclic transmission ?	NO YES	Setting concerning whether telegram is only sent to bus when clock channel switches or if cyclic transmission is set.

Cycle time		
Cycle time	approx. 3 min. approx. 5 min. approx. 10 min. min1520304560 min.	Setting for cycle time used when telegram is repeated to bus. This parameter applies for all channels where "Cyclic transmission" is set.

### **Additional Expert Information**

#### A transferring of data between time switch 4gang and the EIB

A transferring of data between time switch 4gang and the EIB bus coupling unit only occurs if the clock is automatic mode.

Reason: In all other modes, data awaiting transmission can be changed and as a result, the data reaching the bus is not up to date. If a switching command should occur while the clock is not in automatic mode, then this will be performed after returning to Automatic mode.

#### **Bus synchronisation**

As previously mentioned, the timer uses the application "Switching, value transmitter, temperature, time and date" to receive time (EIS 3) and date telegrams (EOS 4) for the purpose of time synchronisation.

But the following points should be kept in mind with regard to this so-called bus synchronisation:

- Two time windows are available daily between 1:58:44 and 2:13:00 and between 2:58:44 and 3:13:00, during which time the clock is prepared to receive time and date telegrams.
- The clock is only ready independently to receive time and date telegrams once outside of the aforementioned time windows.
- A further possible is executing a so-called manual transmitter call. At that time, pressing the Date key for 3 seconds opens a time window for 14 minutes during which time the clock is once again ready to receive time and date telegrams (as often as wanted). Following this time window, the clock is once again prepared to independently receive time and date telegrams.
- Thus, one should bear in mind that the date will also be modified by +/- 1 day in the event of deviations of the weekday of more than one day. Time telegrams with deviations of more than one weekday will not be accepted. If no weekday is contained in the time telegram, then this will be accepted. The use of time telegrams without any indication of the weekday is not recommended, as this can lead to problems when transferring the date.

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- If the clock is also synchronised with a DCF signal, then synchronisation via the bus is blocked.

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#### Recommendation!

If an absolutely accurate synchronisation is required between certain locks within an EIB system then the synchronisation should be performed using the DCF signal. The transmission times from the bus (e.g. via several couplers) are not needed, especially for this procedure. Every time switch 4gang DCF - EIB is equipped with a suitable input port for the DCF antennae for this purpose.

#### In retrospect

If the time or the date is changed (via keypad inputting, radio or bus synchronisation) the clock performs a review. I.e., to avoid the chance that switching times are skipped and not executed, the clock re-calculates its switching modes. If the clock detects a change in the switching state, then these are set. However, the following points must be taken into consideration for the process that has a favourable principle:

- As manual actions (anticipated switching) cannot be kept in the switching time memory area, manual switching can be lost during the review under some circumstances.
- Similarly, impulses from the past cannot be recognised in the review process.

### Review is also performed:

- Following a Reset
- Following programming
- After deleting or changing switching times
- After summer or winter time changes