

Room thermostat with display VARIA 824, VARIA 826



VARIA 824	824 9 200
VARIA 826	826 9 200

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1 Functional characteristics

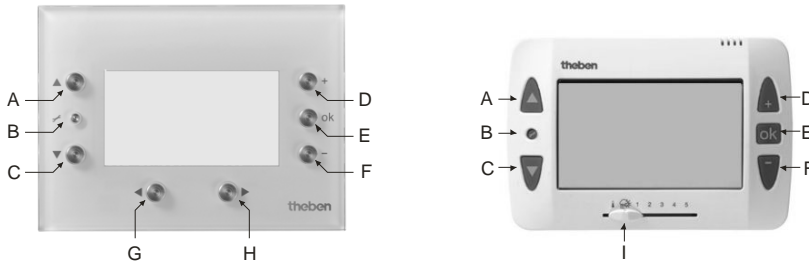
1.1 *Integrated functions*

- Room thermostat for heating and cooling operation with additional heating stage.
- 8 channel timer: 1 channel for controlling HVAC mode of room thermostat and 7 free channels.
- User-friendly switching on of light via hotkey function
- Up to 5 freely configurable screens
- Each screen can display a heading and up to 8 lines of text or functions,
→ equivalent to 40 channels.
- User-specific function with free choice of text for each line for sending or displaying received values or status telegrams
- Multi-lingual user interface

1.2 *Special features*

- Integrated timer with the option of sending 3 rather than just 2 different statuses.
- Reception and display of 14 byte text strings via the bus
- 1 display page for weather data
- Own physical address can be displayed

1.3 Operation



Key		
A	▼	UP cursor
B	🔧	Settings menu
C	▲	DOWN cursor
D	+	Increase value / reverse status
E	OK	Confirm entry
F	-	Reduce value / reverse status
G	◀	Previous page
H	▶	Next page
I		Select page

1.4 Differences between VARIA 824 and VARIA 826

Both devices have the same range of functions
 The only difference is how to operate the display pages.

- VARIA 826: The desired page is selected via two arrow keys and one favourite page can be selected per object.
- VARIA 824: The desired page is selected using a slide switch

2 Technical data

2.1 Technical data

Power supply:	230 V AC / 50 Hz for background lighting / bus voltage
Permitted operating temperature:	- 5 C°.. +45 C°
Power draw from the mains:	1.5 W
Current draw from bus voltage:	< 10 mA
Protection class:	III
Protection rating:	EN 60529: IP 21
Dimensions of device:	VARIA 824: 120 x 80 x 20 mm (L x W x H) VARIA 826: 128 x 94 x 22 mm (L x W x H)

3 Varia 824 / 826 EIB V1.0 application program

3.1 Selection in the product database

Manufacturer	THEBEN AG
Product family	Heating, ventilation, air conditioning
Product type	Controller with display
Program name	VARIA 824/826

This application program was produced for **ETS from version 3.0e**.

The ETS database can be found on our downloads page: <http://www.theben.de>

Table 1

Number of communication objects	129
Number of group addresses	154
Number of associations	154

3.2 Communication objects

Table 2: Overview

No.	Object name	Function	Type & DPT	Flags				
				C	R	W	T	U
0	Base setpoint value	Defining the setpoint temperature	2 byte 9.001	✓	✓	✓		
1	Manual setpoint offset	Transmit/receive manual offset	2 byte 9.002	✓	✓	✓	✓	
2	Outdoor temperature compensation	Adjust setpoint	2 byte	✓	✓	✓		
		Adjust setpoint	9.002	✓	✓	✓	✓	
3	Current setpoint value	Indicate current setpoint value	2 byte 9.001	✓	✓		✓	
4	Actual value	Transmit actual value	2 byte 9.001	✓	✓		✓	
5	External actual value	Receive external actual value	2 byte 9.001	✓	✓	✓		
6	Sensor failure	Report sensor failure	1 bit 1.001	✓	✓		✓	
7	Preselection of operating mode	Preselection of operating mode	1 byte 5.010	✓	✓	✓		
	Night < - > standby	1 = night, 0 = standby	1 bit 1.001					
8	Presence	Input for presence signal	1 bit	✓	✓	✓		
	Comfort	1 = Comfort	1.001					
9	Window state	Input for window contact	1 bit	✓	✓	✓		
	Frost protection	1 = Frost protection	1.001					
10	Operation mode of switching program	Report internal operation mode	1 byte 5.010	✓	✓		✓	
11	Lock switching program	Lock switching program = 1	1 bit 1.001	✓	✓	✓		
12	Current operating mode	Report Current operating mode	1 byte 5.010	✓	✓		✓	
13	Heating actuating value (%)	Transmit actuating value	1 byte 5.001	✓	✓		✓	
	2 point heating actuating value	Transmit actuating value	1 bit 1.001					
14	Heating PWM actuating value	Transmit actuating value	1 bit 1.001	✓	✓		✓	
15	Additional heating stage actuating value (%)	Transmit actuating value	1 byte 5.001	✓	✓		✓	
	2 point additional heating stage actuating value	Transmit actuating value	1 bit 1.001					

C R W T U

Continuation:

No.	Object name	Function	Type & DPT	Flags				
				C	R	W	T	U
16	<i>Cooling actuating value (%)</i>	<i>Transmit actuating value</i>	1 byte 5.001	✓	✓		✓	
	<i>2 point cooling actuating value</i>	<i>Transmit actuating value</i>	1 bit 1.001	✓	✓		✓	
17	<i>Cooling PWM actuating value</i>	<i>Transmit cooling actuating value</i>	1 bit 1.001	✓	✓		✓	
18	<i>Report heating mode/cooling mode</i>	<i>Heating = 0, cooling = 1</i>	1 bit 1.001	✓	✓	✓	✓	
	<i>Switchover between heating and cooling</i>	<i>Heating = 0, cooling = 1</i>						
19	<i>No energy medium</i>	<i>1 = No energy medium</i>	1 bit 1.001	✓	✓		✓	
20	<i>Operation mode scene</i>	<i>Scenes 1-16 = 0 ..15</i>	1 byte 18.001	✓	✓	✓		
21	<i>Hotkey function</i>	<i>Switchover</i>	1 bit 1.001	✓	✓	✓	✓	
22	<i>Forced fan stage</i>	<i>Transmit/receive</i>	1 byte 5.001	✓	✓	✓	✓	
23	<i>Fan forced/auto mode</i>	<i>1 = Forced/ 0 = Auto</i>	1 bit	✓	✓	✓	✓	
	<i>Fan auto/forced mode</i>	<i>1 = Auto / 0 = Forced</i>	1.001					
24	<i>Time</i>	<i>Receive time</i>	1 byte	✓	✓	✓		
		<i>Transmit / receive time</i>	10.001	✓	✓	✓	✓	
25	<i>Date</i>	<i>Receive date</i>	1 byte	✓	✓	✓		
		<i>Transmit / receive date</i>	11.001	✓	✓	✓	✓	
26	<i>Time query</i>	<i>Transmit time and date</i>	1 bit 1.001	✓		✓		
27	<i>Outside temperature</i>	<i>Receive outside temperature</i>	2 byte 9.001	✓	✓	✓		
28	<i>Wind speed</i>	<i>Receive wind speed</i>	2 byte 9.005	✓	✓	✓		
29	<i>Brightness</i>	<i>Receive brightness</i>	2 byte 9.004	✓	✓	✓		
30	<i>Rain</i>	<i>Receive rain status</i>	1 bit 1.001	✓	✓	✓		
31	<i>Min/max recording of weather data</i>	<i>Start min/max recording</i>	1 bit 1.001	✓	✓	✓	✓	
				C	R	W	T	U

Continuation:

No.	Object name	Function	Type & DPT	Flags				
				C	R	W	T	U
32	<i>Switching program channel 2</i>	<i>Transmit temperature in K</i>	2 byte 9.002	✓	✓		✓	
		<i>Transmit temperature in °C</i>	2 byte 9.001	✓	✓		✓	
		<i>Transmit percentage value</i>	1 byte 5.001	✓	✓		✓	
		<i>Transmit On/Off</i>	1 bit 1.001	✓	✓		✓	
		<i>Transmit value 0..255</i>	1 byte	✓	✓		✓	
		<i>Transmit HVAC op. mode</i>	20.102	✓	✓		✓	
33	<i>Switching program chan. 3</i>	<i>See object 32</i>	-	✓	✓		✓	
34	<i>Switching program chan. 4</i>	<i>See object 32</i>	-	✓	✓		✓	
35	<i>Switching program chan. 5</i>	<i>See object 32</i>	-	✓	✓		✓	
36	<i>Switching program chan. 6</i>	<i>See object 32</i>	-	✓	✓		✓	
37	<i>Switching program chan. 7</i>	<i>See object 32</i>	-	✓	✓		✓	
38	<i>Switching program chan. 8</i>	<i>See object 32</i>	-	✓	✓		✓	
39	<i>Display page 1, line 1</i>	<i>Text string</i>	14 byte 16.001	✓	✓	✓		
	<i>Display page 1, line 1</i>	<i>Switching ON/OFF</i>	1 bit	✓	✓	✓		✓
	<i>Operation page 1, line 1</i>		1.001	✓	✓	✓	✓	
	<i>Display page 1, line 1</i>	<i>Percentage value</i>	1 byte	✓	✓	✓		✓
	<i>Operation page 1, line 1</i>		5.001	✓	✓	✓	✓	
	<i>Display page 1, line 1</i>	<i>HVAC operation mode</i>	1 byte	✓	✓	✓		✓
	<i>Operation page 1, line 1</i>		20.102	✓	✓	✓	✓	
	<i>Display page 1, line 1</i>	<i>Value 0..255</i>	1 byte	✓	✓	✓		✓
	<i>Operation page 1, line 1</i>		5.010	✓	✓	✓	✓	
	<i>Display page 1, line 1</i>	<i>Dim brighter / darker</i>	4 bit	✓	✓	✓		✓
	<i>Operation page 1, line 1</i>		3.007	✓	✓	✓	✓	
	<i>Display page 1, line 1</i>	<i>Temperature</i>	2 byte	✓	✓	✓		✓
	<i>Operation page 1, line 1</i>		9.001	✓	✓	✓	✓	
	<i>Display page 1, line 1</i>	<i>EIS 5 value</i>	2 byte	✓	✓	✓		✓
	<i>Operation page 1, line 1</i>		9.*	✓	✓	✓	✓	
	<i>Display page 1, line 1</i>	<i>Counter value 0 ..65535</i>	2 byte	✓	✓	✓		✓
	<i>Operation page 1, line 1</i>		7.001	✓	✓	✓	✓	
	<i>Display page 1, line 1</i>	<i>Scene</i>	1 byte	✓	✓	✓		✓
	<i>Operation page 1, line 1</i>		18.001	✓	✓	✓	✓	
	<i>Display page 1, line 1</i>	<i>Blinds up/down</i>	1 bit	✓	✓	✓		✓
<i>Operation page 1, line 1</i>	1.008		✓	✓	✓	✓		
<i>Display page 1, line 1</i>	<i>Value</i>	1 byte	✓	✓	✓		✓	
<i>Operation page 1, line 1</i>		5.010	✓	✓	✓	✓		
				C	R	W	T	U

Continuation:

No.	Object name	Function	Type & DPT	Flags				
				C	R	W	T	U
40	<i>Operation page 1, line 1</i>	<i>Dimming On/Off</i>	1 bit 1.001	✓	✓	✓	✓	
		<i>Blinds Step/Stop</i>	1 bit 1.001	✓	✓	✓	✓	
41	<i>Display page 1, line 2</i>	<i>See object 39</i>	-	✓	✓	✓		✓
	<i>Operation page 1, line 2</i>		-	✓	✓	✓	✓	
42	<i>Operation page 1, line 2</i>	<i>See object 40</i>	-	✓	✓	✓	✓	
43	<i>Display page 1, line 3</i>	<i>See object 39</i>	-	✓	✓	✓		✓
	<i>Operation page 1, line 3</i>		-	✓	✓	✓	✓	
44	<i>Operation page 1, line 3</i>	<i>See object 40</i>	-	✓	✓	✓	✓	
45	<i>Display page 1, line 4</i>	<i>See object 39</i>	-	✓	✓	✓		✓
	<i>Operation page 1, line 4</i>		-	✓	✓	✓	✓	
46	<i>Operation page 1, line 4</i>	<i>See object 40</i>	-	✓	✓	✓	✓	
47	<i>Display page 1, line 5</i>	<i>See object 39</i>	-	✓	✓	✓		✓
	<i>Operation page 1, line 5</i>		-	✓	✓	✓	✓	
48	<i>Operation page 1, line 5</i>	<i>See object 40</i>	-	✓	✓	✓	✓	
49	<i>Display page 1, line 6</i>	<i>See object 39</i>	-	✓	✓	✓		✓
	<i>Operation page 1, line 6</i>		-	✓	✓	✓	✓	
50	<i>Operation page 1, line 6</i>	<i>See object 40</i>	-	✓	✓	✓	✓	
51	<i>Display page 1, line 7</i>	<i>See object 39</i>	-	✓	✓	✓		✓
	<i>Operation page 1, line 7</i>		-	✓	✓	✓	✓	
52	<i>Operation page 1, line 7</i>	<i>See object 40</i>	-	✓	✓	✓	✓	
53	<i>Display page 1, line 8</i>	<i>See object 39</i>	-	✓	✓	✓		✓
	<i>Operation page 1, line 8</i>		-	✓	✓	✓	✓	
54	<i>Operation page 1, line 8</i>	<i>See object 40</i>	-	✓	✓	✓	✓	
55	<i>Page 2 line 1</i>	<i>See object 39</i>	-	✓	✓	✓	✓	✓
56		<i>See object 40</i>	-	✓	✓	✓	✓	
57	<i>Page 2 line 2</i>	<i>See object 39</i>	-	✓	✓	✓	✓	✓
58		<i>See object 40</i>	-	✓	✓	✓	✓	
59	<i>Page 2 line 3</i>	<i>See object 39</i>	-	✓	✓	✓	✓	✓
60		<i>See object 40</i>	-	✓	✓	✓	✓	
61	<i>Page 2 line 4</i>	<i>See object 39</i>	-	✓	✓	✓	✓	✓
62		<i>See object 40</i>	-	✓	✓	✓	✓	
63	<i>Page 2 line 5</i>	<i>See object 39</i>	-	✓	✓	✓	✓	✓
64		<i>See object 40</i>	-	✓	✓	✓	✓	
65	<i>Page 2 line 6</i>	<i>See object 39</i>	-	✓	✓	✓	✓	✓
66		<i>See object 40</i>	-	✓	✓	✓	✓	
67	<i>Page 2 line 7</i>	<i>See object 39</i>	-	✓	✓	✓	✓	✓
68		<i>See object 40</i>	-	✓	✓	✓	✓	
69	<i>Page 2 line 8</i>	<i>See object 39</i>	-	✓	✓	✓	✓	✓
70		<i>See object 40</i>	-	✓	✓	✓	✓	
71	<i>Page 3 line 1</i>	<i>See object 39</i>	-	✓	✓	✓	✓	✓
72		<i>See object 40</i>	-	✓	✓	✓	✓	

C R W T U

Continuation:

No.	Object name	Function	Type & DPT	Flags				
				C	R	W	T	U
73	Page 3 line 2	See object 39	-	✓	✓	✓	✓	✓
74		See object 40	-	✓	✓	✓	✓	
75	Page 3 line 3	See object 39	-	✓	✓	✓	✓	✓
76		See object 40	-	✓	✓	✓	✓	
77	Page 3 line 4	See object 39	-	✓	✓	✓	✓	✓
78		See object 40	-	✓	✓	✓	✓	
79	Page 3 line 5	See object 39	-	✓	✓	✓	✓	✓
80		See object 40	-	✓	✓	✓	✓	
81	Page 3 line 6	See object 39	-	✓	✓	✓	✓	✓
82		See object 40	-	✓	✓	✓	✓	
83	Page 3 line 7	See object 39	-	✓	✓	✓	✓	✓
84		See object 40	-	✓	✓	✓	✓	
85	Page 3 line 8	See object 39	-	✓	✓	✓	✓	✓
86		See object 40	-	✓	✓	✓	✓	
87	Page 4 line 1	See object 39	-	✓	✓	✓	✓	✓
88		See object 40	-	✓	✓	✓	✓	
89	Page 4 line 2	See object 39	-	✓	✓	✓	✓	✓
90		See object 40	-	✓	✓	✓	✓	
91	Page 4 line 3	See object 39	-	✓	✓	✓	✓	✓
92		See object 40	-	✓	✓	✓	✓	
93	Page 4 line 4	See object 39	-	✓	✓	✓	✓	✓
94		See object 40	-	✓	✓	✓	✓	
95	Page 4 line 5	See object 39	-	✓	✓	✓	✓	✓
96		See object 40	-	✓	✓	✓	✓	
97	Page 4 line 6	See object 39	-	✓	✓	✓	✓	✓
98		See object 40	-	✓	✓	✓	✓	
99	Page 4 line 7	See object 39	-	✓	✓	✓	✓	✓
100		See object 40	-	✓	✓	✓	✓	
101	Page 4 line 8	See object 39	-	✓	✓	✓	✓	✓
102		See object 40	-	✓	✓	✓	✓	
103	Page 5 line 1	See object 39	-	✓	✓	✓	✓	✓
104		See object 40	-	✓	✓	✓	✓	
105	Page 5 line 2	See object 39	-	✓	✓	✓	✓	✓
106		See object 40	-	✓	✓	✓	✓	
107	Page 5 line 3	See object 39	-	✓	✓	✓	✓	✓
108		See object 40	-	✓	✓	✓	✓	
109	Page 5 line 4	See object 39	-	✓	✓	✓	✓	✓
110		See object 40	-	✓	✓	✓	✓	
111	Page 5 line 5	See object 39	-	✓	✓	✓	✓	✓
112		See object 40	-	✓	✓	✓	✓	
113	Page 5 line 6	See object 39	-	✓	✓	✓	✓	✓
114		See object 40	-	✓	✓	✓	✓	

C R W T U

Continuation:

No.	Object name	Function	Type & DPT	Flags				
				C	R	W	T	U
115	Page 5 line 7	See object 39	-	✓	✓	✓	✓	✓
116		See object 40	-	✓	✓	✓	✓	
117	Page 5 line 8	See object 39	-	✓	✓	✓	✓	✓
118		See object 40	-	✓	✓	✓	✓	
119	Backlit LCD	Switching On/Off	1 bit 1.001	✓	✓	✓		
120	Acoustic signal	On/Off	1 bit 1.001	✓	✓	✓		
121	Launch favourites page	Only with Varia 826	1 bit 1.001	✓	✓	✓		
122	Lock switching program channel 2	Lock switching program = 1	1 bit 1.001	✓	✓	✓		
123	Lock switching program channel 3	Lock switching program = 1	1 bit 1.001	✓	✓	✓		
124	Lock switching program channel 4	Lock switching program = 1	1 bit 1.001	✓	✓	✓		
125	Lock switching program channel 5	Lock switching program = 1	1 bit 1.001	✓	✓	✓		
126	Lock switching program channel 6	Lock switching program = 1	1 bit 1.001	✓	✓	✓		
127	Lock switching program channel 7	Lock switching program = 1	1 bit 1.001	✓	✓	✓		
128	Lock switching program channel 8	Lock switching program = 1	1 bit 1.001	✓	✓	✓		
				C	R	W	T	U

Table 3: Communication flags

Flag	Name	Application
C	Communication	Object can communicate
R	Read	Object status can be viewed (ETS / display etc.)
W	Write	Object can receive
T	Transmit	Object can transmit
U	Update	Object can accept answer to its own read requests

3.2.1 Description of objects

- **Object 0 "Base setpoint value"**

The base setpoint value is first specified via the application at start-up and stored in the "Base setpoint value" object.

It can be reset at any time using object 0 (limited by minimum or maximum valid setpoint value).

If the bus voltage fails, this object is backed up and the last value is restored when the bus voltage returns. The object can be described as required.

- **Object 1 "Manual setpoint value adjustment"**

The object receives a temperature differential in EIS 5 format. The desired room temperature (current setpoint value) can be adjusted from the base setpoint value by this differential.

The following applies in comfort mode (heating):

Current setpoint value (object 3) = Base setpoint value (Obj. 0) + manual setpoint value offset (Obj. 1)

Values outside the configured range are limited to the highest or lowest value.

Note:

The offset always refers to the set base setpoint value and not to the [current setpoint value](#).

If a 0 is received, a previously entered setpoint value offset is reset to 0 K.

- **Object 2 "Outdoor temperature compensation"**

The function of the object is determined by the *Setpoint adjustment with high outside temperatures* parameter on the *RTR setting* parameter page.

Receive only:

Receives the correction value for setpoint adjustment.

Calculate internally and transmit:

Reports the current setpoint adjustment as an amount or as a differential.

The *format of the correction value* is set on the *setpoint adjustment* parameter page.

Table 4

<i>Format of adjustment value</i>	Object function	Example
<i>Absolute</i>	Transmits the amount: <i>Base unadjusted setpoint</i> + <i>setpoint correction</i> as setpoint value for additional temperature controls.	<i>Base setpoint without adjustment = 20°C. Setpoint adjustment = +2 K</i> The object transmits : 22 °C
<i>Relative</i>	Calculated setpoint adjustment (in Kelvin) based on outside temperature.	<i>Base setpoint without adjustment = 20°C. Setpoint adjustment = +2 K</i> The object transmits : 2 K*

- **Object 3 "Current setpoint value"**

This object sends the current setpoint temperature as a EIS 5 telegram (2 bytes) to the bus. The transmit response can be set on the *setpoint values* parameter page.

- **Object 4 "Actual value"**

This object sends the temperature currently being measured by the sensor (if sending via configuration is permitted).

- **Object 5 "External actual value"**

Receives the room temperature from another measurement point via the bus. This object can be activated on the actual value parameter page.

- **Object 6 "Sensor failure"**

Reports error if the temperature sensor connection is interrupted or shorted.
Error = 1

- Object 7 "Preselection of operating mode", "Night <-> standby"

The function of this object depends on the *Objects for setting operation mode* parameter on the *RTR setting* parameter page.

Table 5

Objects to select operating mode	Object function
New: Operation mode, presence, window status	<p>Here is a 1-byte object. One of 4 operation modes can be directly activated.</p> <p>0 = Auto i.e. the operating mode depends on the switching program (channel 1)</p> <p>1 = Comfort</p> <p>2 = Standby</p> <p>3 = Night,</p> <p>4 = Frost protection (heat protection)</p> <p>Values over 4 are ignored.</p> <p>If the switching program is locked or not used, the configured <i>operating mode after reset</i> is accepted unit until a new and valid operating mode is received or the operating mode on the device is changed by the user.</p>
Old: Comfort, night, frost	<p>With this setting, the object is a 1 bit object. Night or standby operation mode can be activated.</p> <p>0=Standby 1=Night</p>

- Object 8 "Presence" / "comfort"

The function of this object depends on the *objects for setting operation mode* parameter on the *RTR setting* parameter page.

Table 6

Objects to select operating mode	Object function
New: Operation mode, presence, window status	<p>Presence: The status of a presence indicator (e.g. sensor, movement detector) can be received via this object. 1 on this object activates the comfort operation mode.</p>
Old: Comfort, night, frost	<p>Comfort: 1 on this object activates the comfort operation mode. This operation mode takes priority over night and standby modes. Comfort mode is deactivated by sending a 0 to the object. Important: This object should not be sent events cyclically as a comfort extension is deleted (via the button the device) if a 0 is received.</p>

- **Object 9 "Window state" / "frost/heat protection"**

The function of this object depends on the *objects for setting operation mode* parameter on the *RTR setting* parameter page.

Table 7

Objects to select operating mode	Object function
New: Operating mode, presence, window status	<p>Window state: The status of a window contact can be received via this object. 1 on this object activates the frost / heat protection operation mode.</p>
Old: Comfort, night, frost	<p>Frost/heat protection: 1 on this object activates the frost protection operation mode. The heat protection operation mode is activated during cooling. The frost/heat protection operation mode takes top priority. The frost/heat protection mode remains until it is cleared again by entering 0.</p>

- **Object 10 "Switching program operation mode"**

Always sends the operation mode defined by the switching program on channel 1.
 This also applies if the room thermostat has been changed to another operation mode by a presence sensor, push of a button etc.

- **Object 11 "Switching program lock"**

Receive object: Lock = 1.
 Makes the switching program on channel 1 inoperative.

- **Object 12 "Current operating mode"**

Transmits the Current operating mode as a 1 byte value (see below: Coding of operation modes).

The transmit response can be set on the *RTR setting* parameter page.

Table 8: Coding of HVAC operation modes:

Value	Operation mode
1	Comfort
2	Standby
3	Night
4	Frost protection/heat protection

- **Object 13 "Heating actuating value %", "Heating and cooling actuating value %", "2-point heating actuating value", "2-point cooling actuating value"**

Sends the current heating actuating value (0...100%) or heating or cooling if the *output of cooling actuating value* parameter has been set to *together with heating actuating value* (objects 13 & 14) (*Cooling control* parameter page).

- **Object 14 "Heating and cooling PWM actuating value"**

The actuating value is emitted as a PWM signal (ON/OFF).

See appendix: [PWM cycle](#)

- **Object 15 "Additional heating stage actuating value (%)", "2-point additional stage actuating value"**

This object is only available if the additional heating stage is used.

The *number of heating stages* parameter must also be set to *main stage and additional stage*.

See heating control parameter page.

The transmit format, EIS6 or EIS1, depends on the selected *type of control* on the *heating control* parameter page.

- **Object 16 "Cooling actuating value (%)", "2-point cooling actuating value"**

Sends the current actuating value or cooling switching command depending on the *type of control* selected on the *cooling control* parameter page.

The object is only available if the cooling function has been selected on the *general* parameter page (*control= heating and cooling*).

- **Object 17 "PWM cooling actuating value"**

Sends a PWM signal (ON/OFF) that corresponds to the current actuating value.
See appendix: [PWM cycle](#).

- **Object 18 "Report heating/cooling operation", "switch between heating and cooling"**

The object is available if the cooling function has been selected on the General parameter page (control= heating and cooling).
The function of the object depends on the *switching between heating and cooling* parameter on the *cooling control* parameter page.

Table 9

<i>Switchover between heating and cooling</i>	Function
<i>Automatic</i>	Reports whether the room thermostat is currently operating in heating or cooling mode. Heating = 0, Cooling = 1
<i>Via object</i>	Receives the switching command for switching between heating and cooling mode. Heating = 0, Cooling = 1

- **Object 19 "No energy medium"**

Error reporting object:
An error is reported in the following cases (object status = 1):

Case 1: Heating mode was forced via the *switching between heating and cooling* object, however the room temperature is so far above the setpoint temperature that cooling would be required.

Case 2: Cooling mode was forced via the *switching between heating and cooling* object, however the room temperature is so far below the setpoint temperature that heating would be required.

- **Object 20 " Operation mode scene"**

Scenes can be saved or retrieved via this object.
The Current operating mode is allocated to the selected scene number when saving.
Up to 16 different scenes are supported.
See appendix: [The scenes](#).

- **Object 21 "Hotkey function"**

The hotkey function is available on the RTR and on the weather page. Pressing one of the buttons on the right (+, OK or -) triggers the sending of a switching telegram. Pushing the button again reverses the switching status.

This function makes it possible to switch room lighting on/off quickly when entering a room without having to first select a specific page.

Note:

The hotkey function must be activated in the ETS on the *RTR* parameter page

While a setpoint value or operation mode can be set, i.e. by pressing one of the cursor keys on the left, only the buttons on the right fulfil the setting task.

The hotkey function only becomes available again if the setpoint value and operation mode are no longer blacked out.

- **Object 22 "Fan stage in forced mode"**

The object is available if the *fan stage control* parameter has been set to *yes* (*RTR setting* parameter page).

If a manual fan stage is selected on the device, this object sends a percentage value that corresponds to the configured threshold value.

See appendix: [Fan forced mode](#)

The forced fan step has no effect on the actuating value.

- **Object 23 "Fan forced/ auto ", "fan auto/forced"**

The object is available if the *fan stage control* parameter has been set to *yes* (*RTR setting* parameter page).

Sends a forced command to the fan coil actuator or to fan control if a fan stage on the device is set manually on the RTR display page.

The desired fan step for forced operation is sent by object 22 .

See appendix: [Fan forced operation](#).

- **Object 24 "Transmit time", "receive time"**

The function of the object depends on the *objects time and date function* parameter on the *general* parameter page.

Table 10

<i>Function of time and date functions</i>	Function
<i>Receive time and date</i>	Receives time from bus for setting the internal real time clock.
<i>Transmit and receive time and date</i>	Can both receive the time as well as transmit it to the bus. See object 26.

Format: KNX DPT 10.001 / EIS 3

- **Object 25 "Transmit date", "receive date"**

The function of the object depends on the *objects time and date function* parameter on the *general* parameter page.

Table 11

<i>Function of time and date functions</i>	Function
<i>Receive time and date</i>	Receives date from bus for setting the internal real time clock.
<i>Transmit and receive time and date</i>	Can both receive the date as well as transmit it to the bus. See object 26.

Note: If neither date nor time have been received, (e.g. after reset without battery), the date display will be Mon 00.00.00 and the time display 00:00.

The date only sets itself to 1.1.2008 when the time has been received until a valid date telegram is received.

Format: KNX DPT 11.001 / EIS 4

- **Object 26 "Time query"**

If this object is described with a 1 or a 0, VARIA immediately sends a time and date telegram. This object only appears if the *transmit and receive time and date* function has been selected.

- **Object 27 "Outside temperature"**

Receives the current outside temperature, e.g. from a weather station (order no. 132 9 201). The received value can appear on the *weather* display page and is needed as a reference for calculation of the setpoint value adjustment at high outside temperatures.

- **Object 28 "Wind speed"**

Receives the current wind speed, e.g. from a weather station (order no. 132 9 201) for display on the *weather* page.

- **Object 29 "Brightness"**

Receives the current brightness value, e.g. from a weather station (order no. 132 9 201) for display on the *weather* page.

- **Object 30 "Rain"**

Receives the current rain status, e.g. from a weather station (order no. 132 9 201) for display on the *weather* page.

- **Object 31 "Reset Min/max recording of weather data"**

When the object receives a 1, the stored min./max. values of objects 27..30 on the weather page are deleted and a new recording is started.

- **Objects 32..38 "Switching program channel 2..8"**

Sends the status of the individual switching program from channel 2..channel 8. The telegram format is set on the relevant *switching program channel 2..8* parameter page via the *type of switching program*.

- Objects 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117
"Display page 1.. 5, line 1.. 8", "Operate page 1.. 5, line 1.. 8"

These objects are for controlling text lines 1 to 8 on the [customer specific display pages](#) Page 1 to 5.

Data orientation depends on the *allow change to object value?* parameter From (see table 12).

The type of data is set via the *line format* parameter on the relevant display page (e.g. *page 1, line 1*).

Table 12: Data orientation

<i>Authorise amendment of object value?</i>	Function
<i>Yes</i>	<i>Operation page 1..5, line 1..8</i> The value/status on the display line can be changed by the user on the device. The changed value is sent to the bus and can be overwritten with received values.
<i>No</i>	<i>Display page 1..5, line 1..8</i> Values are received from the bus and only displayed in the display line.

- Objects 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102,104, 106, 108, 110, 112, 114, 116, 118
"to operate page 1.. 5, line 1.. 8"

This object is only available if *dim* or *blinds/shutters* object types are set as *line format*.

Table 13

<i>Line format</i>	Function
<i>Dimming</i>	Sends On/Off telegram to the dimmer
<i>Blinds/shutters</i>	Sends the Step/Stop telegrams to the blinds actuator

- **Object 119 "LCD backlighting"**

Enables switching on and off of LCD backlighting via the bus.

This means, for example, that all displays can be turned off simultaneously.

- **Object 120 "Acoustic signal"**

Controls the installed buzzer.

1 = On every 2 secs for 100 millisecs.

0 = Off

- **Object 121 "Select favourite pages"**

If a 1 is received, the display changes from VARIA 826 to the set favourite page.
The favourite page is set on the *select display pages* parameter page.

Important: This function is only available with the VARIA 826.

- **Objects 122..128 "Lock switching program channel 2..8"**

Locks the relevant channel.

1 = Locked, i.e. object does not transmit.

0 = Enable.

3.3 Parameters

3.3.1 Parameter pages



Table 14

Name	Description
General	Heating/cooling, language, releases, summer time rule etc.
RTR setting	Operation modes, presence detector, fan control etc.
Heating setpoint values	Base setpoint value, reductions, offset.
Cooling setpoint values	Dead zone, increases, heating protection.
Heating control	Type of control, heating stages, control parameters, PWM time.
Cooling control	Type of control, control parameters, PWM time.
Additional stage heating	Type of control, control parameters, transmit response.
Actual value	Source for actual value measurement, actual value monitoring.
Fan stages	Number, threshold values, compulsory control.
Setpoint shift	Setting maximum adjustment.
Switching program Channel 1	Settings for the internal HVAC switching program.
Switching program Channel 2.0.8	Settings for the freely selectable programs.
Select display pages	Activation of weather page and freely programmable display pages
Weather data	Display outside measurements: Temperature, wind, rain and min./max. values.
Display objects page 1..5	Heading and favourite line
Page 1, line 1 to page 5, line 8	Unrestricted text entry and choice of function for each text line of display pages 1..5.
Text list	Customer-specific designation for scene numbers and valuator stages.


3.3.2 Parameter description

3.3.2.1 The “General” parameter page

Table 15

Designation	Values	Description
<i>Settings menu on device</i>	<p><i>Disabled</i></p> <p><i>Enabled</i></p> <p><i>Released via PIN</i></p>	<p>Selection of settings menu  on device: Operation not possible.</p> <p>Possible at any time</p> <p>Only possible if correct PIN has been entered</p>
<i>Selection of temperature menu</i>	<p><i>Adjustable on device</i></p> <p><i>Not possible on device</i></p>	<p>Determines whether the setpoint values on the device can be set in temperature  → settings menu.</p>
<i>Setpoint value settings on device</i>	<p><i>Unchanged after download</i></p> <p><i>Overwrite via download</i></p>	<p>The setpoint values set on the device are stored after download if, for example, only customer-specific texts or control-independent parameters. Important: However, ETS has to overwrite the setpoint values if the following basic controller parameters are changed:</p> <ul style="list-style-type: none"> - Type of control (continuous/2-point) both during heating and cooling operation - Hysteresis of 2-point control - Control (only heating control / heating and cooling) <p>When downloading all the setpoint values entered on the device are replaced by the ETS values</p>

Continuation:

Designation	Values	Description
<i>Language after download</i>	<p><i>Unchanged</i></p> <p>German <i>English</i> <i>French</i> <i>Italian</i> <i>Spanish</i> <i>Dutch</i> <i>Swedish</i> <i>Reserved for additional language 2</i> ... <i>Reserved for additional language 9</i></p>	<p>The language set by the user remains unchanged after download.</p> <p>Desired menu language after download</p> <p>Reserved for future upgrades: Do not select.</p>
<i>Function of time and date functions</i>	<p>Receive time and date</p> <p><i>Transmit and receive time and date</i></p>	<p>Varia can be set via the bus.</p> <p>Varia can both be set via the bus and time can be sent precisely to the bus.</p> <p>To achieve the highest accuracy, we recommend sending the time with a ZS 600 DCF time transmitter and only use VARIA as time-transmitter (<i>receive time and date</i>).</p>
<i>Summer time rules</i>	<p><i>Adjustable on device</i></p> <p><i>None</i></p> <p>EU <i>GB/IRL/P</i> <i>USA</i> <i>FIN/GR/TR</i></p>	<p>The desired summer time rule can be set directly on the device. (Settings menu  → Date and time).</p> <p>No summer time changeover required.</p> <p>Adjustment to location.</p>

3.3.3 The RTR setting parameter page

Table 16

Designation	Values	Application
<i>Control</i>	<p>Heating control only</p> <p><i>Heating and cooling</i></p>	<p>Heating operation only</p> <p>An additional cooling system can be controlled</p> <p>Important: If this parameter is changed, then all the setpoint values entered on the device will be deleted during download and overwritten with the current ETS values.</p>
<i>Objects to select operating mode</i>	<p>New: Operation mode, presence, window status</p> <p><i>Old: Comfort, night, frost (not recommended)</i></p>	<p>Varia can switch the operation mode depending on the window and presence contacts.</p> <p>Traditional setting without window and presence status.</p> <p>Important: As long as frost protection object = 1 (obj. 9) then no other operation mode can be selected.</p>
<i>Operation mode after reset (if no switching program is active)</i>	<p><i>Frost protection</i></p> <p><i>Night-time temperature reduction</i></p> <p>Standby</p> <p><i>Comfort</i></p>	<p>Operation mode after start-up or reprogramming.</p> <p>Important: Switching programs have priority</p>
<i>Cyclical transmission of Current operating mode</i>	<p>Not cyclical, only in the event of change</p> <p><i>Every 2 min.</i></p> <p><i>Every 3 min.</i></p> <p><i>Every 5 min.</i></p> <p><i>Every 10 min.</i></p> <p><i>Every 15 min.</i></p> <p><i>Every 20 min.</i></p> <p><i>Every 30 min.</i></p> <p><i>Every 45 min.</i></p> <p><i>Every 60 min.</i></p>	<p>How often should the Current operating mode be sent?</p>

Continuation:

Designation	Values	Description
<p><i>Presence sensor type (to object 8)</i></p>	<p><i>Presence detector</i></p> <p><i>Presence push button</i></p>	<p>The presence sensor activates comfort operation mode.</p> <p>Comfort operation mode as long as the presence object is set*.</p> <ol style="list-style-type: none"> 1. If a new operation mode is received on object 7 with the presence object set (<i>preselection of operating mode</i>), then it is accepted and the presence object is reset. 2. Reception of the same operation mode prior to the presence status (e.g. via cyclical sending) is ignored. 3. If the presence object is set during night / frost operation, it is reset after the configured comfort extension finishes* 4. If the presence object is set during standby mode, the comfort operation mode is accepted without time restriction.

Continuation:


Designation	Values	Application
<p><u>Setpoint value adjustment at high outside temperature</u></p>	<p><i>None</i></p> <p><i>Receive only</i></p> <p><i>Calculate internally and transmit</i></p>	<p>Function is deactivated</p> <p>The adjustment value is received by the bus and own setpoint value is adjusted to increase in outside temperature.</p> <p>Outside temperature is received on object 27. The setpoint value adjustment is made based on this temperature, passed internally to the RTR and sent to other bus users from object 2.</p> <p>See <u>Setpoint value adjustment parameter page</u></p>
<p><i>Display switching program on RTR page</i></p>	<p><i>Yes</i></p> <p><i>No</i></p>	<p>Is switching program 1 (operation modes for the current day) to be shown on the room thermostat display page?</p> <p>If <i>no program</i> is selected for channel 1 (either on device or via parameter) then no program bar will appear.</p>
<p><i>Temperature display on RTR page</i></p>	<p><i>Actual value, setpoint value only when operated</i></p> <p><i>Always setpoint value</i></p>	<p>The current room temperature is displayed on the RTR page. The setpoint value is revealed by pressing a button.</p> <p>Only displays the setpoint value on the RTR page.</p>

3.3.4 Heating setpoint values parameter page

Table 17

Designation	Values	Application
<i>Base setpoint value after loading the application</i>	16 °C, 17 °C, 18 °C, 19 °C 20 °C, 21 °C , 22 °C, 23 °C 24 °C, 25 °C, 26 °C, 27 °C 28 °C	Output setpoint value for temperature control.
<i>Minimum valid base setpoint value</i>	10 °C , 11 °C, 12 °C, 13 °C 14 °C, 15 °C, 16 °C, 17 °C 18 °C, 19 °C, 20 °C	Minimum setpoint value (heating). If a base setpoint value received by object 0 is lower than the set value, it will be limited to this value.
<i>Maximum valid base setpoint value</i>	20 °C, 21 °C, 22 °C, 23 °C 24 °C, 25 °C, 27 °C, 30 °C 32 °C	Maximum setpoint value (heating). If a base setpoint value received by object 0 is higher than the set value, it will be limited to this value.
<i>Reduction in standby operation mode (during heating)</i>	0.5 K, 1 K, 1.5 K, 2 K 2.5 K, 3 K, 3.5 K, 4 K	Example: With a base setpoint value of 21°C in heating operation and a 2K reduction, VARIA controls at a setpoint value of $21 - 2 = 19^{\circ}\text{C}$
<i>Reduction at night operation mode (during heating)</i>	3 K , 4 K, 5 K 6 K, 7 K, 8 K	By what value should the temperature be reduced in night mode?
<i>Setpoint value for frost protection mode (during heating)</i>	3 °C, 4 °C, 5 °C 6 °C , 7 °C, 8 °C 9 °C, 10 °C	Preset temperature for frost protection operation in heating mode (Heat protection operation applies in cooling mode).

Continuation:

Designation	Values	Application
<p><i>Manual offset works</i></p>	<p><i>Only in comfort mode</i></p>	<p>In which operation modes can the setpoint value be changed through setpoint value adjustment via object or adjustment on the device (RTR page)?</p> <p>Important: The operation mode-dependent setpoint values in the device remain unchanged (settings menu via  button + settings)</p>
	<p><i>With comfort and standby mode</i></p> <p><i>With comfort, standby and night mode</i></p>	
<p><i>Transmit current setpoint value in cycles</i></p>	<p><i>Not cyclical, only in the event of change</i></p> <p><i>Every 2 min.</i> <i>Every 3 min.</i> <i>Every 5 min.</i> <i>Every 10 min.</i> <i>Every 15 min.</i> <i>Every 20 min.</i> <i>Every 30 min.</i> <i>Every 45 min.</i> <i>Every 60 min.</i></p>	<p>How often should the currently valid setpoint value be sent?</p> <p>Only transmit in the event of a change.</p> <p>Transmit cyclically</p>

3.3.5 Cooling setpoint values parameter page:

Table 18

Designation	Values	Application
<i>Dead zone between heating and cooling</i>	<i>1 K, 2 K, 3 K 4 K, 5 K, 6 K</i>	Specifies the buffer zone between setpoint values in heating and cooling modes. The dead zone is expanded through hysteresis in switching (2 point) control. See glossary: Dead zone
<i>Increase in standby operation (during cooling)</i>	<i>0.5 K, 1 K, 1.5 K 2 K, 2.5 K, 3 K 3.5 K, 4 K</i>	The temperature is increased in standby mode during cooling operation
<i>Increase during night operation (during cooling)</i>	<i>3 K, 4 K, 5 K 6 K, 7 K, 8 K</i>	see above.
<i>Setpoint value for heat protection mode (during cooling)</i>	<i>42 °C i.e. no real heat protection) 29 , 30 , 31 , 32 , 33 °C, 34 °C, 35 °C</i>	Heat protection represents the maximum permitted temperature for the controlled room. It performs the same function during cooling as the frost protection mode during heating, e.g. saves energy while avoiding non-permitted temperatures

3.3.6 Heating control parameter page

Table 19

Designation	Values	Application
<i>Number of heating stages</i>	Only one heating stage <i>Main stage and additional stage</i>	Choice of 1- or 2-stage heating
<i>Type of control</i>	Continuous control <i>2-point control</i>	Important: If this parameter is changed, then all the setpoint values entered on the device will be deleted during download and overwritten with the current ETS values.
<i>Sets the control parameters</i>	Via system type <i>User-defined</i>	Standard application Professional application: P/PI controller set up
<i>System type</i>	Radiator heating <i>Underfloor heating</i>	PI control with: Integrated time = 90 minutes Bandwidth = 2.5 k Integrated time = 180 minutes Bandwidth = 4 k
<i>Transmit heating actuating value in cycles</i>	<i>With change of 1 %</i> <i>With change of 2 %</i> <i>With change of 3 %</i> With change of 5 % <i>With change of 7 %</i> <i>With change of 10 %</i> <i>With change of 15 %</i>	After how much % change* in the control variable is the new value to be sent. Small values increase control accuracy but also the bus load.
<i>Transmit heating actuating value in cycles</i>	<i>Not cyclical, only in the event of change</i> <i>Every 2 min.</i> <i>Every 3 min.</i> <i>Every 5 min.</i> <i>Every 10 min.</i> <i>Every 15 min.</i> <i>Every 20 min.</i> <i>Every 30 min.</i> <i>Every 45 min.</i> Every 60 min.	How often is the current heating actuating value to be sent (regardless of changes)?

* Change since last transmission

Continuation:

Designation	Values	Application
<i>PWM time for heating actuating value</i>	2 min. 3 min. 5 min. 10 min. 15 min. 20 min. 30 min.	An actuation cycle consists of a switch-on and a switch-off process and forms a PWM period. Example: Actuating value= 20%, PWM time = 10 min: In an actuating cycle of 10 min, 2 min switched on and 8 min switched off (i.e. 20% on/ 80% off).
2-point control		
<i>Hysteresis of 2 point control</i>	0.3 K 0.5 K 0.7 K 1 K 1.5 K	Interval between the switch-off point (setpoint value) and the turn back on point (setpoint value – hysteresis). The hysteresis prevents constant switching on/off. Important: If this parameter is changed, then all the setpoint values entered on the device will be deleted during download and overwritten with the current ETS values.
<i>Recirculation of hysteresis after switching point</i>	None 0.1 K/min 0.2 K/min 0.3 K/min	The recirculation causes a gradual decrease in hysteresis over time, and the control accuracy is increased. The hysteresis is equivalent to the programmed value for each switch-off and is gradually reduced by the recirculation process. The hysteresis can reduce to 0 K over prolonged periods of switch-off. At the next switch-on, it is reset to the configured value.

Continuation:

User-defined parameters		
<i>Integrated time of heating control</i>	<i>Pure P control</i> 15 min., 30 min., 45 min. 60 min., 75 min., 90 min. 105 min., 120 min., 135 min. 150 min. , 165 min., 180 min. 195 min., 210 min., 225 min.	Professional setting: See appendix: Response of the PI controller This time can be adapted to suit particular circumstances. If the heating system is over-dimensioned and therefore too fast, shorter values should be used. Conversely, under-dimensioned heating (slow) benefits from longer integrated times.
<i>Proportional band of heating control</i>	1 K, 1.5 K, 2 K , 2.5 K 3 K, 3.5 K, 4 K, 4.5 K 5 K, 5.5 K, 6 K, 6.5 K 7 K, 7.5 K, 8 K, 8.5 K	Professional setting to adapt the control response to the room. Small values cause large changes in control variables, larger values cause finer control variable adjustment. See appendix: Temperature control

3.3.7 Cooling control parameter page

Table 20

Designation	Values	Application
<i>Type of control</i>	<p>Continuous control</p> <p><i>2-point control</i></p>	<p>Infinite control (0 .. 100%).</p> <p>Switching control (On/Off). See appendix: Continuous and switching control</p> <p>Important: If this parameter is changed, then all the setpoint values entered on the device will be deleted during download and overwritten with the current ETS values.</p>
<i>Sets the control parameters</i>	<p><i>Via system type</i></p> <p>User-defined</p>	<p>Standard application</p> <p>Professional application: P/PI controller set up</p>
<i>System type</i>	<p><i>Cooling surface</i></p> <p><i>Fan coil unit</i></p>	<p>PI controller with: Integrated time = 90 minutes Bandwidth = 2 k</p> <p>Integrated time = 180 minutes Bandwidth = 4 k</p>
<i>PWM time for cooling actuating value</i>	<p><i>2 min.</i></p> <p><i>3 min.</i></p> <p>5 min.</p> <p><i>10 min.</i></p> <p><i>15 min.</i></p> <p><i>20 min.</i></p> <p><i>30 min.</i></p>	<p>An actuation cycle consists of a switch-on and a switch-off process and forms a PWM period.</p> <p>Example: Actuating value= 20%, PWM time = 10 min: In an actuating cycle of 10 min, 2 min switched on and 8 min switched off (i.e. 20% on/ 80% off).</p>

Continuation:

Designation	Values	Application
<i>cooling actuating value cyclically</i>	<p>With change of 1 % With change of 2 % With change of 3 % With change of 5 % With change of 7 % With change of 10 % With change of 15 %</p>	<p>After how much % change* in the control variable is the new value to be sent. Small values increase control accuracy but also the bus load.</p>
<i>Sends the cooling control variable in cycles</i>	<p>Not cyclical, only in the event of change 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.</p>	<p>How often is the current cooling control variable to be sent (regardless of changes)?</p>
<i>Switching between heating and cooling</i>	<p>Automatic</p> <p><i>Via object</i></p>	<p>VARIA automatically switches to cooling mode when the actual temperature is above the setpoint value.</p> <p>The cooling mode can only be activated on the bus via object 18 (1= cool). Cooling mode remains off for as long as this object is not set (=0).</p>
<i>Output of the cooling actuating value</i>	<p><i>on separate object (for 4-pipe systems)</i></p> <p><i>In common with heating Heating (2-pipe system)</i></p>	<p>Cooling actuating value is output via object 16 and heating actuating value via object 13. For systems with separate heating and cooling circuits.</p> <p>Both actuating values are sent via object 13. For 2-pipe systems with a valve and seasonal change of medium.</p>

Continuation:

Designation	Values	Application
2-point control		
<i>Hysteresis of 2 wire control for cooling</i>	0.3 K 0.5 K 0.7 K 1 K 1.5 K	Interval between the switch-off point (setpoint value) and the turn back on point (setpoint value – hysteresis). The hysteresis prevents constant switching on/off. Important: If this parameter is changed, then all the setpoint values entered on the device will be deleted during download and overwritten with the current ETS values.
<i>Recirculation of hysteresis after switching point</i>	None 0.1 K/min 0.2 K/min 0.3 K/min	The recirculation causes a gradual decrease in the hysteresis over time, and the control accuracy is increased. The hysteresis is equivalent to the programmed value for each switch-off and is gradually reduced by the recirculation process. The hysteresis can reduce to 0 K over prolonged periods of switch-off. At the next switch-on, it is reset to the configured value.
User-defined parameters		
<i>Proportional band of the cooling control</i>	1 K, 1.5 K, 2 K, 2.5 K 3 K, 3.5 K, 4 K , 4.5 K 5 K, 5.5 K, 6 K, 6.5 K 7 K, 7.5 K, 8 K, 8.5 K	Professional setting to adapt the control response to the room. Small values cause large changes in control variables, larger values cause finer control variable adjustment. See appendix: Temperature control

Continuation:

Designation	Values	Application
<i>Integrated time of the cooling control</i>	<i>Pure P control</i> <i>15 min., 30 min., 45 min.</i> <i>60 min., 75 min., 90 min.</i> <i>105 min., 120 min., 135 min.</i> <i>150 min., 165 min., 180 min.</i> <i>195 min., 210 min., 225 min.</i>	Professional setting: See appendix: Response of the PI controller This time can be adapted to suit particular circumstances. If the cooling system is over-dimensioned and therefore too fast, shorter values should be used. Conversely, under-dimensioned cooling (slow) benefits from longer integrated times.

*Change since last transmission

3.3.8 Additional heating stage parameter page

Table 21

Designation	Values	Application
<i>Type of control</i>	<i>Continuous control</i> <i>2-point control</i>	Infinite control (0 .. 100%). Switching control (On/Off). See appendix: Continuous and switching control
<i>Differential between main stage and additional stage</i>	<i>1 K, 1.5 K, 2 K</i> <i>2.5 K, 3 K, 3.5 K</i> <i>4 K</i>	Specifies the negative interval between the current setpoint value and the setpoint value of the additional stage. Example with basic setpoint value of 21°C and difference of 1K: The main stage controls with the base setpoint value and the addition stage controls with base setpoint value – 1K = 20°C
<i>Proportional band of additional stage</i>	<i>1 K, 1.5 K, 2 K, 2.5 K</i> <i>3 K, 3.5 K, 4 K, 4.5 K</i> <i>5 K, 5.5 K, 6 K, 6.5 K</i> <i>7 K, 7.5 K, 8 K, 8.5 K</i>	With a continuous additional stage, Professional setting to adapt the control response to the room. Large values cause finer changes to the control variables with the same control deviation and more precise control than smaller values.
<i>Transmission of actuating value</i> <i>2. Heating stage</i>	<i>With change of 1 %</i> <i>With change of 2 %</i> <i>With change of 3 %</i> <i>With change of 5 %</i> <i>With change of 7 %</i> <i>With change of 10 %</i> <i>With change of 15 %</i>	After how much % change* in the control variable is the new value to be sent. Small values increase control accuracy but also the bus load.

Continuation:

Designation	Values	Application
<i>Sends the additional heating stage in cycles</i>	<i>Not cyclical, only in the event of change 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.</i>	How often is the current heating actuating value of the additional heating stage to be sent (regardless of changes)?
2-point control		
<i>Hysteresis of 2 wire control for cooling</i>	<i>0.3 K 0.5 K 0.7 K 1 K 1.5 K</i>	Interval between the switch-off point (setpoint value) and the turn back on point (setpoint value – hysteresis). The hysteresis prevents constant switching on/off. Important: If this parameter is changed, then all the setpoint values entered on the device will be deleted during download and overwritten with the current ETS values.
<i>Recirculation of hysteresis after switching point</i>	<i>None 0.1 K/min 0.2 K/min 0.3 K/min</i>	The recirculation causes a gradual decrease in the hysteresis over time, and the control accuracy is increased. The hysteresis is equivalent to the programmed value for each switch-off and is gradually reduced by the recirculation process. The hysteresis can reduce to 0 K over prolonged periods of switch-off. At the next switch-on, it is reset to the configured value.

3.3.9 Actual value parameter page

Table 22

Designation	Values	Application
<i>Function of external actual value</i>	<p><i>not used</i></p> <p><i>Take average with internal actual value</i></p> <p><i>Control actual value</i></p>	<p>VARIA measured and controls room temperature via the internal sensor.</p> <p>VARIA takes an average of the room temperature received from the bus and its own measurements.</p> <p>VARIA solely acquires room temperature via the bus</p>
<i>Calibration value for internal sensor in 1/10 K (-64..63)</i>	<p><i>manual input -64 ... 63</i></p> <p><i>Default value = 0</i></p>	<p>Positive or negative adjustment of measured temperature in 1/10 K increments.</p> <p>Examples: a) VARIA sends 20.3°C. A room temperature of 21.0°C is measured using a calibrated thermometer. In order to increase the temperature of VARIA to 21 °C, “7” (i.e. 7 x 0.1K) must be entered.</p> <p>b) VARIA sends 21.3°C. 20.5°C is measured. In order to reduce the temperature of VARIA to 20.5 °C, “8” (i.e. -8 x 0.1K) must be entered.</p>
<i>transmission of the actual value</i>	<p><i>Not in the event of change</i></p> <p><i>With change of 0.2 K</i></p> <p><i>With change of 0.3 K</i></p> <p><i>With change of 0.5 K</i></p> <p><i>With change of 0.7 K</i></p> <p><i>With change of 1 K</i></p> <p><i>With change of 1.5 K</i></p> <p><i>With change of 2 K</i></p>	<p>Is the current room temperature to be transmitted?</p> <p>If yes, from which minimum change should this be resent?</p> <p>This setting keeps the bus load as low as possible.</p>

Continuation:

Designation	Values	Application
<i>"Actual value malfunction" telegram</i>	<i>always cyclically</i>	Error status is always sent: 1 = Actual value error 0 = No error
	<i>Report cyclically in the event of malfunction only</i>	Error status is only sent if no actual value has been received during the monitoring period.
<i>Transmit "actual value error"</i>	<i>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.</i>	How often should the error status be sent?
Parameter for <i>external actual value</i> object		
<i>Monitoring time for external actual value object</i>	<i>Do not monitor 5 min. 10 min. 15 min. 20 min. 30 min. 45 min. 60 min.</i>	If no actual value is received within the configured period, the <i>response to loss of external actual value</i> parameter setting applies. See below.
<i>Response to failure of external actual value</i> or <i>response prior to reception of first actual value (if monitoring is deactivated)</i>	<i>Control with internal sensor</i> With PI controller: 0% with 2-point controller: Off with PI controller: 10 % with 2-point controller: On with PI controller: 20 % with 2-point controller: On with PI controller: 30 % with 2-point controller: On with PI controller: 50 % with 2-point controller: On	If the external actual value is no longer available or no valid value has been received: Use the internally measured room temperature for control (recommended). Control heating with set actuating value without taking room temperature into account.

Continuation:

Designation	Values	Application
Maximum adjustment	Unlimited +3 K +5 K +7 K	The setpoint value continues to increase in step with the outside temperature. The setpoint value increase ends as soon as the adjustment has achieved the set value.
Cyclical transmission of setpoint adjustment every	<i>Not cyclical, only in the event of change</i> <i>Every 2 min.</i> <i>Every 3 min.</i> <i>Every 5 min.</i> <i>Every 10 min.</i> <i>Every 15 min.</i> <i>Every 20 min.</i> <i>Every 30 min.</i> <i>Every 45 min.</i> <i>Every 60 min.</i>	When should the setpoint value adjustment be sent?

Table 25: Only receive setpoint value adjustment

Designation	Values	Application
<i>Maximum adjustment</i>	<i>Until heating temperature is achieved</i> +3 K +5 K +7 K	The setpoint value must not exceed the heat protection temperature despite adjustment. The setpoint value adjustment must not exceed the set value.

3.3.12 Select display pages parameter page

Table 26

Designation	Values	Application
Show [weather data] page?	Yes No	Should the display page for weather data be used on the device?
Show page 1 for display objects	Yes No	Should the individual display page 1 be displayed? Each individual display page consists of 8 freely programmable lines to show and/or change data.
Show page 2 for display objects	Yes No	See above.
Show page 3 for display objects	Yes No	See above.
Show page 4 for display objects	Yes No	See above.
Show page 5 for display objects	Yes No	See above. Up to a maximum of 5 such pages may be used.
Favourite page (Only VARIA 826)	RTR page Weather data, if page is available Display page 1 if page available Display page 2 if page available ... Display page 5 if page available	Here, the user can select the page that he/she most prefers to display. (see below).
Launch favourites page (Only VARIA 826)	Via object only Via object and after 3 minutes without use	The favourite page can be selected via object 121. It can, for example, be used as an "alarm page" and selected as required. The favourite page can be selected via object 121 and is also automatically displayed if the device is not used for more than three minutes.

3.3.13 Weather data parameter page

Designation	Values	Application
<i>Temperature unit</i>	°C	The temperature is displayed in °C.
<i>Min/max temperature recording</i>	Yes No	Should the maximum and minimum temperature values be stored in the device?
<i>Wind unit</i>	km/h <i>m/s</i> <i>Mph, calculated in m/s</i> <i>Km/h, calculated in m/s</i>	Units for wind speed
<i>Min/max wind recording</i>	Yes No	Should the maximum and minimum wind speed values be stored in the device?
<i>Record rain</i>	Yes No	Should rainfall during the measuring period be recorded?
<i>Resetting min/max values</i>	<p><i>On device:</i></p> <p><i>Via object</i></p> <p><i>On device and via object</i></p> <p><i>On device, via object and daily at 8:00</i></p> <p><i>On device, via object and daily at 12:00</i></p> <p><i>On device, via object and daily at 18:00</i></p> <p><i>On device, via object and daily at 22:00</i></p> <p><i>On device, via object and daily at 0:00</i></p>	<p>How are the stored measurements deleted?</p> <p>By the user on the weather page.</p> <p>By telegram on object 31</p> <p>See above.</p> <p>If the memory is not deleted by telegram or on the device, it is automatically deleted at the set time.</p>

Continuation:

Designation	Values	Application
<i>Display before receipt of value</i>	<p><i>Space</i></p> <p>---</p> <p><i>according to object value after Reset</i></p> <p><i>Read from object via bus</i></p>	<p>What is displayed if no telegrams have been received and the object, therefore, does not have a defined status?</p> <p>The display remains empty.</p> <p>Display 3 dashes.</p> <p>Displays the value last allocated 0 value. Examples: 0 m/s 0.0 °C No rain</p> <p>Varia sends a read command to the allocated object as soon as the line is selected. The display remains empty if no answer is received.</p>

3.3.14 Display objects parameter pages 1..5

Table 27

Designation	Values	Application
<i>Page heading</i> (22)	Manual input	Customer-specific heading for the relevant page. Maximum text length: 22 characters
<i>Favourites line on page</i>	<p><i>No favourite</i></p> <p><i>Line 1</i></p> <p><i>Line 2</i></p> <p><i>Line 3</i></p> <p><i>Line 4</i></p> <p><i>Line 5</i></p> <p><i>Line 6</i></p> <p><i>Line 7</i></p> <p><i>Line 8</i></p>	Determines which line automatically appears as soon as the page is displayed.

3.3.15 Page 1, line 1 to page 5, line 8 parameter pages

VARIA has 5 display pages for individual applications. See accessories:

[Freely programmable display pages.](#)

3.3.15.1 Common parameters

Table 28

Designation	Values	Application
<i>Line format</i>	<i>Entered text</i>	The line should only display one text. (max. 22 characters) and has no other function. An empty line can also be created.
	<i>Object type: Switching</i>	No switching command can be received or sent.
	<i>Object type: Percentage value</i>	A percentage value can be received or sent.
	<i>Object type: HVAC operation mode</i>	An HVAC operation mode can be received or sent.
	<i>Object type: Counter value 0..255</i>	A 1 byte number (e.g. counter reading) can be received or sent.

Value	Operation mode
1	Comfort
2	Standby
3	Night
4	Frost protection/heat protection

Continuation:

Designation	Values	Application							
<i>Line format</i>	<i>Object type: Dimming</i>	Dimmer control with 2 objects: <i>Brighter/darker (4 bit)</i> and <i>On/Off</i>							
	<i>Object type: Temperature</i>	A temperature value can, for example, be sent as a setpoint value for another temperature controller or just the temperature received or displayed via the bus.							
<i>Line format</i>	<i>Object type: EIS 5</i>	A value with commas can be sent or received. Unit used (e.g. °C or m/s etc.) can be selected as required.							
	<i>Object type: Counter value 0..65535</i>	A 2 byte number (e.g. counter reading) can be received or sent.							
	<i>Object type: Scene</i>	Up to 64 scenes can both be displayed and learned							
	<i>Object type: Blinds/shutters</i>	Blinds control with 2 1-bit objects: <i>Up/down</i> and <i>step/stop</i>							
	<i>Object type: Priority</i>	3 priority statuses can be received or sent. <table border="1" data-bbox="986 1440 1404 1682"> <thead> <tr> <th>Function</th> <th>Value</th> </tr> </thead> <tbody> <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> </tbody> </table> Each status can be individually renamed.	Function	Value	Priority inactive (no control)	0 (00 _{bin})	Priority ON (control: enable, on)	3 (11 _{bin})	Priority OFF (control: disable, off)
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})								

Continuation:

Designation	Values	Application
<i>Line format</i>	<p><i>Object type: Display text string</i></p> <p><i>Object type: Valuator</i></p>	<p>A freely chosen 14-character text (14 byte) can be received and displayed from the bus.</p> <p>here, the user can choose from 8 separate predefined values (0..255). Application: E.g. volume control.</p>
<i>Text for line 1..8</i>	Manual input	Enter line description.
<i>Authorise amendment of object value?</i>	<p><i>Yes</i></p> <p><i>No</i></p>	<p>This parameter determines the data orientation for the object allocated to the individual line (see objects 39, 41...)</p> <p>The value/status on the display line can be changed by the user on the device. The changed value is sent to the bus and can be overwritten with received values.</p> <p>The line only displays the received values.</p>
<i>Display before receipt of value</i>	<p><i>Space</i></p> <p>---</p>	<p>What is displayed if no telegrams have been received and the object, therefore, does not have a defined status?</p> <p>The display remains empty</p> <p>Display 3 dashes</p>

3.3.15.2 Specific parameters according to object type

Important: Certain parameters only become visible when the *allow changes to object value?* parameter is set to *yes*.

Certain parameters can be faded out or renamed depending on the setting.

Important:

Text for line is displayed flush left

Unit is always displayed from the 20th position

Table 29

Designation	Values	Application
Switch on object type		
<i>Text at object value = 0</i> (7)	Text entry: Maximum 7 characters	Text to be displayed at <i>Off</i> switching status
<i>Text at object value = 1</i> (7)	Text entry: Maximum 7 characters	Text to be displayed at <i>On</i> switching status
Percentage value object type		
<i>Text at object value = 0</i> (7)	Text entry: Maximum 7 characters	Text to be displayed at 0% value
<i>Increment</i>	1 %, 2 %, , 5 %, 10 % 20 %, 25 %, 33 % 50 %	by what % should the value change at each push of the button (+/-) ?
<i>Lower adjustable threshold value</i>	0 %..100 %	Determines the lowest percentage value that can be set
<i>Upper adjustable threshold value</i>	0 %..100 %	Determines the highest percentage value that can be set
HVAC operation mode object type		
<i>Adjustable operation modes</i>	<i>All operation modes</i> All operation modes except auto <i>Night, standby and comfort</i> <i>Comfort and night only</i> <i>Comfort and standby only</i>	Which operation modes should be available?
Counter value 0..255 object type		
<i>Unit</i>	Text entry: Maximum 3 characters	Abbreviation for the unit that goes with the value, e.g. pcs
<i>Increment</i>	1..255	how much should the value change at each push of the button (+/-) ?
<i>Lower adjustable threshold value</i>	0..255	Determines the lowest value that can be set
<i>Upper adjustable threshold value</i>	0..255	Determines the highest value that can be set

Continuation:

Designation	Values	Application
<i>Lower adjustable scene number</i>	1..64	Determines the number range of the scenes used. Only visible if <i>Allow change of object value ? parameter = yes</i>
<i>Upper adjustable scene number</i>	1..64	
<i>Allocate text to scene number</i>	No, only display number <i>Yes, display text instead of number</i>	Varia only displays the scene numbers The scene numbers are replaced by individual scene names such as e.g. holiday, evening etc... The required scene numbers are entered on the <i>text list</i> parameter page. See appendix: Allot scene numbers text
<i>Name of lower adjustable scene</i>	See text list: Text 1 ... <i>See text list: Text 40</i>	Only if <i>Allow change of object value ? = yes</i> . Which text should be allocated to the lower scene numbers ?
<i>Lowest scene number with text</i>	1..64	Only if <i>Allow change of object value ? = no</i> From which scene number should the scene number be replaced by text? <i>Text list</i> parameter page See appendix: Allot scene numbers text
<i>Text for this scene number</i>	See text list: Text 1 ... <i>See text list: Text 40</i>	Text for the <i>lowest scene number with text</i> entered above

Continuation:

Designation	Values	Application
Object type: Blinds/shutters		
<i>Movement is stopped by</i>	Releasing the key <i>short use or via OK button</i>	The drive operates for as long as the button is pressed or the end position is reached. The drive starts with a long push of the button and can be stopped by briefly pressing the button or by confirming with OK button.
Object type: Priority		
<i>Text at "no priority "</i> (6)	Text entry: Maximum 6 characters	Text to be displayed at <i>no priority</i> status
<i>Text at "priority Off "</i> (6)	Text entry: Maximum 6 characters	Text to be displayed at <i>priority Off</i> status
<i>Text at "priority On"</i> (6)	Text entry: Maximum 6 characters	Text to be displayed at <i>priority On</i> status
Object type: Display text string		
<i>Text adjustment</i>	Flush left <i>1 characters entered flush left</i> <i>2 characters entered flush left</i> <i>3 characters entered flush left</i> <i>4 characters entered flush left</i> <i>5 characters entered flush left</i> <i>6 characters entered flush left</i> <i>7 characters entered flush left</i> <i>8 characters entered flush left</i> Flush right <i>1 characters entered flush right</i> <i>2 characters entered flush right</i> ... <i>7 characters entered flush right</i> <i>8 characters entered flush right</i>	Positioning of the text lines received from the bus on the display.

Continuation:

Designation	Values	Application
Object type: Valuator		
<i>Use which of the following values?</i>	<i>Value 1 only</i> <i>Values 1 and 2</i> <i>Values 1-3</i> <i>Values 1-4</i> <i>Values 1-5</i> <i>Values 1-6</i> <i>Values 1-7</i> <i>Values 1-8</i>	This type of valuator allows individually predefined values to be directly selected and sent at the push of a button (+/-). The number of values to be made available is set here. The enables quick and easy setting as this just leaves the necessary values to choose from.
<i>Value 1</i> <i>Value 2</i> ... <i>Value 7</i> <i>Value 8</i>	Manual input 0 ... 255	Input of required values
<i>Allocate text to values?</i>	<i>No, only display number</i> <i>Yes, display text instead of number</i>	Varia only displays the configured values. Varia sends the configured values and displays the text allocated to each value The required scene numbers are entered on the <i>text list</i> parameter page. See appendix: Allocate text to scene numbers
<i>Text for value 1</i>	<i>See text list: Text 1</i> ... <i>See text list: Text 40</i>	Reference to the text that is to be displayed for the predefined value 1
=> <i>NOTE: Subsequent values</i>	<i>have the subsequent texts</i>	Example: If text 11 is selected for value 1 then value 2 is allocated the following text, i.e. text 12 etc.

3.3.16 Text list parameter page

Table 30

Designation	Values	Application
Text 1 (10) ... Text 40 (10)	Text entry: Maximum 10 characters	The entered texts can replace values or scene numbers from the page 1..5, lines 1..8 parameter page.

3.3.17 Switching program channel 1 (for RTR) parameter page

Table 31

Designation	Values	Application
<i>Name of channel</i>	manual input (max. 8 characters)	Input of description for channel 1 (e.g. heating)
<i>Type of switching program</i>	<i>HVAC operation mode</i>	Channel 1 is exclusively designed for controlling HVAC operation modes and is internally linked to the room temperature controller.
<i>Switching program after download</i>	<p><i>Unchanged</i></p> <p>Program 1</p> <p><i>Program 2</i></p> <p>Program 3</p> <p><i>Own program</i></p> <p><i>No program</i></p>	<p>Which program is to be active after downloading in VARIA? The program that was active before the download should continue.</p> <p>Mon - Fri: 6:00 – 22:00 Comfort Mon - Fri: 22:00 – 6:00 Night Sat, Sun: 8:00 – 23:00 Comfort Sat, Sun: 23:00 – 8:00 Night Mon - Fri: 6:00 – 8:00 Comfort Mon - Fri: 8:00 – 17:00 Night Mon - Fri: 17:00 – 22:00 Comfort Mon - Fri: 22:00 – 6:00 Night Sat, Sun: 8:00 – 23:00 Comfort Sat, Sun: 23:00 – 8:00 Night Mon - Fri: 6:00 – 8:00 Comfort Mon - Fri: 8:00 – 12:00 Standby Mon - Fri: 12:00– 22:00 Comfort Mon - Fri: 22:00 – 6:00 Night Sat, Sun: 8:00 – 23:00 Comfort Sat, Sun: 23:00 – 8:00 Night</p> <p>The programs entered on the device by the user are valid.* Channel 1 is completely deactivated.</p>

Continuation:

Designation	Values	Application
<i>Change switching program via user</i>	<i>Disabled</i> <i>Enabled</i>	Can the user switch the switching program to channel 1?
<i>Response after unlocking</i>	<i>Operation mode of switching program starts immediately</i> <i>Operation mode functions after next switching program change</i>	As soon as the channel is unlocked the RTR takes up the prescribed operation mode from the switching program. No reaction when cancelling the lock. These are only taken up by the RTR if the channel switches to another operation mode based on a switching program.
<i>Transmit switching program cyclically (if used)</i>	Not cyclical, only in the event of change <i>Every 2 min.</i> <i>Every 3 min.</i> <i>Every 5 min.</i> <i>Every 10 min.</i> <i>Every 15 min.</i> <i>Every 20 min.</i> <i>Every 30 min.</i> <i>Every 45 min.</i> <i>Every 60 min.</i>	When is the status of the switching program sent from channel 1?

* If the own program is selected via the *switching program after download* it is not lost but instead can be reactivated at any time.

3.3.18 Switching program channel 2..8 parameter pages

Table 32

Designation	Values	Application
<i>Name of channel</i>	manual input (max. 8 characters)	Input of description for channel (e.g. "light 1")
<i>Type of switching program</i>	<i>HVAC operation mode</i>	The channel can transmit up to 3 different statuses: Comfort, standby and night operation , i.e. stage 1, 2 and 3 (input on device).
	<i>On/Off</i>	The channel can only transmit two statuses; On and Off
	<i>Valuator</i>	The channel can transmit up to 3 different 1-byte values (0..255).
	<i>Percentage value</i>	The channel can transmit up to 3 different percentage values (0..100%).
	<i>Temperature in °C</i>	The channel can transmit up to 3 different temperature values. Example: Setpoint values for a thermostat.
	<i>Temperature in K</i>	The channel can transmit up to 3 different temperature differential values. Example: Temperature decrease or increase for a thermostat.

Continuation:

Designation	Values	Application
<p><i>Switching program after download</i></p>	<p><i>Unchanged</i></p> <p><i>Program 1</i></p>	<p>Which program is to be active after downloading?</p> <p>The program that was active before the download should continue.</p> <p>Mon - Fri: 6:00 – 22:00 On or stage 3 Mon - Fri: 22:00 – 6:00 Off or stage 1 Sat, Sun: 8:00 – 23:00 On or stage 3 Sat, Sun: 23:00 – 8:00 Off</p>
	<p><i>Program 2</i></p>	<p>Mon - Fri: 6:00 – 8:00 On or stage 3 Mon - Fri: 8:00 – 17:00 Off or stage 1 Mon - Fri: 17:00– 22:00 On or stage 3 Mon - Fri: 22:00 – 6:00 Off or stage 1 Sat, Sun: 8:00 – 23:00 On or stage 3 Sat, Sun: 23:00 – 8:00 Off or stage 1</p>
<p><i>Switching program after download</i></p>	<p><i>Program 3</i></p> <p><i>Own program</i></p> <p><i>No program</i></p>	<p>Mon - Fri: 6:00 – 8:00 On or stage 3 Mon - Fri: 8:00 – 12:00 On or stage 2 Mon - Fri: 12:00 – 22:00 On or stage 3 Mon - Fri: 22:00 – 6:00 Off or stage 1 Sat, Sun: 8:00 – 23:00 On or stage 3 Sat, Sun: 23:00 – 8:00 Off or stage 1</p> <p>The programs entered on the device by the user are valid.*</p> <p>Channel is completely deactivated.</p>

Continuation:


Designation	Values	Application
<i>Change switching program via user</i>	<i>Disabled</i> <i>Enabled</i>	Can the user change the switching program?
<i>Response after unlocking</i>	<i>Only transmit status after next change</i> <i>Immediately transmit current status</i>	Only transmit when the channel status changes. Important: If <i>transmit cyclically</i> is selected, cyclic sending is only active after next change. The channel status is sent immediately as soon as the lock is cancelled.
<i>Transmit switching program cyclically (if used)</i>	<i>Not cyclical, only in the event of change</i> <i>Every 2 min.</i> <i>Every 3 min.</i> <i>Every 5 min.</i> <i>Every 10 min.</i> <i>Every 15 min.</i> <i>Every 20 min.</i> <i>Every 30 min.</i> <i>Every 45 min.</i> <i>Every 60 min.</i>	When should the status of the channel be sent?

* If the own program is selected via the *switching program after download* it is not lost but instead can be reactivated at any time.

4 Start-up

4.1 Activate program mode


The program mode can be motivated in 2 different ways.

- Move a magnet along the right upper side of the device
- In the settings menu , in the "system" line → select "Prog Mode" and set to *active* using the + button.


The LED on the right upper side of the device lights up and the device can be programmed

After the device has been programmed for the first time, the settings menu can be selected without entering the PIN.

4.2 Settings menu

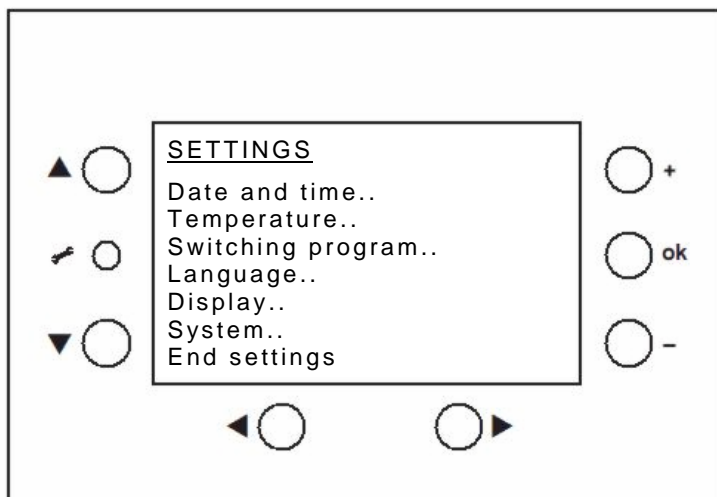
The *SETTINGS* menu is opened using the -button.
A PIN code may be required depending on configuration.

4.2.1 PIN code

If PIN code protection is configured (*General, settings menu on device = released by PIN*) pressing the -button reveals the PIN entry **PIN 5555** in the display and the first space is blacked out.

Select the right number using the +/- buttons and confirm with OK.
Every time the button is pressed the next entry space is automatically selected.

The settings menu appears after the last position has been completed and confirmed.



4.2.2 Date and time

Select the line to be changed with the ▼▲ buttons.

Press OK: The value to be changed is blacked out.

Use +/- to change the value and move to the next value by pressing OK.

4.2.3 Temperature

Individual setpoint values for the different operation modes can be entered here.

Room temperature If the installation location is unsuitable for measuring room temperature this can be corrected here.



Setpoint value in comfort mode (16 °C to 28 °C)



Setpoint value in standby mode (maximum of 5 K lower than in comfort mode)



Setpoint value in night operation mode (maximum of 8 K lower than in comfort mode)

Advice on entering setpoint values:

The night operation setpoint value must be lower than the setpoint value for comfort mode.

Table 33: Setting ranges

Operation mode	Setting range
Standby	Comfort heating – 0..5 K
Night	Comfort heating – 3.0.8 K
Comfort in cooling mode	Comfort heating + dead zone*

* Dead zone = 1..6 K

Non-permitted values are automatically corrected if required. Here, the ETS threshold parameter is taken into consideration, i.e. both *minimum* and *maximum valid setpoint value* as well as the *setpoint value for frost protection mode*.

Example:

Heating setpoint value = 20 °C, night 14 °C

If the heating setpoint value is increased to 24 °C , then the setpoint value in night mode changes automatically to 16 °C, as a maximum reduction of 8 K is permissible in night operation mode (24 °C – 8 K = 16 °C).

See table above: Setting ranges.

4.2.4 Switching program

There are 8 channels (switching programs) available.

Both customer-specific and preset switching programs can be selected.

The programs are weekly programs with a minimum time interval of 15 minutes.

Programming is completed on the device. ETS is only used to determine whether and which programs are active.

Channel 1 is internally linked to the temperature controller and controls the operation modes.

The current channel status is reported back to object 10.

See [switching program channel 1 \(for RTR\) parameter page](#).

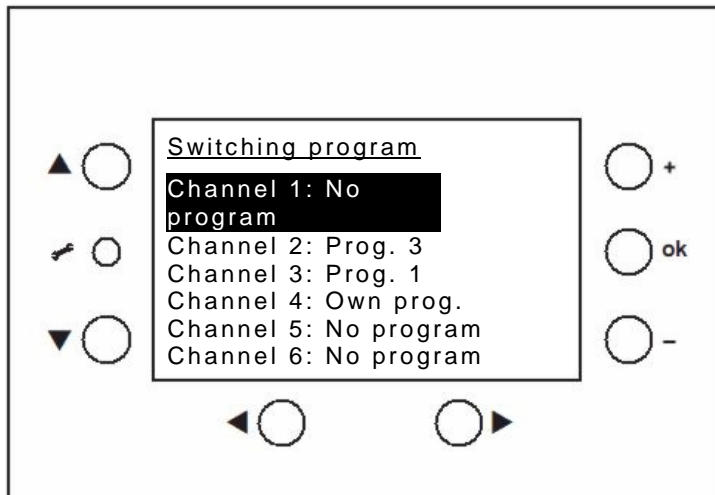
Channels 2 to 8 can transmit all types of telegrams to the bus.

2 or 3 operation modes/values can be sent depending on the configuration.

See [The switching program channel 2..8](#).

4.2.4.1 Switching program overview page

Move cursor with the help of ▼ ▲ buttons to **switching program** and confirm with OK
This page is used to display switching programs for each channel.



Programs 1-3 are fixed preset programs for heating applications.
Fixed means they cannot be easily changed.

It is, however, possible to copy them on channels with an own program and use as a template.

The +/- buttons can be used in each channel to select from 5 program options:

- Program 1
- Program 2
- Program 3
- Own program
- No program

Depending on the ETS setting (*type of switching program*) these programs function as

- 3 stage,
- 2 stage or
- HVAC programs.

For channel 1 the *type of switching program* = *HVAC operation mode* is unchangeable

3-stage programs are possible with: percentage value, valuator, temperature in °C and temperature differential in K.

3 different values can be sent during the course of a day.

Table 34: Program options depending on selected *type of switching program* (ETS).

	Switching times	<i>Type of switching program</i>		
		HVAC	On/Off	3 steps
Program 1	Mon - Fri: 6:00 – 22:00	Comfort	On	Stage 3
	Mon - Fri: 22:00 – 6:00	Night	Off	Stage 1
	Sat, Sun: 8:00 – 23:00	Comfort	On	Stage 3
	Sat, Sun: 23:00 – 8:00	Night	Off	Stage 1
Program 2	Mon - Fri: 6:00 – 8:00	Comfort	On	Stage 3
	Mon-Fri: 8:00 – 17:00	Night	Off	Stage 1
	Mon - Fri: 17:00– 22:00	Comfort	On	Stage 3
	Mon - Fri: 22:00 – 6:00	Night	Off	Stage 1
	Sat, Sun: 8:00 – 23:00	Comfort	On	Stage 3
	Sat, Sun: 23:00 – 8:00	Night	Off	Stage 1
Program 3	Mon - Fri: 6:00 – 8:00	Comfort	On	Stage 3
	Mon - Fri: 8:00 – 12:00	Standby	Off	Stage 2
	Mon - Fri: 12:00– 22:00	Comfort	On	Stage 3
	Mon - Fri: 22:00 – 6:00	Night	Off	Stage 1
	Sat, Sun: 8:00 – 23:00	Comfort	On	Stage 3
	Sat, Sun: 23:00 – 8:00	Night	Off	Stage 1
Own program	The programs entered on the device by the user are valid.*			
No program	Channel 1 is completely deactivated.			

* If the own program is selected via the *switching program after download* it is not lost but instead can be reactivated at any time.

Special case:

Switch existing 3 stage *switching program* with the ETS to On/Off program .

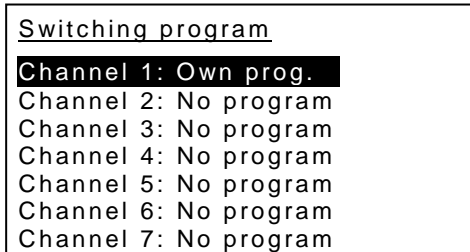
The device has a switching program with 3 stages and type of program is reconfigured to a 2 stage program.

Stages 1 and 2 are combined.

Table 35: Conversion from 3 to 2 stages

Previously: 3 stage program	After: On/Off program
Stage 1	Off
Stage 2	
Stage 3	On

4.2.4.2 Display, enter or change programs



Use the ▼ ▲ buttons on the overview page to select channel and press OK
 An overview page appears for the selected channel (except for "no program").

Set the day of the week with the +/- buttons.

The associated program is displayed on the screen.

By leafing through with +/- to the weekday you can get a quick overview of the whole week.

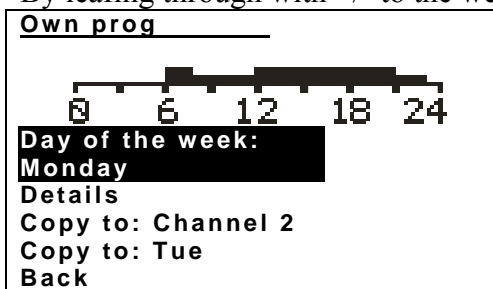
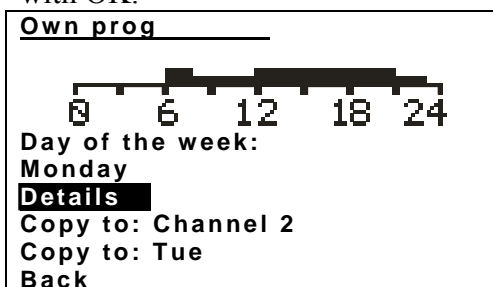


Table 36: Representation of switching statuses on the time bar

Time bar	Type of switching program		
	HVAC	On/Off	3 steps
	Night	Off	1
	Standby		2
	Comfort	On	3

For a more detailed view of the program or to change own program, select details and confirm with OK.

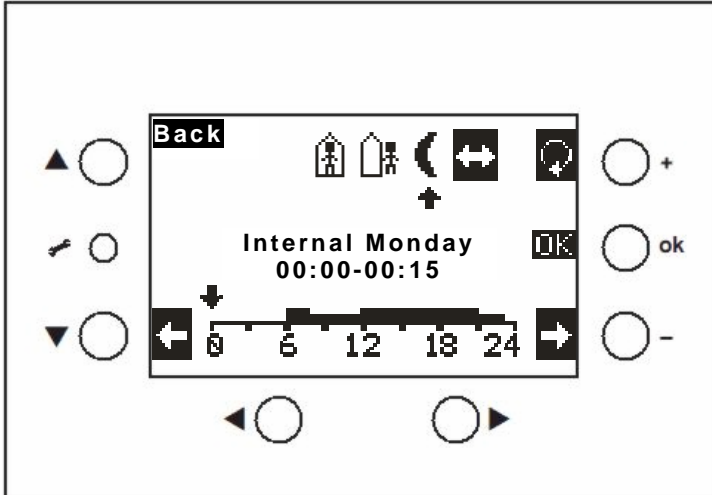


The buttons have new functions in the detailed view.

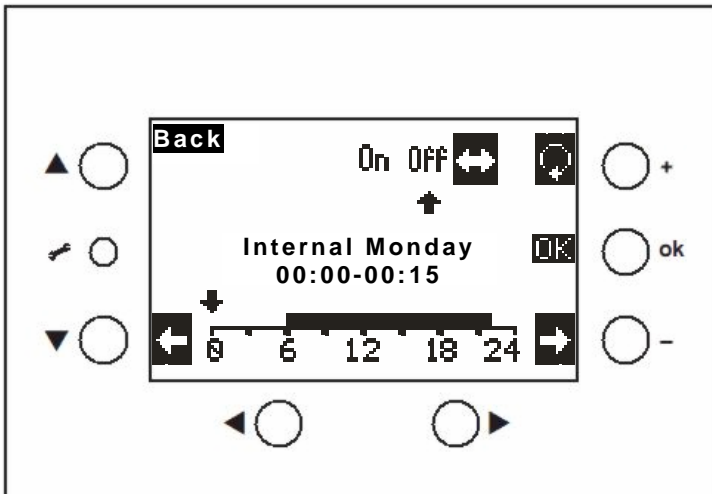
These are shown as symbols on the display next to the relevant buttons.

The cursor \blacktriangledown above the time bar points to the selected 15 minute segment.

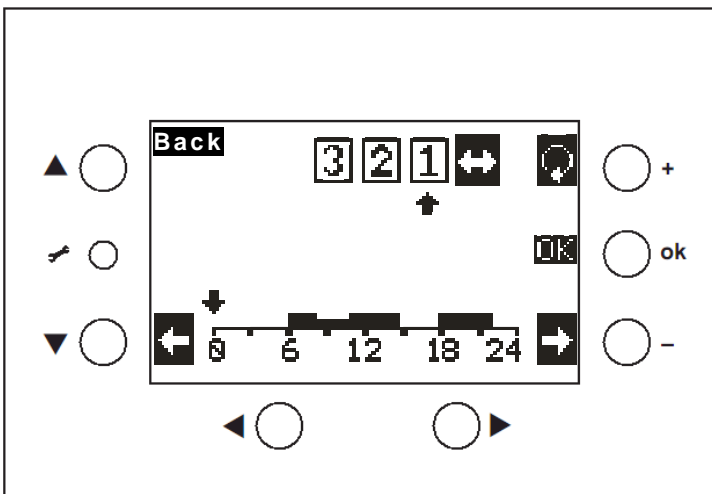
The up arrow \blacktriangle shows the associated status.



Type of switching program: HVAC



Type of switching program: On/Off



Type of switching program: 3 steps

Table 37: Button symbols

























Button	Symbol	Function of the key
+		Select operation mode: Current cursor function is displayed by the arrow  : See next table.
▼		Move the program cursor left and program the desired status with the  button
-		Move the program cursor right and program the desired status with the  button
▲	Back	Leave detailed view


Table 38: Select the cursor functions via the  button.



Button	Function	
	The cursor can be moved over the time bar without changing the program and the Current operating mode is shown by an arrow  on the top right. The corresponding time span is blended in above the time bar (e.g. 06:00 - 06:15).	
	The cursor  programs the "night" operation mode.	
	The cursor  programs the "standby" operation mode.	
	The cursor  programs the "comfort" operation mode.	
On	The cursor  programs the switch-on time	On/Off
Off	The cursor  programs the switch-off time	
1	The cursor  programs stage 1	Percentage value Valuator Temperature in °C Temperature difference in K See Switching program channel 2..8 parameter pages .
2	The cursor  programs stage 2	
3	The cursor  programs stage 3	

Program entry:

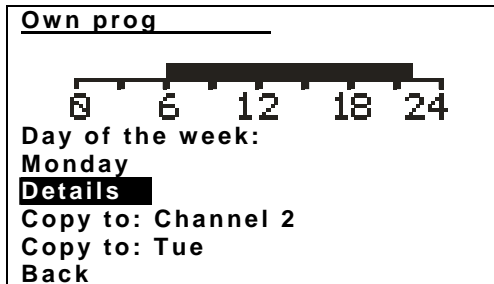
The symbol  is blacked out : With the help of the arrows the cursor can   can be moved to the desired position (time) for programming.

Select the desired status (or stage) via the  button and this has a black background.

Use the  button to move the cursor, the status is accepted.

The  button can be used at anytime to select another status or the  symbol used to deactivate the selection.

After programming is completed, press OK.




The "copy to weekday" function

Use +/- to select weekday and confirm with OK.
 The day program displayed in the graphics is copied to the selected weekday of the same channel

The "copy to channel n"

Use +/- to select desired channel and confirm with OK.
 All weekdays are copied to the selected channel.

4.2.5 Language

Use ▼ ▲ buttons to select desired language for VARIA and confirm with OK.
 Use  and OK to leave menu.

4.2.6 Display

Table 39

Menu item	Description
Button sound	What does a beep signify on pressing the buttons?
Button light	If the display backlighting should come on for 30 seconds when the buttons are pressed?
Max. brightness	Controls brightness if display lighting with push of a button. (0-100%)

4.2.7 System

Menu item	Description
Prog. mode	With this function, the programming LED can be switched on with the +/- buttons and the device programmed with the ETS.
Phys. address	The current physical address of the device is displayed
SW:	Data for diagnostic purposes
S/N:	
FD:	

4.3 Use of freely programmable display pages

The value or status can only be changed if the *changing the object value* parameter is set to *yes*.

Otherwise, values and statuses can only be displayed.


Only the amendable lines can be selected using the ▼ ▲ buttons; the others are missed out.

<i>Line format</i>	<i>Permit changing object value</i> parameter	
	Yes	No
<i>Entered text</i>	Does not require operation as only text is displayed.	
<i>Object type: Switching</i>	The switching status is selected using the + / - buttons	Received switching status is displayed
<i>Object type: Percentage value</i>	The percentage value is set using the + / - buttons and confirmed with OK	Received percentage value is displayed
<i>Object type: HVAC operation mode</i>	The desired operation mode is set using the + / - buttons and confirmed with OK	Received operation mode is displayed
<i>Object type: Counter value 0..255</i>	The desired value is set using the + / - buttons and confirmed with OK	Received value is displayed
<i>Object type: Dimming</i>	Briefly press button: + key = switch on - key = switch on The reaction if the button is pressed longer depends on setting of the stopping the dimmer process parameter.	
<i>Object type: Temperature</i>	The desired temperature (e.g. setting point for a thermostat) mode is set using the + / - buttons and confirmed with OK	Received temperature is displayed
<i>Object type: EIS 5</i>	The desired value is set using the + / - buttons and confirmed with OK	Received value is displayed
<i>Object type: Counter value 0..65535</i>	The desired value is set using the + / - buttons and confirmed with OK	Received value is displayed
<i>Object type: Scene</i>	The desired scene is set using the + / - buttons and confirmed with OK	Received scene number or associated text is displayed

Continuation:

<i>Line format</i>	Permit <i>changing object value</i> parameter	
	Yes	No
<i>Object type: Blinds/shutters</i>	Briefly press button: + key = step up or stop + key = step down or stop The reaction if the button is pressed longer depends on setting of the stop movement by parameter.	
<i>Object type: Priority</i>	The desired priority is set using the + / - buttons and confirmed with OK	Received priority mode is displayed
<i>Object type: Display text string</i>	No operation required. A 14 character text is received and displayed from each line object.	
<i>Object type: Valuator</i>	The +/- buttons can be used to select up to 8 predefined values or associated texts	Display value or associated text

4.4 Troubleshooting

Response	Potential causes	Remedy
Display backlighting flashes*, LCD display is empty.	Download was interrupted or not completed	1. Bus voltage interrupted 2. press down and hold  and OK button simultaneously 3. Reconnect bus voltage 4. Release buttons 5. Download ETS application program again.

*only flashes if mains supply available.

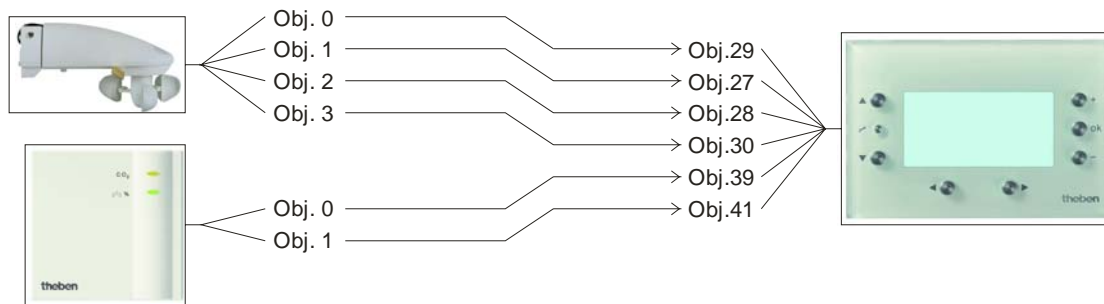
5 Typical applications:

5.1 Display weather data and air quality

5.1.1 Devices:

- VARIA 824 / 826 (824 9 200 / 826 9 200)
- Amun 716 (716 9 200)
- Weather station (132 9 201)

5.1.2 Overview



1

Figure

5.1.3 Objects and links

Table 40

No.	Weather station	No.	VARIA	Comments
	Object name		Object name	
0	<i>Brightness value</i>	29	<i>Brightness</i>	Display on the weather page
1	<i>Temperature value</i>	27	<i>Outside temperature</i>	Display on the weather page
2	<i>Wind speed</i>	28	<i>Wind speed</i>	Display on the weather page
3	<i>Rain sensor</i>	30	<i>Rain</i>	Display on the weather page

Table 41

No.	Amun 716	No.	VARIA	Comments
	Object name		Object name	
0	<i>CO2 value</i>	39	<i>Display page 1, line 1 - EIS 5 value</i>	Display on freely programmable pages
1	<i>relative humidity</i>	41	<i>Display page 1, line 2 - percentage value</i>	Display on freely programmable pages

5.1.4 Important parameter settings

The standard parameter settings apply for unlisted parameters.

Table 42: VARIA

Parameter page	Parameters	Setting
<i>Select display pages</i>	<i>Show [weather data] page?</i>	<i>Yes</i>
	<i>Show page 1 for display objects</i>	<i>Yes</i>
<i>Weather data</i>	<i>Wind unit</i>	<i>km/h</i>
<i>Page 1 line 1</i>	<i>Line format</i>	<i>Object type: EIS 5</i>
	<i>Text for line 1 (11)</i>	<i>CO2 value</i>
	<i>Display object unit (3)</i>	<i>ppm</i>
	<i>Authorise amendment of object value?</i>	<i>No</i>
<i>Page 1 line 2</i>	<i>Line format</i>	<i>Object type: Percentage value</i>
	<i>Text for line 3 (14)</i>	<i>Relative humidity</i>
	<i>Authorise amendment of object value?</i>	<i>No</i>

Table 43: Weather station

Parameter page	Parameters	Setting
<i>Measurements</i>	<i>Transmit wind speed in the event of a change of ...</i>	<i>20 %, but at least 1 m/s</i>
	<i>Transmit wind speed in</i>	<i>km/h</i>
	<i>Transmit wind speed cyclically</i>	<i>every 10 minutes</i>
	<i>Transmit brightness value in the event of a change in ...</i>	<i>30 %, but at least 1 lx</i>
	<i>Transmit brightness value cyclically</i>	<i>every 10 minutes</i>
	<i>Transmit temperature in the event of change of</i>	<i>1 °C</i>
	<i>Transmit temperature cyclically</i>	<i>every 10 minutes</i>
	<i>Transmit rain in the event of change and</i>	<i>every 10 minutes</i>
	<i>Off-delay</i>	<i>None</i>

Table 44: Amun 716

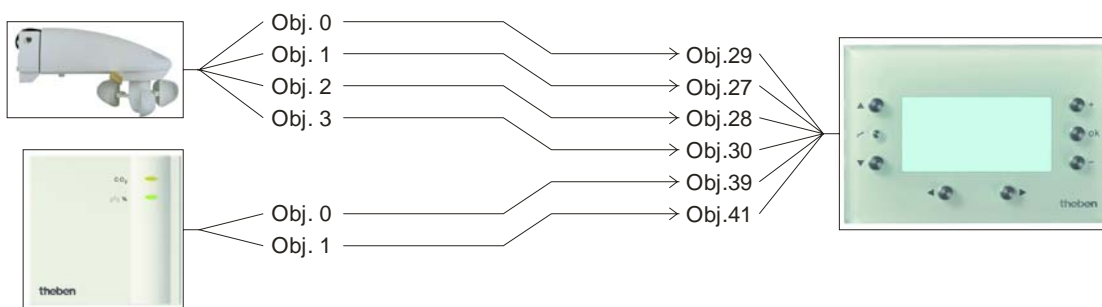
Parameter page	Parameters	Setting
<i>Measured values</i>	<i>Transmit CO2 content on change of</i>	<i>200 ppm</i>
	<i>Transmit CO2 content cyclically</i>	<i>every 10 minutes</i>
	<i>Transmit humidity value in the event of a change in ...</i>	<i>2 %</i>
	<i>Transmit humidity value cyclically</i>	<i>every 10 minutes</i>

5.2 Winter garden control

5.2.1 Devices:

- VARIA 824 / 826 (824 9 200 / 826 9 200)
- Amun 716 (716 9 200)
- Weather station (132 9 201)

5.2.2 Overview



Figure

2

5.2.3 Objects and links

Table 45

No.	Weather station	No.	VARIA	Comments
	Object name		Object name	
0	<i>Brightness value</i>	29	<i>Brightness</i>	Display on the weather page
1	<i>Temperature value</i>	27	<i>Outside temperature</i>	Display on the weather page
2	<i>Wind speed</i>	28	<i>Wind speed</i>	Display on the weather page
3	<i>Rain sensor</i>	30	<i>Rain</i>	Display on the weather page

Table 46

No.	Amun 716	No.	VARIA	Comments
	Object name		Object name	
0	<i>CO2 value</i>	39	<i>Display page 1, line 1 - EIS 5 value</i>	Display on freely programmable pages
1	<i>relative humidity</i>	41	<i>Display page 1, line 2 - percentage value</i>	Display on freely programmable pages

5.2.4 Important parameter settings

The standard parameter settings apply for unlisted parameters.

Table 47: VARIA

Parameter page	Parameters	Setting
<i>Select display pages</i>	<i>Show [weather data] page?</i>	<i>Yes</i>
	<i>Show page 1 for display objects</i>	<i>Yes</i>
<i>Weather data</i>	<i>Wind unit</i>	<i>km/h</i>
<i>Page 1 line 1</i>	<i>Line format</i>	<i>Object type: EIS 5</i>
	<i>Text for line 1 (11)</i>	<i>CO2 value</i>
	<i>Display object unit (3)</i>	<i>ppm</i>
	<i>Authorise amendment of object value?</i>	<i>No</i>
<i>Page 1 line 2</i>	<i>Line format</i>	<i>Object type: Percentage value</i>
	<i>Text for line 3 (14)</i>	<i>Relative humidity</i>
	<i>Authorise amendment of object value?</i>	<i>No</i>

Table 48: Weather station

Parameter page	Parameters	Setting
<i>Measurements</i>	<i>Transmit wind speed in the event of a change of ...</i>	<i>20 %, but at least 1 m/s</i>
	<i>Transmit wind speed in</i>	<i>km/h</i>
	<i>Transmit wind speed cyclically</i>	<i>every 10 minutes</i>
	<i>Transmit brightness value in the event of a change in ...</i>	<i>30 %, but at least 1 lx</i>
	<i>Transmit brightness value cyclically</i>	<i>every 10 minutes</i>
	<i>Transmit temperature in the event of change of</i>	<i>1 °C</i>
	<i>Transmit temperature cyclically</i>	<i>every 10 minutes</i>
	<i>Transmit rain in the event of change and</i>	<i>every 10 minutes</i>
	<i>Off-delay</i>	<i>None</i>

Table 49: Amun 716

Parameter page	Parameters	Setting
<i>Measured values</i>	<i>Transmit CO2 content on change of</i>	<i>200 ppm</i>
	<i>Transmit CO2 content cyclically</i>	<i>every 10 minutes</i>
	<i>Transmit humidity value in the event of a change in ...</i>	<i>2 %</i>
	<i>Transmit humidity value cyclically</i>	<i>every 10 minutes</i>

5.3 Heating control, basic configuration

Varia controls a Cheops actuator.

A window contact, on a TA 2 binary input sends the window status.

5.3.1 Devices:

- VARIA 824 / 826 (824 9 200 / 826 9 200)
- Cheops drive (order no. 731 9 200)
- TA 2 (order no. 496 9 202)

5.3.2 Overview

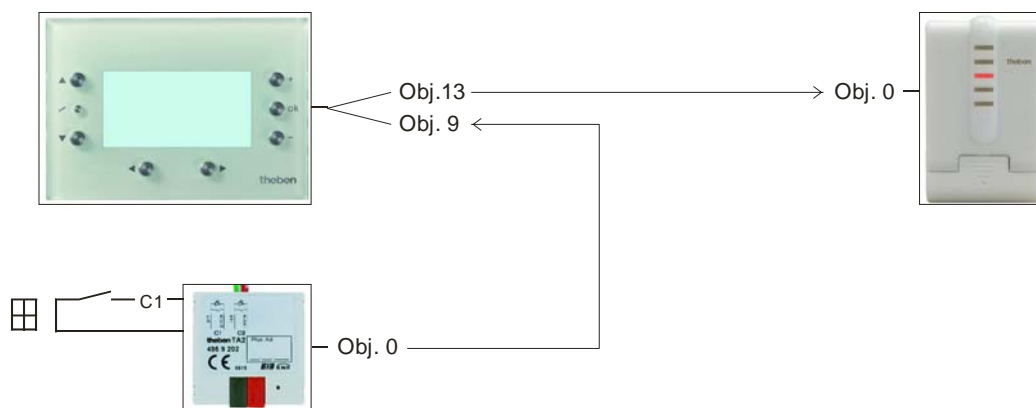


Figure 3

5.3.3 Objects and links

Table 50

No.	VARIA	No.	Cheops drive	Comments
	Object name		Object name	
13	<i>Heating actuating value %</i>	0	<i>Control variable</i>	RTR output actuator

Table 51

No.	TA 2	No.	VARIA	Comments
	Object name		Object name	
0	<i>Channel 1 switching</i>	9	<i>Window state</i>	Input for window contact

5.3.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

5.3.4.1 Varia

Table 52

Parameter page	Parameters	Setting
<i>RTR setting</i>	<i>Control</i>	<i>Heating control only</i>
	<i>Objects to select operating mode</i>	<i>New: Operation mode, presence, window status</i>

5.3.4.2 TA 2

Table 53

Parameter page	Parameters	Setting
<i>Channel 2</i>	<i>Channel function</i>	<i>Switch/key</i>
	<i>Debounce time</i>	<i>100 ms</i>
	<i>Object type</i>	<i>Switching (1-bit)</i>
	<i>Response to rising edge</i>	<i>ON (OFF*)</i>
	<i>Response to falling edge</i>	<i>OFF(ON*)</i>
	<i>Response after restoration of the bus supply</i>	<i>update</i>

* Depending on type of window contact. The details in brackets refer to the following:
 Window closed → Contact closed

5.3.4.3 Cheops drive

The standard parameter settings can be used here.

6 Appendix

6.1 Fan forced mode

This function enables the manual selection of fan stage on the RTR display page of device. The fan coil actuator or the fan control is moved into forced mode. Select fan symbol using the arrow keys ▲/▼ and use the +/- buttons to set desired fan stage.

Table 54: Button operation (+/-)

Button push	Function	Display
1	Fan off	OFF
2	Fan stage 1	1
3	Fan stage 2	2
4	Fan stage 3	3
5	Auto	Auto

Important: Depending on the actuator used, either 1 or 0 is needed to trigger forced operation.

This response is adjustable, see *switch fan between auto and forced* parameter on the *fan stages* parameter page.

Transmit response in forced mode with fan coil actuator FCA 1 (forced = 1):

Object 23 sends 1 to the fan coil actuator thereby triggering forced mode.

Object 22 sends the control variable for the selected fan stage in accordance with the set threshold value.

This control variable (in accordance with the set threshold value) is transferred to the fan coil actuator as a fan stage between 0 and 3.

Important: the sent forced control variable should always be higher than the threshold setting of the fan coil actuator.

Example:

Threshold value for Fan stage	Set values for VARIA	Recommended values for FCA 1
1	20 %	10 %
2	50 %	40 %
3	80 %	70 %

If fan stage 2 is selected using the button, object 16 sends control variable 50 %.

As the threshold value for stage 2 in the fan coil actuator is set at 40 % , the received control variable of 50 % is clearly allocated to fan stage 2 and accepted by the fan.

6.2 PWM cycle

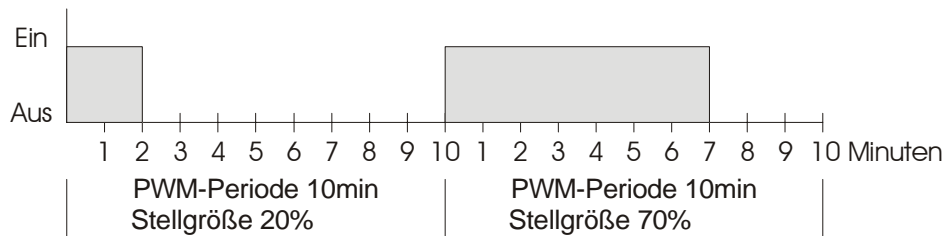
6.2.1 Basic principle

The 50% control variable is converted into switch-on/switch-off cycles in order to achieve a heating output of 50%.

The actuator is switched on for 50% of the time and switched off for 50% of the time over a fixed period (10 minutes in our example).

Example:

Two different switch-on times of 2 and 7 minutes indicate conversion of 2 different control variables, namely 20% and 70%, into a PWM period of 10 minutes.



6.2.2 Response to changes in the control variable

Every change in the control variable is immediately transferred to the PWM cycle in order to respond to changes in the quickest possible time.

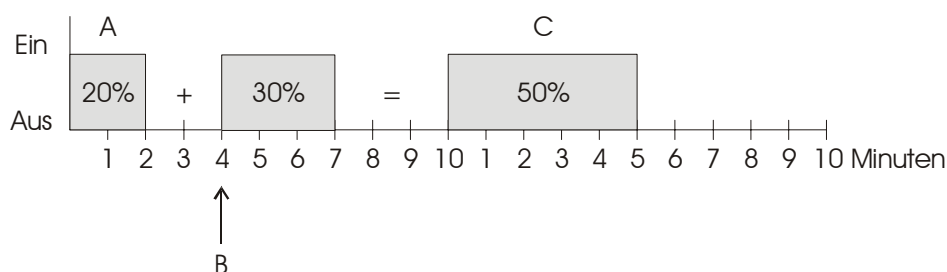
Example 1:

The last control variable was 20% (A).

A new control variable of 50% is received during the cycle (B).

The output is immediately switched on and the missing 30% switch-on time is added

The next cycle is executed with 50% (C).

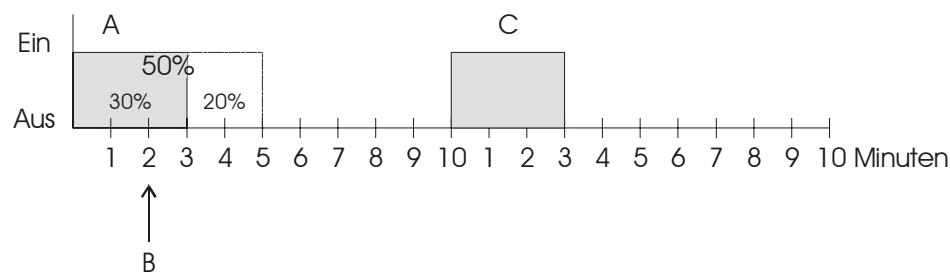


Example 2:

The last control variable was 50% (A)

A new control variable of 30% is received during the cycle (B).

The output is switched off after completing 30% of the PWM and thus the new control variable is executed.



Note:

If the rated switch-on time for the current cycle has already exceeded while receiving the new control variable, the output is immediately switched off and the new control variable is executed during the next cycle.

6.3 Operation mode scene

6.3.1 Principle

The Current operating mode can be saved with the scene functions and restored later at any time.

The Current operating mode is allocated to the appropriate scene number when a scene is saved.

The previously saved operation mode is reactivated when a scene number is called.

This allows RAM 712 to be easily associated to each chosen user scene.

VARIA can participate in up to 16 scenes.

The scenes are permanently stored and remain intact even after the application has been downloaded again.

6.3.2 Saving scenes:

The appropriate storage code is sent to object 20 to save a scene.

Table 55

Scene no.	Storage code	
	Hex	Dec
1	\$80	128
2	\$81	129
3	\$82	130
4	\$83	131
5	\$84	132
6	\$85	133
7	\$86	134
8	\$87	135
9	\$88	136
10	\$89	137
11	\$8A	138
12	\$8B	139
13	\$8C	140
14	\$8D	141
15	\$8E	142
16	\$8F	143

Example:

Save Current operating mode with scene 5:
→ \$84 transmit to obj. 20.

6.3.3 Calling scenes:

The appropriate retrieval code is sent to object 20 to call a scene.

Table 56

Scene no.	Retrieval code	
	Hex	Dec
1	\$00	0
2	\$01	1
3	\$02	2
4	\$03	3
5	\$04	4
6	\$05	5
7	\$06	6
8	\$07	7
9	\$08	8
10	\$09	9
11	\$0A	10
12	\$0B	11
13	\$0C	12
14	\$0D	13
15	\$0E	14
16	\$0F	15

Example:

Call operation mode with scene 5:
→ \$04 transmit to obj. 20.

6.4 Create and display scene telegrams

Varia can transmit and display 1..5 scene telegrams on the user-specific display pages. These can also be sent, if necessary, by a common group address to object 20 to control the operating mode with scenes (scenes 1-16)

See also [scenes for operation mode](#) and [priorities in selecting operation mode](#).

Both access and learning telegram can be sent.

All scene numbers from 1 to 64 are possible.

The following parameters must be set here.

Table 57: Parameters for scene telegrams

Parameter page	Parameter name	Value
Transmit and display scene access telegrams		
<i>Page x, line y</i>	<i>Line format</i>	<i>Object type: Scene</i>
	<i>Authorise amendment of object value?</i>	<i>Yes</i>
Transmit and display learning telegrams		
<i>Page x, line y</i>	<i>Start memorising of scenes</i>	<i>Yes, by pressing OK for more than 3 seconds</i>

6.4.1 Allocate text to scene numbers

An up to 10 character long text can be displayed in place of a scene number.

Configuration is completed on the page of the relevant line (e.g. *page 2, line 1*).

The texts are entered on the *text list* parameter page

Only the *name of the lowest scene* needs to be entered for the allocation of text numbers. The following scene numbers are automatically allocated for the subsequent text numbers.

6.4.1.1 Examples:

Only scene numbers 1 to 10 are permitted in this example.

Scene no. 1 is allocated text 1, scene no. 2 text 2 etc.

If a scene number is sent or received, e.g. 10,

VARIA displays the entered name: Party.

Table 58: Scenes 1..10 with texts 1..10

Parameter page	Parameter name	Value
<i>Page 2, line 1</i>	<i>Line format</i>	<i>Object type: Scene</i>
	<i>Allocate text to scene number</i>	<i>Yes, display text instead of number</i>
	<i>Lower adjustable scene number</i>	<i>1</i>
	<i>Upper adjustable scene number</i>	<i>10</i>
	<i>Name of lower adjustable scene</i>	<i>See text list: Text 1</i>
<i>Text list</i>	<i>Text 1 (10)</i>	<i>Party</i>
	<i>Text 2 (10)</i>	<i>TV</i>

	<i>Text 9 (10)</i>	<i>Evening</i>
	<i>Text 10 (10)</i>	<i>Holiday</i>

Table 59: Text allocation

Scene		Text list	
1	_____	Text 1	Party
2	_____	Text 2	TV
...	_____
9	_____	Text 9	Evening
10	_____	Text 10	Holiday

Only scene numbers 20 to 29 are permitted in the following example.
 That means the lower scene number = 20.
 Texts 5..14 are allocated.

Table 60: Scenes 20.0.29 with texts 5.0.14

Parameter page	Parameter name	Value
<i>Page 2, line 1</i>	<i>Line format</i>	<i>Object type: Scene</i>
	<i>Allocate text to scene number</i>	<i>Yes, display text instead of number</i>
	<i>Lower adjustable scene number</i>	20
	<i>Upper adjustable scene number</i>	29
	<i>Name of lower adjustable scene</i>	<i>See text list: Text 5</i>
<i>Text list</i>	<i>Text 5</i> (10)	Work
	<i>Text 6</i> (10)	Conference

	<i>Text 13</i> (10)	Presentation
	<i>Text 14</i> (10)	Break

Table 61: Text allocation

Scene		Text list	
20	_____	Text 5	Work
21	_____	Text 6	Conference
22	_____	Text 7	...
23	_____	Text 8	...
24	_____	Text 9	...
25	_____	Text 10	...
26	_____	Text 11	...
27	_____	Text 12	...
28	_____	Text 13	Presentation
29	_____	Text 14	Break

6.5 Setpoint shift

The setpoint adjustment enables a dynamic adjustment of the setpoint to the outdoor temperature when cooling.

This function prevents too great a temperature deviation between the outside area and the cooled interior with high outside temperatures.

If the outdoor temperature exceeds a set threshold, adjustment is activated and a relevant increase of the setpoint is calculated.

The current outside external temperature for calculating the adjustment is made via object 27.

The setpoint adjustment is activated on the *RTR setting* parameter page via the *use setpoint value adjustment with high temperatures* and set on the *setpoint adjustment* parameter page.

The setpoint value adjustment is internally linked to the RTR so no bus connection is not required.

The standard DIN1946 part 2 (Jan 94) recommends increasing the setpoint value proportionally from a certain outside temperature.

Recommendation:

1 K per 3 K outdoor temperature

6.5.1 Format of setpoint adjustment: Relative

Setpoint adjustment is sent from object 2 as a temperature differential.

Under the setpoint adjustment threshold (*setpoint adjustment from*) the value 0 is sent.

If the setpoint value threshold is exceeded, the setpoint value is increased each time by 1 K if the outdoor temperature has risen above the configured value (*adjustment*).

Example: Calculated adjustment value

Setpoint adjustment from: 25 °C

Figure 4: Setpoint adjustment dependent on outdoor temperature

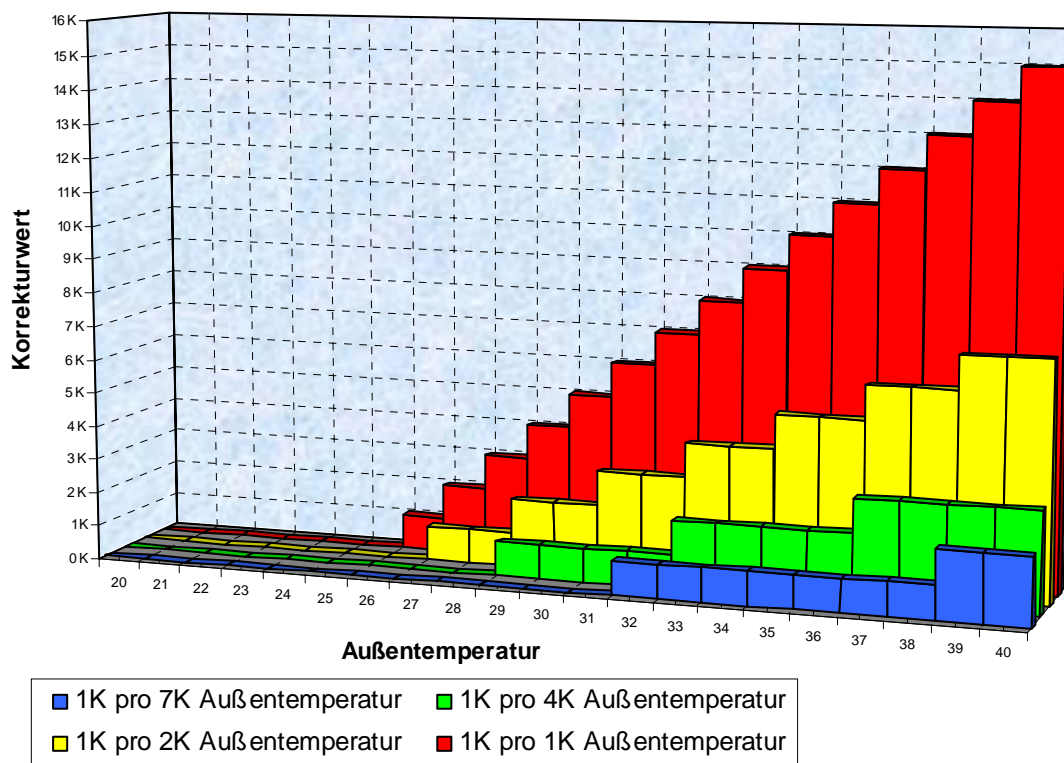


Table 62: Adjustment values

Outdoor temperature	1K/1K	1K/2K	1K/3K	1K/4K	1K/5K	1K/6K	1K/7K
20	0 K	0 K	0 K	0 K	0 K	0 K	0 K
21	0 K	0 K	0 K	0 K	0 K	0 K	0 K
22	0 K	0 K	0 K	0 K	0 K	0 K	0 K
23	0 K	0 K	0 K	0 K	0 K	0 K	0 K
24	0 K	0 K	0 K	0 K	0 K	0 K	0 K
25	0 K	0 K	0 K	0 K	0 K	0 K	0 K
26	1 K	0 K	0 K	0 K	0 K	0 K	0 K
27	2 K	1 K	0 K	0 K	0 K	0 K	0 K
28	3 K	1 K	1 K	0 K	0 K	0 K	0 K
29	4 K	2 K	1 K	1 K	0 K	0 K	0 K
30	5 K	2 K	1 K	1 K	1 K	0 K	0 K
31	6 K	3 K	2 K	1 K	1 K	1 K	0 K
32	7 K	3 K	2 K	1 K	1 K	1 K	1 K
33	8 K	4 K	2 K	2 K	1 K	1 K	1 K
34	9 K	4 K	3 K	2 K	1 K	1 K	1 K
35	10 K	5 K	3 K	2 K	2 K	1 K	1 K
36	11 K	5 K	3 K	2 K	2 K	1 K	1 K
37	12 K	6 K	4 K	3 K	2 K	2 K	1 K
38	13 K	6 K	4 K	3 K	2 K	2 K	1 K
39	14 K	7 K	4 K	3 K	2 K	2 K	2 K
40	15 K	7 K	5 K	3 K	3 K	2 K	2 K

6.5.2 Format of setpoint adjustment: Absolute

Object 2 sends the adjusted setpoint value to the bus for additional room temperature controller.

This setpoint value consists of:
Unadjusted base setpoint + dead zone + adjustment.

Example:

Setpoint adjustment from: 25 °C, unadjusted base setpoint : 21 °C, dead zone = 2 K

Figure 5: Setpoint adjustment dependent on outdoor temperature

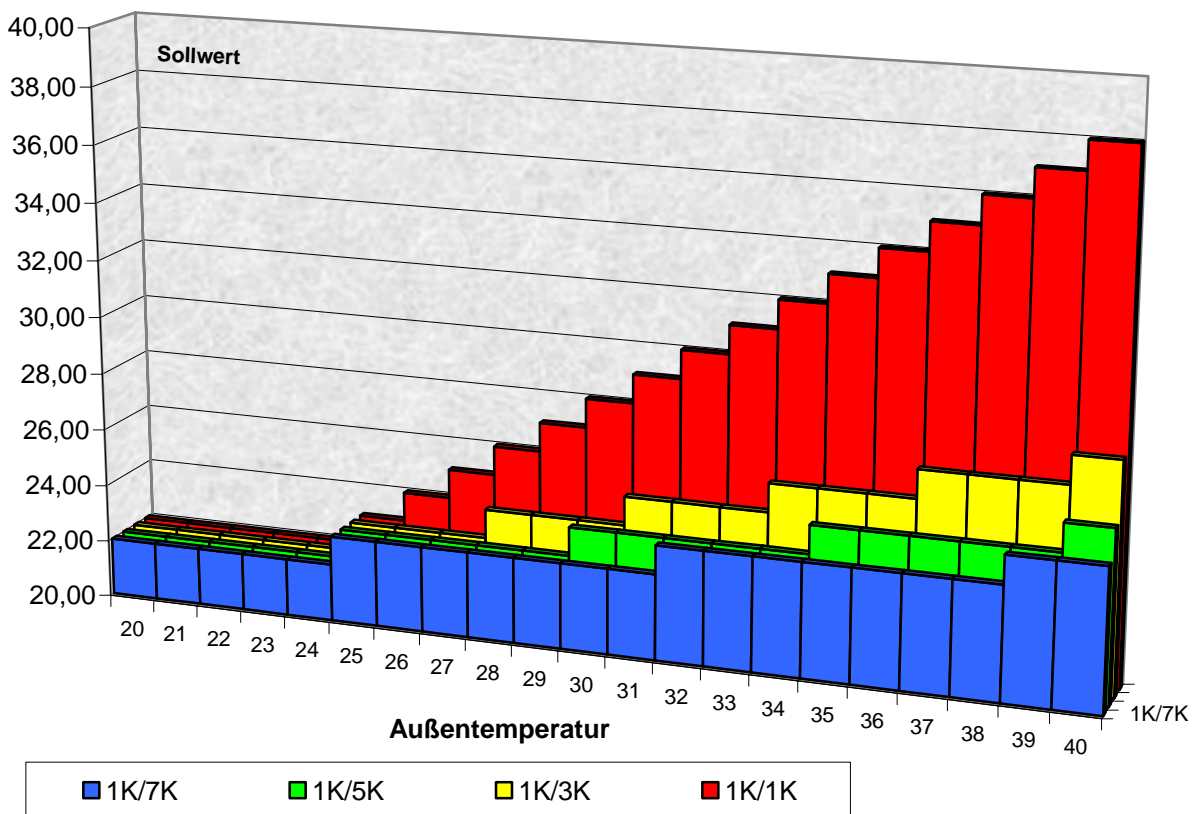


Table 63: Setpoint values

Outdoor temperature	1K/1K	1K/2K	1K/3K	1K/4K	1K/5K	1K/6K	1K/7K
20	22,00	22,00	22,00	22,00	22,00	22,00	22,00
21	22,00	22,00	22,00	22,00	22,00	22,00	22,00
22	22,00	22,00	22,00	22,00	22,00	22,00	22,00
23	22,00	22,00	22,00	22,00	22,00	22,00	22,00
24	22,00	22,00	22,00	22,00	22,00	22,00	22,00
25	23,00	23,00	23,00	23,00	23,00	23,00	23,00
26	24,00	23,00	23,00	23,00	23,00	23,00	23,00
27	25,00	24,00	23,00	23,00	23,00	23,00	23,00
28	26,00	24,00	24,00	23,00	23,00	23,00	23,00
29	27,00	25,00	24,00	24,00	23,00	23,00	23,00
30	28,00	25,00	24,00	24,00	24,00	23,00	23,00
31	29,00	26,00	25,00	24,00	24,00	24,00	23,00
32	30,00	26,00	25,00	24,00	24,00	24,00	24,00
33	31,00	27,00	25,00	25,00	24,00	24,00	24,00
34	32,00	27,00	26,00	25,00	24,00	24,00	24,00
35	33,00	28,00	26,00	25,00	25,00	24,00	24,00
36	34,00	28,00	26,00	25,00	25,00	24,00	24,00
37	35,00	29,00	27,00	26,00	25,00	25,00	24,00
38	36,00	29,00	27,00	26,00	25,00	25,00	24,00
39	37,00	30,00	27,00	26,00	25,00	25,00	25,00
40	38,00	30,00	28,00	26,00	26,00	25,00	25,00

6.6 Temperature control

6.6.1 Introduction

If the VARIA is not configured as a switching controller, it can alternatively be configured as a P or as a PI controller, whereby PI control is preferable.

With the proportional control (P control), the control variable is statically adjusted to the control deviation.

The proportional integral control (PI controller) is far more flexible, i.e. controls more quickly and more accurately.

To explain the function of both temperature controls, the following example compares the room to be heated with a vessel.

The filling level of the vessel denotes the room temperature.

The water supply denotes the radiator output.

The heat loss from the room is illustrated by a curve.

In our example, the maximum supply volume is 4 litres per minute and also denotes the maximum radiator output.

This maximum output is achieved with an actuating value of 100%.

Accordingly, with an actuating value of 50%, only half the water volume, i.e. 2 litres per minute, would flow into our vessel.

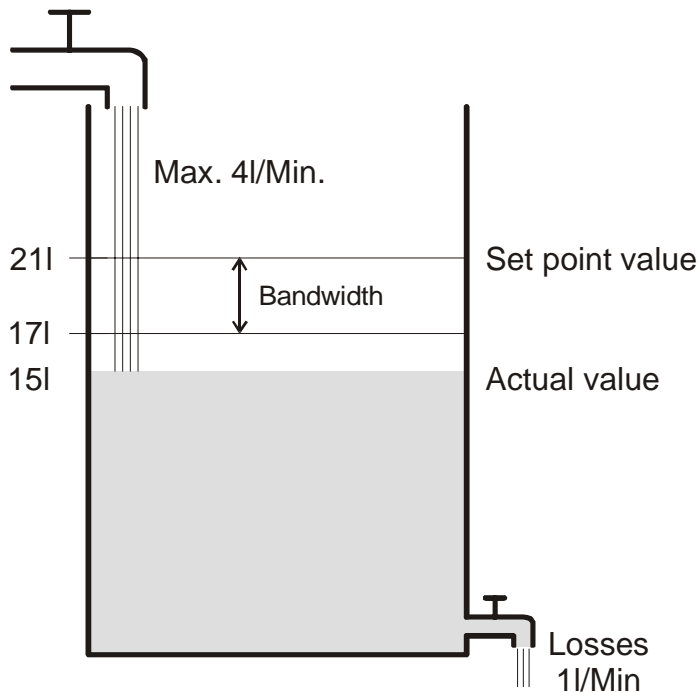
The bandwidth is 4l.

This means that the controller operates at 100% provided the actual value is smaller than, or equal, to $(211 - 41) = 171$.

Function:

- Desired filling volume:
21 litres (= setpoint)
- From what point should the supply flow gradually be reduced to avoid an overflow? :
4l below the desired filling volume, i.e. at $211 - 41 = 171$ (=bandwidth)
- Original filling volume \square
15l (=actual value)
- The loss amounts to 1l/minute

6.6.2 Response of the P-control



A filling volume of 15l gives rise to a control deviation of $211 - 151 = 61$

As our actual value lies outside the bandwidth, the control will operate the flow rate at 100% i.e. at 4l / minute

The supply quantity (control variable) is calculated from the control deviation (setpoint value – actual value) and the bandwidth.

$$\text{Control variable} = (\text{control deviation} / \text{bandwidth}) \times 100$$

The table below shows the response and therefore also the limits of the P-control

Table 64

Filling level	Control variable	Supply	Loss	Increase in filling level
15l	100%	4 l/min	1 l/min	3 l/min
19l	50%	2 l/min		1 l/min
20l	25%	1 l/min		0 l/min

The last line indicates that the filling level cannot increase any further, because the inflow only allows the same amount of water to flow in as flows out through loss.

The result is a permanent control deviation of 1l and the setpoint value can never be reached. If the loss was 1l higher, the permanent control deviation would increase by the same amount and the filling level would never exceed the 19l mark.

In a room this would mean that the control deviation increases with a decreasing outside temperature.

P-control as temperature control

The P-control response during heating control is as shown in the previous example. The setpoint temperature (21°C) can never quite be reached.

The permanent control deviation increases as the heat loss increases and decreases as the ambient temperature decreases.

6.6.3 Response of the PI controller

Unlike the pure P-control, the PI controller works dynamically. With this type of controller, the actuating value remains unchanged, even at a constant deviation.

In the first instant, the PI controller sends the same actuating value as the P-control, although the longer the setpoint value is not reached, the more this value increases.

This increase is time-controlled over the so-called integrated time.

With this calculation method, the actuating value does not change if the setpoint value and the actual value are the same.

Our example, therefore, shows equivalent in and outflow.

Notes on temperature control:

Effective control depends on agreement of bandwidth and integrated time with the room to be heated.

The bandwidth influences the increment of the actuating value change:

Large bandwidth = finer increment on control variable change.

The integrated time influences the response time to temperature changes:

Long integrated time = slow response.

Poor agreement can result in either the setpoint value being exceeded (overshoot) or the control taking too long to reach the setpoint value.

Usually, the best results are achieved with the standard settings or the settings via system type.

6.7 Continuous and switching control

A switching (2 point) control recognises only 2 statuses, On or Off.

A continuous control works with a control variable between 0% and 100% and can thus exactly measure out the energy input. This achieves a pleasant and precise degree of control.

Table 65: Summary of control function

Operation mode / stage	Type of control	Hysteresis
Heating	2-point / PI controller	positive
Cooling	2-point / PI controller	negative
Additional stage	2-point / P control	negative

6.8 Hysteresis

Hysteresis determines the difference between a controller's switching on and off temperature. It can be both positive and negative.

A combination of heating and cooling control influences the amount of the [dead zone](#).

Without hysteresis, the control would activate and deactivate continuously provided the temperature is within the setpoint value range.

6.8.1 Negative hysteresis:

Heating: Heating is provided until the setpoint value has been reached.

Afterwards the heating is only switched on again when the temperature falls below the "Hysteresis setpoint value" threshold.

Cooling: Cooling lasts until the "Hysteresis setpoint value" threshold has been achieved. Afterwards, it is only switched on again when the temperature rises above the setpoint.

Example of additional heating stage

Additional stage with a setpoint value of 20 °C, hysteresis 0.5 K and starting temperature 19 °C.

The additional stage is switched on and does not switch off again until the setpoint value (20) is reached.

The temperature falls and the additional stage does not switch on again until $20 - 0.5K = 19.5$.

Cooling example:

Cooling with setpoint value 25 °C, hysteresis = 1 °C and ambient temperature 27 °C.

The cooling is switched and only switched off again when a temperature of 24C (25 °C – 1 °C) is achieved.

It switches on again when the temperature rises above 25 °C.

6.8.2 Positive hysteresis

Heating lasts until the temperature reaches "setpoint value + hysteresis " threshold has been achieved.

The heating is only switched on again when the temperature falls below the setpoint value.

Heating example:

Heating with setpoint value 20°C, hysteresis = 1°C and ambient temperature 19 °C.

The heating is switched on and only switches off again when a temperature of 21C (20 °C + 1 °C) is achieved.

It switches on again when the temperature falls below 20 °C.

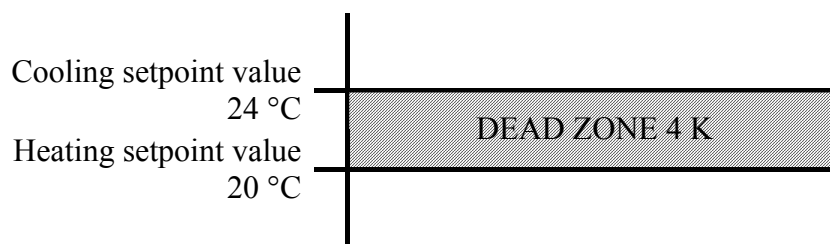
6.9 Dead zone

The dead zone is a buffer area between heating and cooling operation. Neither heating nor cooling takes place within this dead zone.

Without this buffer zone, the system would switch continuously between heating and cooling. As soon as the setpoint value has been under-run, the heating is activated and the setpoint value would not be achieved. If cooling were then to be started immediately, the temperature would fall below the setpoint value and switch on the heating again..

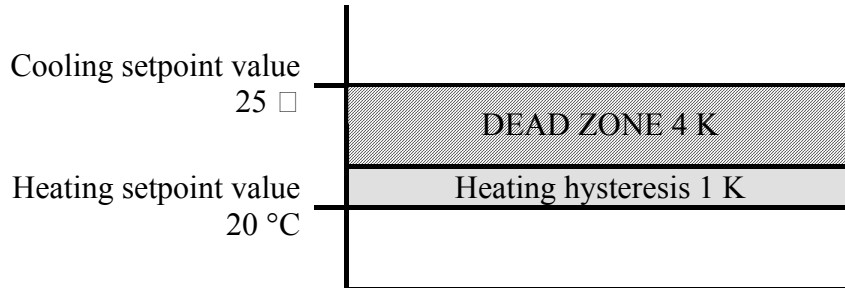
Depending on the type of control, the dead zone can be extended by the value of the [hysteresis](#).

6.9.1 Case 1: Heating and cooling with continuous control



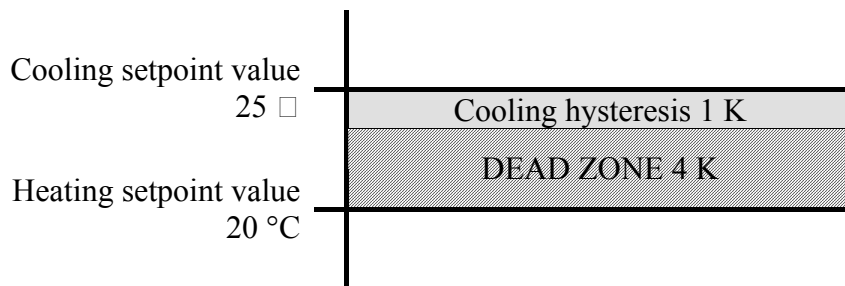
The dead zone (4 K) is not affected

6.9.2 Case 2: Heating with 2-point control and cooling with continuous control



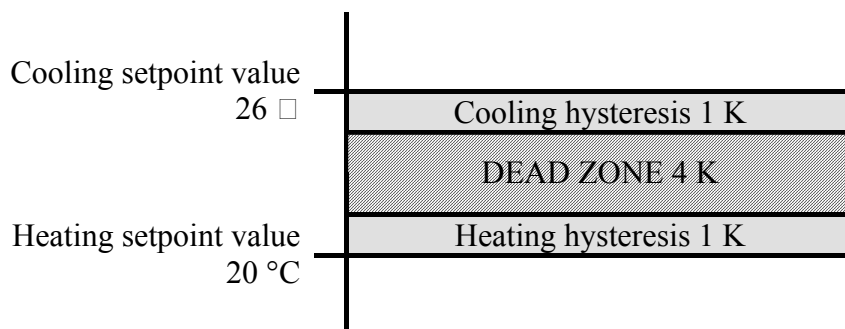
The dead zone (4 K) is increased by the value of the hysteresis (1K) and offsets the cooling setpoint value to 25 °C.

6.9.3 Case 3: Heating with continuous control and cooling with 2-point control



The dead zone (4 K) is increased by the value of the hysteresis (1K) and offsets the cooling setpoint value to 25 °C.

6.9.4 Case 4: Heating and cooling with 2-point control



The dead zone (4 K) is increased by the value of both hysteresis (2K) and offsets the cooling setpoint value to 26 °C.

6.10 Freely programmable display pages

VARIA has 5 freely programmable display pages with 8 independent, freely programmable lines that can be activated on the *select display pages* parameter pages (parameter *fade in page x for display objects*).

Each line is divided up into 1 to 3 sections:

- A descriptive text (e.g. kitchen temperature)
- of a value or status display (= object value or status)
- if necessary, a unit display (e.g. °C)

Each line is allocated an object (see [object 39](#)), with the dimmer or blinds control function there are two (see [object 40](#)).

2 functions can be used according to the [line format](#) :

- Display value or status
- Display value or status and change using + and - buttons.

This is defined by the *permit change of object value?* parameter.

Table 66: Overview of line formats

Line format	Parameters	Length	Object type
Entered text	Line texts	22	-
Switch on object type	Line texts	14	1 bit
	Text at object value = 0 / 1	7	KNX 1.001
Percentage value object type	Line texts	14	1 byte
	Text at object value 0	7	KNX 5.001
HVAC operation mode object type	Line texts	14	1 byte KNX 6.010
Counter value 0..255 object type	Line texts	14	1 byte
	Unit for display object	3	KNX 6.010
Dimming object type	Line texts	14	4 bit
	Text at object value = 0 / 1	7	KNX 3.007
Temperature object type	Line texts	12	2 byte
	Unit for display object	3	KNX 9.001
EIS 5 object type	Line texts	11	2 byte
	Unit for display object	3	KNX 9.*
Counter value 0.0.65535 object type	Line texts	14	2 byte
	Unit for display object	3	KNX 8.*
Scene object type	Line texts	11	1 byte KNX 6.010
Blinds/shutters object type	Line texts	22	1 bit KNX 1.009 / 1.010
Priority object type	Line texts	12	2 bit KNX 2.001
	Text at "no priority "	7	
	Text at "priority Off "	7	
	Text at "priority On "	7	
Display text string object type	Bus telegrams	14	14 byte KNX 16.000

→ See example "[Maximum text length for the display pages depending in line format](#)" and [template](#) at the end of the manual.

6.11 Operation mode selection

6.11.1 Priorities for operation mode selection

The operation mode selection between comfort, standby, night operation and frost protection can happen in

4 different ways:

- Via object 7 *operation mode selection*
- Manually on device on RTR page
- Via the switching program
- Via scene control

All 4 possibilities are all on the same priority level.

The following applies: The last instruction overwrites the previous one.

Exception: Frost mode via window contact (object 9) has priority on all other operation modes.

Selection of *presence sensor* parameter also involves:

1. If a new operation mode is received on object 7 with the presence object set (*preselection of operating mode*), then it is accepted and the presence object is reset (only with presence sensor).
2. Reception of the same operation mode prior to the presence status (e.g. via cyclical sending) is ignored.
3. If the presence object is set during night / frost operation, it is reset after the configured comfort extension finishes (see below).
4. If the presence object is set during standby mode, the comfort operation mode is accepted without time restriction.

6.11.2 Determining the Current operating mode

The current setpoint value can be adjusted to the relevant requirements via the choice of operation mode.

The operation mode can be specified by objects 7.0.9.

There are two methods available:

6.11.2.1 New operation modes

If "*Objects to select operating mode*" = *new*:... selected on the RTR setting parameter page then the Current operating mode is set out as follows:

Table 67

Preselection of operating mode Object 7	Presence Object 8	Window state Object 9	Current operating mode (object 12)
Any	Any	1	Frost / heat protection
Any	1	0	Comfort
Comfort	0	0	Comfort
Standby	0	0	Standby
Night	0	0	Night
Frost / heat protection	0	0	Frost / heat protection

Typical application:

In the mornings, object 7 activates “standby” or “comfort” operation mode and in the evenings “night” operation mode via a timer (e.g. TR 648).

During holiday periods, object 7 also selects frost / heat protection via another channel on the timer.

Object 8 is connected to a presence detector. If a presence is detected VARIA switches to comfort operation mode (see table).

Object 9 is connected to a window contact via the bus (binary inputs).

As soon as a window is opened, VARIA switches to frost protection operation mode.

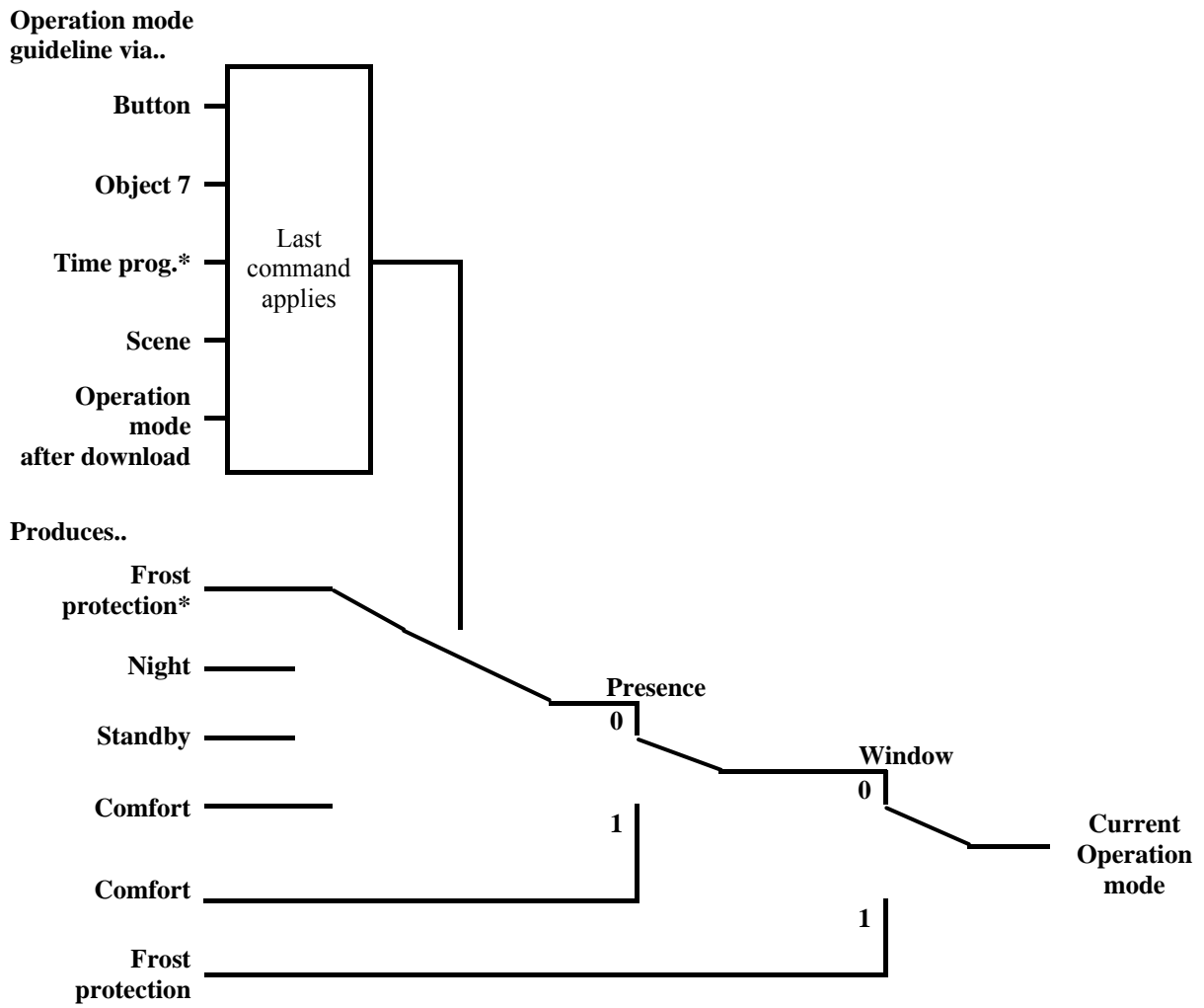


Figure 6

* Frost protection switching protection possible

6.11.2.2 Old operation modes

If *Objects to select operating mode = old:...* selected on the RTR setting parameter page then the Current operating mode is set out as follows:

Table 68

Night Object 7	Comfort Object 8	Object 9 frost/heat protection	Current operating mode Object 12
Any	Any	1	Frost / heat protection
Any	1	0	Comfort
Standby	0	0	Standby
Night	0	0	Night

Typical application:

In the mornings, "standby" operation mode, and in the evenings "night" operation mode are activated via a timer via object 7.

In holiday periods, frost/heat protection is selected on another channel via object 9.

Object 8 (comfort) is connected to a presence detector. If a presence is detected, VARIA switches to comfort operation mode (see table).

Object 9 is connected to a window contact. As soon as a window is opened, VARIA switches to frost protection operation mode.

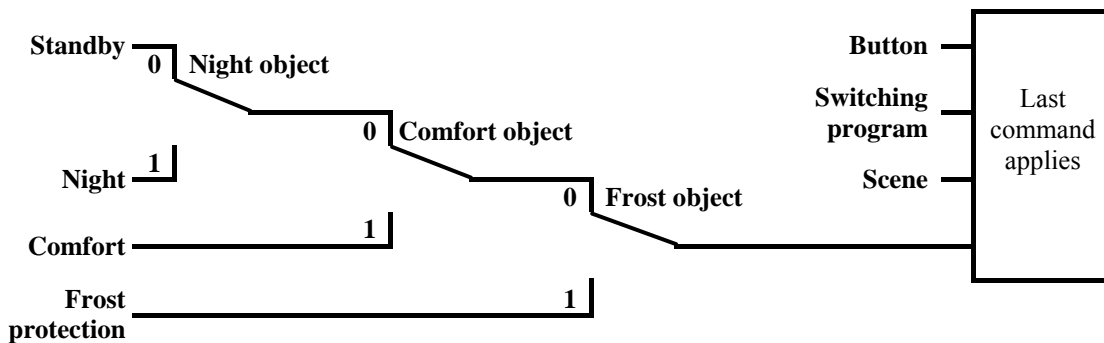


Figure 7

The old method has two advantages over the new method:

1. To switch from comfort to night operation mode, 2 telegrams (2 timer channels if necessary) are required.
Object 8 must be set to “0” and object 7 to “1”.
2. If during periods when “frost / heat protection” is selected via the timer, the window is opened and then closed again, the “frost / heat protection” operation mode is cleared.

6.11.2.3 Determining the setpoint value

6.11.2.3.1 Calculating the setpoint value in heating operation

See : [Base setpoint value and current setpoint value](#)

Table 69: Current setpoint value during heating

Operation mode	Current setpoint value
COMFORT	Basic setpoint value +/- setpoint value offset
Standby	<i>Base setpoint value</i> +/- setpoint value offset – <i>reduction in standby mode</i>
Night	<i>Base setpoint value</i> +/- setpoint value offset – <i>reduction in night operation mode</i>
Frost / heat protection	configured <i>setpoint for frost protection mode</i>

Example:

Heating in comfort operation mode.

Parameter page	Parameters	Setting
<i>Setpoint values</i>	<i>Base setpoint after reset</i>	21 °C
	<i>Reduction in standby operation mode (during heating)</i>	2 K
<i>Operation</i>	<i>Maximum allowed setpoint value offset</i>	+/- 2 K

The setpoint value was previously increased by 1 K using the + button.

Calculation:

$$\begin{aligned}
 \text{Current setpoint value} &= \text{base setpoint} + \text{setpoint offset} \\
 &= 21 \text{ °C} + 1\text{K} \\
 &= 22 \text{ °C}
 \end{aligned}$$

If operation is switched to standby mode, the [current setpoint value](#) is calculated as follows:

$$\begin{aligned}
 \text{Current setpoint} &= \text{base setpoint} + \text{setpoint offset} - \text{reduction in standby mode} \\
 &= 21 \text{ °C} + 1\text{K} - 2\text{K} \\
 &= 20 \text{ °C}
 \end{aligned}$$

6.11.2.3.2 Calculating the setpoint value in cooling operation

Table 70: Current setpoint value during cooling

Operation mode	Current setpoint value
Comfort	Basic setpoint value + <i>setpoint adjustment</i> + <i>dead zone</i>
Standby	Base setpoint value + <i>setpoint value offset</i> + <i>dead zone</i> + <i>increase in standby mode</i>
Night	Base setpoint value + <i>setpoint offset</i> + <i>dead zone</i> + <i>increase in night mode</i>
Frost / heat protection	configured <i>setpoint value for heat protection mode</i>

Example: Cooling in comfort operation mode.

The room temperature is too high and VARIA has switched to cooling operation

Table 71

Parameter page	Parameters	Setting
<i>RTR setting</i>	<i>Maximum allowed setpoint value offset</i>	+/- 2 K
<i>Heating setpoint values</i>	<i>Base setpoint value after loading the application</i>	21 °C
<i>Cooling setpoint values</i>	<i>Dead zone between heating and cooling</i>	2 K
	<i>Increasing in standby mode (during cooling)</i>	2 K

The setpoint value was previously lowered by 1 K on the device.

Calculation:

$$\begin{aligned}
 \text{Current setpoint value} &= \text{Basic setpoint value} + \text{setpoint offset} + \text{dead zone} \\
 &= 21^{\circ}\text{C} - 1\text{K} + 2\text{K} \\
 &= 22^{\circ}\text{C}
 \end{aligned}$$

Changing to standby mode causes a further increase in the setpoint value (energy saving) and gives rise to the following setpoint value.

Setpoint value = base setpoint value + setpoint value offset + dead zone + increase in standby mode

$$\begin{aligned}
 &= 21^{\circ}\text{C} - 1\text{K} + 2\text{K} + 2\text{K} \\
 &= 24^{\circ}\text{C}
 \end{aligned}$$

6.12 Setpoint offset

The [current setpoint value](#) can be adjusted in 2 ways with VARIA.

- step by step with the + and – buttons on the RTR page
- Directly via Object 1 “Manual setpoint value offset”

The differential between the setpoint value offset and the base setpointvalue is sent by object 1 at each change (e.g. -1.00) using the +/- buttons .

The offset limits are specified on the *RTR setting* parameter page by the *maximum setpoint value offset on the rotary control* parameter and apply to both types of setpoint value offset.

Table 72: Example of temperature offset with base setpoint value = 20 °C

Maximum allowed setpoint value offset	Setting range	
	From	1 through
+/- 1 K	19 °C	21 °C
+/- 2 K	18 °C	22 °C
+/- 5 K	15 °C	25 °C

6.12.1 Setpoint temperature offset via the + and - buttons

- Select temperature display using ▲ ▼ .
- Use + or – to set desired setpoint value.
- Confirm with OK.

If the hotkey function is deactivated selection with the ▲ ▼ key can be omitted:

Every setpoint value offset via the +/- buttons (confirmed with OK) is sent to object 1.

If a 0 is received by object 1, a previously entered setpoint value offset is reset to 0 K.

6.12.2 Setpoint temperature offset via object 1

In this case, the setpoint value is changed by sending the desired offset to object 1. This involves the differential to the base setpoint value (may be preceded by a minus sign) being sent to object 1 in EIS5 format.

Example Base setpoint value of 21°C:

If object 1 receives a value of 2.00, the new setpoint value is calculated as follows:
 $21^{\circ}\text{C} + 2.00\text{K} = 23.00^{\circ}\text{C}$.

In order to bring the setpoint value to 22°C, the differential to the programmed base setpoint value (here 21°C) is sent to object 1, in this case, 1.00K ($21^{\circ}\text{C} + 1.00\text{K} = 22^{\circ}\text{C}$)

The offset always relates to the [basic setpoint value](#) (as configured) and not to the current setpoint value.

6.13 Base setpoint value and current setpoint value

The **basicsetpointvalue** is the standard temperature for the comfort mode and the reference temperature for reduction in standby and night modes.

The configured basic setpoint value (see "[Basic setpoint value after downloading of application](#)") is stored in object 0 and can be amended at any time via the bus, by sending a new value to [object 0](#).

After reset (bus returned), the last used base setpoint value is restored.

The **current setpoint value** is the value that actually determines the control. It is the result of all the operation mode reductions or increases depending on the control function.

Example:

At a base setpoint value of 22°C and a reduction in night mode of 4K, the current setpoint value (in night mode) is: $22^{\circ}\text{C} - 4\text{K} = 18^{\circ}\text{C}$. During the day (in comfort mode) the current setpoint value is 22°C (in heating mode).

The formation of the current setpoint value relating to the base setpoint value can be observed in the block diagram on the next page:

The base setpoint value on the left is specified via object 0 or set on the device.

The current setpoint value is on the right, i.e. the value upon which the room temperature is effectively controlled.

As you can see in the block diagram, the current setpoint value depends on the operation mode (5) and the control function (4) selected.

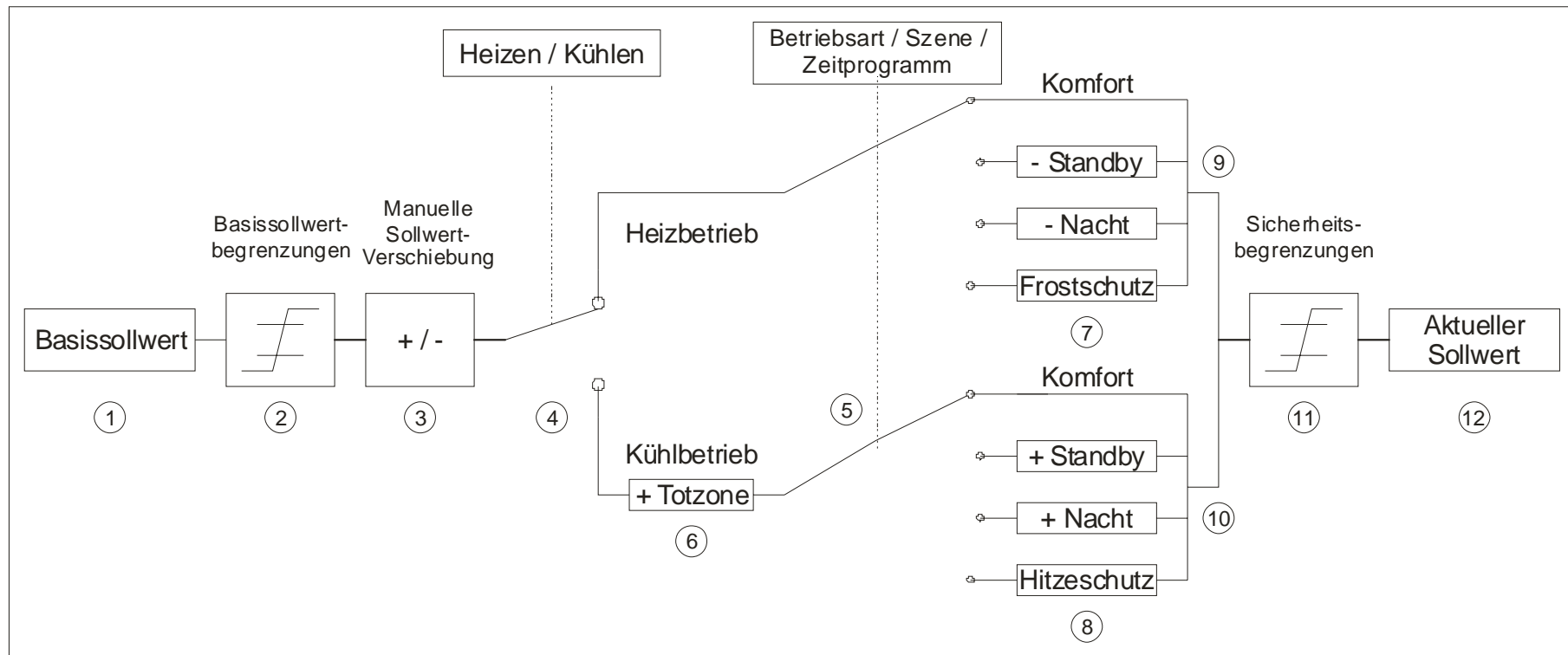
The base setpoint value limits (2) prevent an incorrect base setpoint value from being specified to

object 0. These are the following parameters:

- *Minimum valid base setpoint value*
- *Maximum valid base setpoint value*

The base setpoint value limits (11) prevent an incorrect base setpoint value from being specified to

6.13.1 Setpoint value calculation



- | | |
|--|--|
| <p>1 Specified base setpoint value from object 0 or user input</p> <p>2 Max. and min. valid base setpoint values</p> <p>3 Manual setpoint offset</p> <p>4 Switches between heating and cooling: Automatically or via object 6</p> <p>5 Selection of operation mode, by operator, object, switching program or scene.</p> <p>6 The setpoint value is increased in cooling mode by the amount of the dead zone</p> | <p>7 The setpoint value is replaced by the setpoint value for frost protection mode</p> <p>8 The setpoint value is replaced by the setpoint value for heat protection mode</p> <p>9 Setpoint value after reductions conditional to the operation mode</p> <p>10 Setpoint value after increases conditional to the operation mode</p> <p>11 The limits for frost and heat protection must be adhered to.</p> <p>12 Current setpoint value according to increases, reductions and limits conditional to the operation.</p> |
|--|--|

6.14 Maximum text length according to line format

Text elements		Max. length	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Object type	
Page heading																										
Object type	Parameters																									
Entered text	Line texts																									
Switching	Line texts																									1 bit KNX 1.001
	Text with Obj. value = 0																									
	Text with Obj. value = 1																									
Percentage value	Line texts																									1 byte KNX 5.001
	Text at object value = 0																									
	Text with Value = 1																									
HVAC	Line texts																									1 byte KNX 6.010
Counter value 0..0.255	Line texts																									1 byte KNX 6.010
	Unit for number of object																									
Dimming	Line texts																									4 bit KNX 3.007
	Text at object value = 0																									
	Text at object value = 1																									
Temperature	Line texts																									2 byte KNX 9.001
	Unit for number of object																									
EIS 5	Line texts																									2 byte KNX 9.*
	Unit for number of object																									
Counter value 0..65535	Line texts																									2 byte KNX 8.*
	Unit for number of object																									
Scene	Line texts																									1 byte KNX 6.010
	Scene text																									
Blinds/ Shutter	Line texts																									1 bit KNX 1.009 / 1.010
Priority	Line texts																									2 bit KNX 2.001
	Text at "no priority "																									
	Text at "priority off"																									
	Text at "priority on"																									
Valuator	Line texts																									1 byte KNX 5.001

