KNX T-UP Touch
Temperature Sensor

Item numbers 70629 (traffic white), 70628 (black), 70627 (pure white)

elsner® elektronik

Installation and Adjustment

Installation, inspection, commissioning and troubleshooting of the device must only be carried out by a competent electrician.

This manual is amended periodically and will be brought into line with new software releases. The change status (software version and date) can be found in the contents footer. If you have a device with a later software version, please check **www.elsner-elektronik.de** in the menu area "Service" to find out whether a more up-to-date version of the manual is available.

Clarification of signs used in this manual

Safety advice.

Safety advice for working on electrical connections, components, etc.

DANGER! ... indicates an immediately hazardous situation which will lead to death or severe injuries if it is not avoided.

WARNING! ... indicates a potentially hazardous situation which may lead to death or severe injuries if it is not avoided.

CAUTION! ... indicates a potentially hazardous situation which may lead to trivial or minor injuries if it is not avoided.

ATTENTION! ... indicates a situation which may lead to damage to property if it is not avoided.

ETS   In the ETS tables, the parameter default settings are marked by underlining.

1.   Description

The **Sensor KNX T-UP Touch** measures the room temperature. The indoor sensor can receive an external measured value via the bus and process it with own data to overall temperature value (mixed value).

The **KNX T-UP Touch** offers two push buttons that may be used for changing the ambient temperature (target value), for switching between operating modes or as free programmable bus push buttons.

The **KNX T-UP Touch** provides adjustable threshold values. The threshold value outputs and further communication objects can be linked by AND and OR logic gates. Additionally, an integrated actuating variable comparator can compare and output values that are received via communication objects. The sensor has integrated PI controller for a heating/cooling system.

The integrated display shows the own values and data received from the bus (e.g. date, time). The device is completed with a frame of the switching series installed in the building and thus merges with the interior.

Functions:
- Measurement of **temperature**
- **Mixed value** from own measured values and external values (proportions can be set in percentage)
- **Display** 1-3 rows (own values or values received from the bus) or display of temperature control (see *Mode display and manual temperature controller*, page 10)
- **2 push buttons**. Configuration as bus push button or for changing ambient temperature and switching between operating modes (see *Change ambient temperature with the buttons*, page 11)
- **PI controller for heating** (one or two step) and **cooling** (one or two step) depending on temperature. Control according to separate target values or basic target temperature
- **Threshold values** can be adjusted per parameter or via communication objects: 3 × temperature
- **4 AND and 4 OR logic gates** with each 4 inputs. Every switching incident as well as 16 logic inputs in the form of communication objects, may be used as inputs for the logic gates. The output of each gate may optionally be configured as 1 bit or 2 x 8 bits
- **2 actuating variable comparators** for output of minimum, maximum or average values. Each with 5 inputs (for values received via communication objects)

Configuration is made using the KNX software ETS 5. The **product file** can be downloaded from the ETS online catalogue and the Elsner Elektronik website on **www.elsner-elektronik.de** in the "Service" menu.

1.0.1. Scope of delivery

- Housing with display

- Base plate

You will need *in addition* (not supplied):
- Socket Ø 60 mm, 42 mm deep
- Frame (for element 55 x 55 mm), suitable for the switching programme used in the building

1.1.　Technical specifications

Housing	ABS plastic material
Colours	• similar to RAL 9003 signal white • similar to RAL 9010 pure white • similar to RAL 9005 jet black
Mounting	In-wall (wall mounting in socket Ø 60 mm, 42 mm deep, resp. cavity wall socket for hole Ø 68 mm)
Protection category	IP 20
Dimensions	Housing approx. 55 x 55 (W x H, mm), mounting depth approx. 8 mm, base plate approx. 71 x 71 (W x H, mm)
Total weight	approx. 50 g
Ambient temperature	Operation 0…+50°C, storage -10…+60°C
Ambient air humidity	max. 95% RH, avoid bedewing
Operating voltage	KNX bus voltage
Bus current	max. 10 mA
Data output	KNX +/- bus terminal plug
BCU type	Own micro controller
PEI type	0
Group addresses	max. 254
Allocations	max. 254
Communication objects	180
Temperature measurement range	0…+50°C
Temperature resolution	0.1°C
Temperature accuracy	± 0,5°C at 0…+50°C (Mind the notes on *Accuracy of the measurement*, page 6)

The product conforms with the provisions of EU guidelines.

1.1.1. Accuracy of the measurement

Measurement variations from permanent sources of interference (see chapter *Installation position*) can be corrected in the ETS in order to ensure the specified accuracy of the sensor (offset).

When **measuring temperature**, the self-heating of the device is considered by the electronics. The heating is compensated by the software.

2.   Installation and commissioning

2.1.   Installation notes

Installation, testing, operational start-up and troubleshooting should only be performed by an electrician.

CAUTION!
Live voltage!
There are unprotected live components inside the device.
- National legal regulations are to be followed.
- Ensure that all lines to be assembled are free of voltage and take precautions against accidental switching on.
- Do not use the device if it is damaged.
- Take the device or system out of service and secure it against unintentional use, if it can be assumed, that risk-free operation is no longer guaranteed.

The device is only to be used for its intended purpose. Any improper modification or failure to follow the operating instructions voids any and all warranty and guarantee claims.

After unpacking the device, check it immediately for possible mechanical damage. If it has been damaged in transport, inform the supplier immediately.

The device may only be used as a fixed-site installation; that means only when assembled and after conclusion of all installation and operational start-up tasks and only in the surroundings designated for it.

Elsner Elektronik is not liable for any changes in norms and standards which may occur after publication of these operating instructions.

2.2.   Installation position

The **Sensor KNX T-UP Touch** is made for wall mounting in a socket (Ø 60 mm, 42 mm deep).
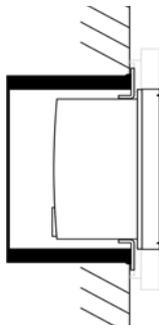
Fig. 1: Sectional drawing.
*The **Sensor KNX T-UP Touch** fits into a standard socket (Ø 60 mm, depth 42 mm).*

The frame is not included!

May be installed and operated in dry interior rooms only. Avoid condensation.

When selecting an installation location, please ensure that the measurement results are affected as little as possible by external influences. Possible sources of interference include:
• Direct sunlight
• Drafts from windows and doors
• Draft from ducts which lead from other rooms or from the outside to the junction box in which the sensor is mounted
• Warming or cooling of the building structure on which the sensor is mounted, e.g. due to sunlight, heating or cold water pipes
• Connection lines and ducts which lead from warmer or colder areas to the sensor

Measurement variations from permanent sources of interference can be corrected in the ETS in order to ensure the specified accuracy of the sensor (offset).

2.3.   Composition

2.3.1. Housing
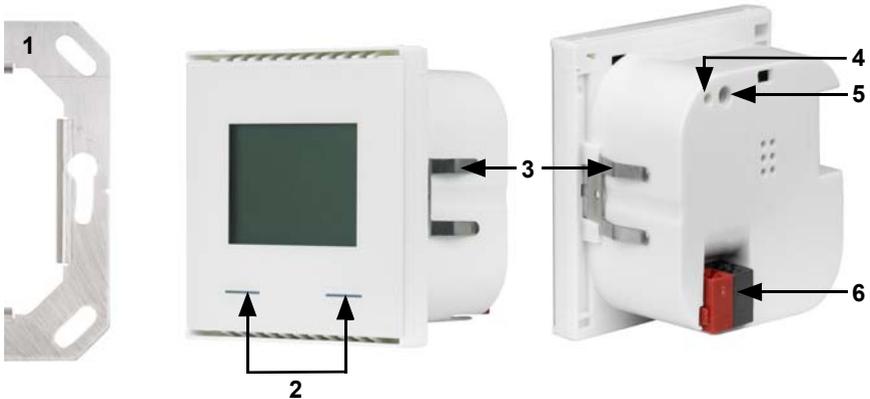
Fig. 2
1   *Base plate*
2   *Touch sensitive buttons*
3   *Catches*
4   *Programming LED (recessed)*
5   *Programming button (recessed) for teaching device*
6   *KNX terminal BUS +/-*

2.4.   Assembly of the sensor

First of all fit the wind-proof socket with connection. Also seal inlet pipes to avoid infiltration.
Screw the base plate onto the socket and position the frame of the switching programme. Connect the bus line +/- to the black-red plug.
Pin the housing with the notches on to the metal frame, so that device and frame are fixed.

2.5.   Notes on mounting and commissioning

Never expose the device to water (e.g. rain) or dust. This can damage the electronics. You must not exceed a relative humidity of 95%. Avoid condensation.

After the bus voltage has been applied, the device will enter an initialisation phase lasting a few seconds. During this phase no information can be received or sent via the bus.

3. Display and operation at the device

Detailed specifications for the display and the use of the push buttons are set in the ETS.

Basically the display can show a two-row or three-row text (e. g. for measured values) or a temperature controller. You can switch between the two types by pressing one of the buttons, if this has not been disabled in the ETS.

3.1. Mode display and manual temperature controller

Depending on the ETS setting selected, the mode display will only display show the current target value, or the base target value setting with scale display. The manually adjustable range can be set in the ETS.

The following display options are available:
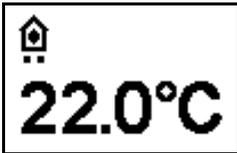
Fig. 3
Mode display with current target value and/or base target value
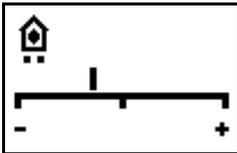
Fig. 4
Mode display with scale display for adjusting the base target value.
The control position in the image reads "Base target value reduced".
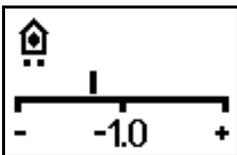
Fig. 5
Mode display with scale display and number.
Shows the set target value change.
The control position in the image reads "Base target value reduced to 1.0°".
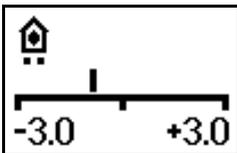
Fig. 6
Mode display with scale display and range.
Shows the possible adjustment range (as set in the ETS).
The control position in the image reads "Base target value reduced".
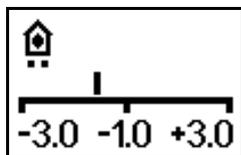
Fig. 7
Mode display with scale display, range and number.
Displays the possible adjustment range (as set in the ETS) and the set target value change.
The control position in the image reads "Base target value reduced to 1.0°".

Symbols

⌂	Comfort mode. Comfort (present) target temperature will be used.	⌂◆	Standby mode. Standby (absent during day) target temperature will be used.
☾	Eco mode. Night target temperature will be used.	⌂	Building protection mode. Building protection target temperature will be used. The symbol will blink when the mode has been activated but the activation delay has not yet expired.
⌇⌇⌇	Heating mode. Heating will be provided.	❄	Cooling mode Cooling will be provided.

Priority (points)
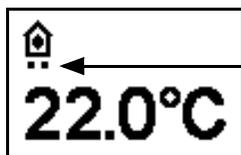
Fig. 8
In "HVAC mode with 2x 8 bits" control mode, points are shown under the symbol, to indicate the running priority of the current mode.

One point: Priority 1/priority control. It is not possible to adjust the temperature automation system manually. Neither the target temperature nor the operating modes can be changed using the buttons on the unit.

Two points: Priority 2. The target temperature and operating mode can be changed using the buttons.

3.2. Change ambient temperature with the buttons

If the mode display is active, the target ambient temperature and the operating mode can be changed manually using the buttons. The button functions can be blocked in the ETS or be suppressed for Priority 1 operating modes. The individual operating modes can also be locked for manual selection in the ETS.

Decrease target temperature (-)	briefly press left button	Ambient temperature in the current mode is decreased. The sep-size is defined in the ETS (0.1°C to 5°C).
Increase target temperature (+)	briefly press right button	Ambient temperature in the current mode is increased. The sep-size is defined in the ETS (0.1°C to 5°C).
Change mode	press left or right button longer than 2 secs.	Changes between the operating modes Comfort, Standby, Eco and Building Protection (if deblocked in the ETS).
Extend Comfort mode	in Eco mode: press both buttons at the same time longer than 2 secs.	Switches from Eco to Comfort mode again for a certain time (e. g. if the rooms are used longer in the evening). The period is defined in the ETS (up to 10 hours). The time remaining in Comfort mode is displayed.

4.   Transfer protocol

Units:

   Temperatures in degrees Celsius
   Air humidity in %
   Absolute air humidity in g/kg and/or g/m^3
   Variables in %

4.1.   List of all communications objects

Abbreviation flags:

C   *Communication*
R   *Read*
W   *Write*
T   *Transfer*
U   *Update*

No	Name	Function	Flags	Data Point Type	Size
0	Software version	readable	R-CT	[217.1] DPT_Version	2 Bytes
1	Temperature sensor malfunction	Output	R-CT	[1.1] DPT_Switch	1 Bit
3	External measured value for temperature	Input	-WC-	[9.1] DPT_Value_Temp	2 Bytes
4	Internal measured value for temperature	Output	R-CT	[9.1] DPT_Value_Temp	2 Bytes
5	Total measured value for temperature	Output	R-CT	[9.1] DPT_Value_Temp	2 Bytes
6	Request min./max. temperature measured value	Input	-WC-	[1.17] DPT_Trigger	1 Bit
7	Minimum measured value for temperature	Output	R-CT	[9.1] DPT_Value_Temp	2 Bytes
8	Maximum measured value for temperature	Output	R-CT	[9.1] DPT_Value_Temp	2 Bytes
9	Reset min./max. measured value for temperature	Input	-WC-	[1.17] DPT_Trigger	1 Bit
10	Temp. thresholdV 1: Absolute value	Input / Output	RWCT	[9.1] DPT_Value_Temp	2 Bytes
11	Temp. thresholdV 1: (1:+ | 0:-)	Input	-WC-	[1.2] DPT_Bool	1 Bit
12	Temp. thresholdV 1: Switching delay from 0 to 1	Input	-WC-	[9.010] DPT_Value_Time	2 Bytes
13	Temp. thresholdV 1: Switching delay from 1 to 0	Input	-WC-	[9.010] DPT_Value_Time	2 Bytes
14	Temp. thresholdV 1: Switching output	Output	R-CT	[1.1] DPT_Switch	1 Bit

No	Name	Function	Flags	Data Point Type	Size
15	Temp. thresholdV 1: Switching output block	Input	-WC-	[1.2] DPT_Bool	1 Bit
16	Temp. thresholdV 2: Absolute value	Input / Output	RWCT	[9.1] DPT_Value_Temp	2 Bytes
17	Temp. thresholdV 2: (1:+ | 0:-)	Input	-WC-	[1.2] DPT_Bool	1 Bit
18	Temp. thresholdV 2: Switching delay from 0 to 1	Input	-WC-	[9.010] DPT_Value_Time	2 Bytes
19	Temp. thresholdV 2: Switching delay from 1 to 0	Input	-WC-	[9.010] DPT_Value_Time	2 Bytes
20	Temp. thresholdV 2: Switching output	Output	R-CT	[1.1] DPT_Switch	1 Bit
21	Temp. thresholdV 2: Switching output block	Input	-WC-	[1.2] DPT_Bool	1 Bit
22	Temp. thresholdV 3: Absolute value	Input / Output	RWCT	[9.1] DPT_Value_Temp	2 Bytes
23	Temp. thresholdV 3: (1:+ | 0:-)	Input	-WC-	[1.2] DPT_Bool	1 Bit
24	Temp. thresholdV 3: Switching delay from 0 to 1	Input	-WC-	[9.010] DPT_Value_Time	2 Bytes
25	Temp. thresholdV 3: Switching delay from 1 to 0	Input	-WC-	[9.010] DPT_Value_Time	2 Bytes
26	Temp. thresholdV 3: Switching output	Output	R-CT	[1.1] DPT_Switch	1 Bit
27	Temp. thresholdV 3: Switching output block	Input	-WC-	[1.2] DPT_Bool	1 Bit
29	Temp.control: HVAC mode (priority 1)	Input	-WC-	[20.102] DPT_HVACMode	1 Byte
30	Temp.control: HVAC mode (priority 2)	Input / Output	RWCT	[20.102] DPT_HVACMode	1 Byte
31	Temp.control: Mode frost/heat protection activt.	Input / Output	RWCT	[1.1] DPT_Switch	1 Bit
32	Temp.control: Block (On when value = 1)	Input	-WC-	[1.1] DPT_Switch	1 Bit
33	Temp.control: Current setpoint	Output	R-CT	[9.1] DPT_Value_Temp	2 Bytes
34	Temp.control: Switch. (Heating = 0 | Cooling = 1)	Input	-WC-	[1.1] DPT_Switch	1 Bit
35	Temp.control: Setpoint Comfort heating	Input / Output	RWCT	[9.1] DPT_Value_Temp	2 Bytes
36	Temp.control: Setpoint Comfort heat.(1:+ | 0:-)	Input	-WC-	[1.1] DPT_Switch	1 Bit
37	Temp.control: Setpoint Comfort cooling	Input / Output	RWCT	[9.1] DPT_Value_Temp	2 Bytes

No	Name	Function	Flags	Data Point Type	Size
38	Temp.control: Setpoint Comfort cool.(1:+ | 0:-)	Input	-WC-	[1.1] DPT_Switch	1 Bit
39	Temp.control: Basic 16-bit set-point shift	Input / Output	RWCT	[9.1] DPT_Value_Temp	2 Bytes
40	Temp.control: Setpoint Standby heating	Input / Output	RWCT	[9.1] DPT_Value_Temp	2 Bytes
41	Temp.control: Setpoint Standby heat.(1:+ | 0:-)	Input	-WC-	[1.1] DPT_Switch	1 Bit
42	Temp.control: Setpoint Standby cooling	Input / Output	RWCT	[9.1] DPT_Value_Temp	2 Bytes
43	Temp.control: Setpoint Standby cool. (1:+ | 0:-)	Input	-WC-	[1.1] DPT_Switch	1 Bit
44	Temp.control: Setpoint Eco heating	Input / Output	RWCT	[9.1] DPT_Value_Temp	2 Bytes
45	Temp.control: Setpoint Eco heating (1:+ | 0:-)	Input	-WC-	[1.1] DPT_Switch	1 Bit
46	Temp.control: Setpoint Eco cooling	Input / Output	RWCT	[9.1] DPT_-Value_Temp	2 Bytes
47	Temp.control: Setpoint Eco cooling (1:+ | 0:-)	Input	-WC-	[1.1] DPT_Switch	1 Bit
48	Temp.control: Control variable heating (level 1)	Output	R-CT	[5.1] DPT_Scaling	1 Byte
49	Temp.control: Control variable heating (level 2)	Output	R-CT	[5.1] DPT_Scaling	1 Byte
50	Temp.control: Control variable cooling (level 1)	Output	R-CT	[5.1] DPT_Scaling	1 Byte
51	Temp.control: Control variable cooling (level 2)	Output	R-CT	[5.1] DPT_Scaling	1 Byte
52	Temp.control: Status Heat. level 1 (1=ON|0=OFF)	Output	R-CT	[1.1] DPT_Switch	1 Bit
53	Temp.control: Status Heat. level 2 (1=ON|0=OFF)	Output	R-CT	[1.1] DPT_Switch	1 Bit
54	Temp.control: Status Cool. level 1 (1=ON|0=OFF)	Output	R-CT	[1.1] DPT_Switch	1 Bit
55	Temp.control: Status Cool. level 2 (1=ON|0=OFF)	Output	R-CT	[1.1] DPT_Switch	1 Bit
56	Temp.control: Comfort extension status	Input / Output	RWCT	[1.1] DPT_Switch	1 Bit
57	Temp.control: Comfort Extension time	Input	RWCT	[7.5] DPT_TimePeriodSec	2 Bytes
58	Temperature control: Variable for 4/6-way valve	Output	R-CT	[5.1] DPT_Scaling	1 Byte
131	CO2 control: Act. variable ventilation (1.stage)	Output	R-CT	[5.1] DPT_Scaling	1 Byte

No	Name	Function	Flags	Data Point Type	Size
133	CO2 control: Status ventilation (1=ON | 0=OFF)	Output	R-CT	[1.1] DPT_Switch	1 Bit
134	CO2 control: Status ventilation 2 (1=ON | 0=OFF)	Output	R-CT	[1.1] DPT_Switch	1 Bit
135	Actuating variable comparator 1: Input 1	Input	-WC-	[5.1] DPT_Scaling	1 Byte
136	Actuating variable comparator 1: Input 2	Input	-WC-	[5.1] DPT_Scaling	1 Byte
137	Actuating variable comparator 1: Input 3	Input	-WC-	[5.1] DPT_Scaling	1 Byte
138	Actuating variable comparator 1: Input 4	Input	-WC-	[5.1] DPT_Scaling	1 Byte
139	Actuating variable comparator 1: Input 5	Input	-WC-	[5.1] DPT_Scaling	1 Byte
140	Actuating variable comparator 1: Output	Output	R-CT	[5.1] DPT_Scaling	1 Byte
141	Actuating variable comparator 1: Block	Output	-WC-	[1.2] DPT_Bool	1 Bit
142	Actuating variable comparator 2: Input 1	Input	-WC-	[5.1] DPT_Scaling	1 Byte
143	Actuating variable comparator 2: Input 2	Input	-WC-	[5.1] DPT_Scaling	1 Byte
144	Actuating variable comparator 2: Input 3	Input	-WC-	[5.1] DPT_Scaling	1 Byte
145	Actuating variable comparator 2: Input 4	Input	-WC-	[5.1] DPT_Scaling	1 Byte
146	Actuating variable comparator 2: Input 5	Input	-WC-	[5.1] DPT_Scaling	1 Byte
147	Actuating variable comparator 2: Output	Output	R-CT	[5.1] DPT_Scaling	1 Byte
148	Actuating variable comparator 2: Block	Output	-WC-	[1.2] DPT_Bool	1 Bit
149	AND logic 1: 1 bit switching output	Output	R-CT	[1.1] DPT_Switch	1 Bit
150	AND logic 1: 8 bit output A	Output	R-CT	[5] 5.xxx	1 Byte
151	AND logic 1: 8 bit output B	Output	R-CT	[5] 5.xx	1 Byte
152	AND logic 1: Switching output block	Input	-WC-	[1.2] DPT_Bool	1 Bit
153	AND logic 2: 1 bit switching output	Output	R-CT	[1.1] DPT_Switch	1 Bit
154	AND logic 2: 8 bit output A	Output	R-CT	[5] 5.xxx	1 Byte

No	Name	Function	Flags	Data Point Type	Size
155	AND logic 2: 8 bit output B	Output	R-CT	[5] 5.xxx	1 Byte
156	AND logic 2: Switching output block	Input	-WC-	[1.2] DPT_Bool	1 Bit
157	AND logic 3: 1 bit switching output	Output	R-CT	[1.1] DPT_Switch	1 Bit
158	AND logic 3: 8 bit output A	Output	R-CT	[5] 5.xxx	1 Byte
159	AND logic 3: 8 bit output B	Output	R-CT	[5] 5.xxx	1 Byte
160	AND logic 3: Switching output block	Input	-WC-	[1.2] DPT_Bool	1 Bit
161	AND logic 4: 1 bit switching output	Output	R-CT	[1.1] DPT_Switch	1 Bit
162	AND logic 4: 8 bit output A	Output	R-CT	[5] 5.xxx	1 Byte
163	AND logic 4: 8 bit output B	Output	R-CT	[5] 5.xxx	1 Byte
164	AND logic 4: Switching output block	Input	-WC-	[1.2] DPT_Bool	1 Bit
181	OR logic 1: 1 bit switching output	Output	R-CT	[1.1] DPT_Switch	1 Bit
182	OR logic 1: 8 bit output A	Output	R-CT	[5] 5.xxx	1 Byte
183	OR logic 1: 8 bit output B	Output	R-CT	[5] 5.xxx	1 Byte
184	OR logic 1: Switching output block	Input	-WC-	[1.2] DPT_Bool	1 Bit
185	OR logic 2: 1 bit switching output	Output	R-CT	[1.1] DPT_Switch	1 Bit
186	OR logic 2: 8 bit output A	Output	R-CT	[5] 5.xxx	1 Byte
187	OR logic 2: 8 bit output B	Output	R-CT	[5] 5.xxx	1 Byte
188	OR logic 2: Switching output block	Input	-WC-	[1.2] DPT_Bool	1 Bit
189	OR logic 3: 1 bit switching output	Output	R-CT	[1.1] DPT_Switch	1 Bit
190	OR logic 3: 8 bit output A	Output	R-CT	[5] 5.xxx	1 Byte
191	OR logic 3: 8 bit output B	Output	R-CT	[5] 5.xxx	1 Byte
192	OR logic 3: Switching output block	Input	-WC-	[1.2] DPT_Bool	1 Bit

No	Name	Function	Flags	Data Point Type	Size
193	OR logic 4: 1 bit switching output	Output	R-CT	[1.1] DPT_Switch	1 Bit
194	OR logic 4: 8 bit output A	Output	R-CT	[5] 5.xxx	1 Byte
195	OR logic 4: 8 bit output B	Output	R-CT	[5] 5.xxx	1 Byte
196	OR logic 4: Switching output block	Input	-WC-	[1.2] DPT_Bool	1 Bit
200	Logic input 1	Input	-WC-	[1.2] DPT_Bool	1 Bit
201	Logic input 2	Input	-WC-	[1.2] DPT_Bool	1 Bit
202	Logic input 3	Input	-WC-	[1.2] DPT_Bool	1 Bit
203	Logic input 4	Input	-WC-	[1.2] DPT_Bool	1 Bit
204	Logic input 5	Input	-WC-	[1.2] DPT_Bool	1 Bit
205	Logic input 6	Input	-WC-	[1.2] DPT_Bool	1 Bit
206	Logic input 7	Input	-WC-	[1.2] DPT_Bool	1 Bit
207	Logic input 8	Input	-WC-	[1.2] DPT_Bool	1 Bit
208	Logic input 9	Input	-WC-	[1.2] DPT_Bool	1 Bit
209	Logic input 10	Input	-WC-	[1.2] DPT_Bool	1 Bit
210	Logic input 11	Input	-WC-	[1.2] DPT_Bool	1 Bit
211	Logic input 12	Input	-WC-	[1.2] DPT_Bool	1 Bit
212	Logic input 13	Input	-WC-	[1.2] DPT_Bool	1 Bit
213	Logic input 14	Input	-WC-	[1.2] DPT_Bool	1 Bit
214	Logic input 15	Input	-WC-	[1.2] DPT_Bool	1 Bit
215	Logic input 16	Input	-WC-	[1.2] DPT_Bool	1 Bit
220	Display contrast (1 = higher | 0 = lower)	Input	-WC-	[1.1] DPT_Switch	1 Bit
221	Display lighting (1 = on | 0 = off)	Input	-WC-	[1.1] DPT_Switch	1 Bit

No	Name	Function	Flags	Data Point Type	Size
222	Display lighting Brightness	Input	RWCT	[5.1] DPT_Scaling	1 Byte
223	Display lighting Switch off delay	Input	RWCT	[7.5] DPT_TimePeriodSec	2 Bytes
230	Date for display	Input	-WCT	[11.1] DPT_Date	3 Bytes
231	Time for display	Input	-WCT	[10.1] DPT_TimeOfDay	3 Bytes
232	8 bit object 1 for display	Input	-WC-	[5] 5.xxx	1 Byte
233	8 bit object 2 for display	Input	-WC-	[5] 5.xxx	1 Byte
234	8 bit object 3 for display	Input	-WC-	[5] 5.xxx	1 Byte
235	16 bit object 1 for display	Input	-WC-	[9] 9.xxx	2 Bytes
236	16 bit object 2 for display	Input	-WC-	[9] 9.xxx	2 Bytes
237	Text message 1 for display	Input	-WC-	[16.0] DPT_String_ASCII	14 Bytes
238	Text message 2 for display	Input	-WC-	[16.0] DPT_String_ASCII	14 Bytes
239	Back jump release for display	Input	-WC-	[1.1] DPT_Switch	1 Bit
240	Push button 1 long-term	Output	R-CT	[1.8] DPT_UpDown	1 Bit
241	Push button 1 short-term	Output	R-CT	[1.10] DPT_Start	1 Bit
242	Push button 1 switching	Output	R-CT	[1.1] DPT_Switch	1 Bit
243	Push button 1 dimming	Input / Output	RWCT	[3.7] DPT_Control_Dimming	4 Bit
244	Push button 1 encoder 8 bit	Output	R-CT	[5] 5.xxx	1 Byte
245	Push button 1 encoder 16 bit	Output	R-CT	[9] 9.xxx	2 Bytes
246	Push button 1 scene	Output	R-CT	[5] 5.xxx	1 Byte
247	Push button 2 long-term	Output	R-CT	[1.8] DPT_UpDown	1 Bit
248	Push button 2 short-term	Output	R-CT	[1.10] DPT_Start	1 Bit

No	Name	Function	Flags	Data Point Type	Size
249	Push button 2 switching	Output	R-CT	[1.1] DPT_Switch	1 Bit
250	Push button 2 dimming	Input / Output	RWCT	[3.7] DPT_Control_Dim- ming	4 Bit
251	Push button 2 encoder 8 bit	Output	R-CT	[5] 5.xxx	1 Byte
252	Push button 2 encoder 16 bit	Output	R-CT	[9] 9.xxx	2 Bytes
253	Push button 2 scene	Output	R-CT	[5] 5.xxx	1 Byte

5. Parameter setting

5.1. Behaviour on power failure/ restoration of power

Behaviour following a failure of the bus power supply:

The device sends nothing.

Behaviour on bus restoration of power and following programming or reset:

The device sends all outputs according to their send behaviour set in the parameters with the delays established in the "General settings" parameter block.

5.2. General settings

Set the basic data transfer characteristics and select whether or not malfunction objects should be sent.

Send delay after power-up and programming for:	
Measured values	<u>5 s</u> • ... • 2 h
Threshold values and switching outputs	<u>5 s</u> • ... • 2 h
Controller objects	5 s • <u>10 s</u> • ... • 2 h
Logic outputs	5 s • <u>10 s</u> • ... • 2 h
Maximum telegram quota	• 1 message per second • ... • <u>5 messages per second</u> • ... • 20 messages per second
Use temperature malfunction object	Yes • <u>No</u>

5.3.   Temperature value

Use **Offsets** to adjust the readings to be sent.

Offset in 0,1°C	-50…50; 0

The unit can calculate a **mixed value** from its own reading and an external value. Set the mixed value calculation if desired. If an external value is used, all of the following settings are referred to the total value.

Use external reading	Yes • No
Ext. Reading proportion of the total reading	5% • 10% • ... • 50% • ... • 100%
All of the following settings are referred to the total value.	
Send internal and total reading	• never • periodically • on change • on change and periodically
From change of *(if sent on change)*	0,1°C • 0,2°C • 0,5°C • ... • 5,0°C
Send cycle *(if sent periodically)*	5 s • 10 s • ... • 2 h

The **minimum and maximum readings** can be saved and sent to the bus. Use the „Reset temperature min/max. value" objects to reset the values to the current readings. The values are not retained after a reset.

Use minimum/maximum value	Yes • No

5.4.   Temperature threshold values

Activate the required temperature threshold values. The menus for setting the threshold values are displayed.

Use threshold value 1/2/3	Yes • No

5.4.1.   Threshold value 1, 2, 3

Threshold value

Set, in which cases **threshold values** received via object are to be retained. The parameter is only taken into consideration if the setting via object is activated below. Please note that the setting "After power supply restoration and programming" should not be used for the initial start-up, as the factory settings are always used until the first communication (setting via objects is ignored).

Set the threshold value directly in the application program using parameters, or define them via the bus using a communication object.

Threshold value setting via parameter:

Set the threshold values and hysteresis directly.

Threshold value setting via	**Parameter** • Communication objects
Threshold value in 0.1°C	-300 … 800; <u>200</u>

Threshold value setting via a communication object:

Define, how the threshold value is to be received from the bus. Basically, a new value can be received, or simply a command to increase or decrease.

During initial commissioning, a threshold value must be defined, which will be valid until the first communication with a new threshold value. For units which have already been taken into service, the last communicated threshold value can be used. Basically, a temperature range is given, in which the threshold value can be changed (object value limit).

A set threshold value will be retained until a new value or a change is transferred. The current value is saved, so that it is retained in the event of a power supply failure and will be available once the power supply is restored.

Threshold value setting via	Parameter • **Communication objects**
The value communicated last shall be maintained	• <u>never</u> • after power supply restoration • after power supply restoration and programming
Start threshold value in 0.1°C valid until first communication	-300 … 800; <u>200</u>
Object value limit (min) in 0.1°C	<u>-300</u>…800
Object value limit (max) in 0.1°C	-300…<u>800</u>
Type of threshold value change	Absolute value • Increase/decrease
Increment *(upon increase/decrease change)*	0,1 °C • ... • 5°C, <u>1°C</u>

Set the **hysteresis** independent of the type of threshold value specification.

Hysteresis in % of the threshold value	0 … 50; <u>20</u>

Switching output

Set the behaviour of the switching output when a threshold value is exceeded/undercut. The output switching delay can be set using objects or directly as a parameter.

When the following conditions apply, the output is (TV = Threshold value)	• <u>TV above = 1 | TV - hyst. below = 0</u> • TV above = 0 | TV - hyst. below = 1 • TV below = 1 |TV + hyst. above = 0 • TV below = 0 |TV + hyst. above = 1
Delays can be set via objects (in seconds)	<u>No</u> • Yes

Switching delay from 0 to 1 *(If delay can be set via objects: valid until 1st communication)*	None • 1 s • 2 s • 5 s • 10 s • ... • 2 h
Switching delay from 1 to 0 *(If delay can be set via objects: valid until 1st communication)*	None • 1 s • 2 s • 5 s • 10 s • ... • 2 h
Switching output sends	• on change • on change to 1 • on change to 0 • on change and periodically • on change to 1 and periodically • on change to 0 and periodically
Cycle *(only if sending periodically is selected)*	5 s • 10 s • 30 s... • 2 h

Block

The switching output can be blocked using an object.

Use switching output block	No • Yes

If the block is activated, define specifications here for the behaviour of the output when blocked.

Analysis of the blocking object	• At value 1: block	At value 0: release • At value 0: block	At value 1: release
Blocking object value before 1st communication	0 • 1
Behaviour of the switching output	
On block	• Do not send message • send 0 • send 1
On release (with 2 seconds release delay)	[Dependent on the "Switching output sends" setting]

The behaviour of the switching output on release is dependent on the value of the parameter "Switching output sends" (see "Switching output")

Switching output sends on change	• Do not send message • Send switching output status
Switching output sends on change to 1	• Do not send message • if switching output = 1 ➔ send 1
Switching output sends on change to 0	• Do not send message • if switching output = 0 ➔ send 0
Switching output sends on change and periodically	Send switching output status
Switching output sends on change to 1 and periodically	if switching output = 1 ➔ send 1
Switching output sends on change to 0 and periodically	if switching output = 0 ➔ send 0

5.5. Temperature PI control

Activate the control if you want to use it.

Use control	No • Yes

General control

Set, in which cases **setpoint values and extension time** received via object are to be retained. The parameter is only taken into consideration if the setting via object is activated below. Please note that the setting "After power supply restoration and pro-gramming" should not be used for the initial start-up, as the factory settings are always used until the 1st communication (setting via objects is ignored).

For an adequate regulation of the indoor temperature, comfort, standby, eco and building protection modes may be used.
Comfort when present,
Standby during short absences,
Eco as a night-time mode and
Frost/heat protection (building protection) during longer absences.

The settings for the temperature control include the set point temperatures for the individual modes. Objects are used to determine which mode is to be selected. A change of mode may be triggered manually or automatically (e.g. by a timer, window contact).

The **mode** may be switched with two 8 bit objects of different priority. Objects
„... HVAC mode (Prio 2)" for switching in everyday operation and
„... HVAC mode (Prio 1)" for central switching with higher priority.
The objects are coded as follows:
0 = Auto
1 = Comfort
2 = Standby
3 = Eco
4 = Building Protection

Alternatively, you can use three objects, with one object switching between eco and standby mode and the two others activating comfort mode and frost/heat protection mode respectively. The comfort object blocks the eco/standby object, and the frost/heat protection object has the highest priority. Objects
„... Mode (1: Eco, 0: Standby)",
„... comfort activation mode" and
„... frost/heat protection activation mode"

Switch mode via	• two 8 Bit objects (HVAC Modes) • three 1 bit objects

Select the **mode to be activated after reset** (e.g. power failure, reset of the line via the bus) (Default).
Then configure a temperature control **block** via the blocking object.

Mode after reset	• Comfort • Standby • Eco • Building protection
Behaviour of the blocking object with value	• 1 = Block | 0 = release • 0 = block | 1 = release
Blocking object value before 1st communication	0 • 1

Specify when the current **control variables** of the controller are to be **sent** to the bus. Periodic sending is safer, in case a message does not reach a recipient. You may also set up periodical monitoring by the actuator with this setting.

Send control variable	• on change • on change and periodically
from change (in % absolute)	1...10; 2
Cycle *(if sent periodically)*	5 s • ... • 5 min • ... • 2 h

The **status object** reports the current status of the control variables (0% = OFF, >0% = ON) and may for example be used for visualisation, or to switch off the heating pump as soon as the heating is switched off.

Send status objects	• on change • on change to 1 • on change to 0 • on change and periodically • on change to 1 and periodically • on change to 0 and periodically
Cycle *(if sent periodically)*	5 s • ... • 5 min • ... • 2 h

Then define the **type of control**. Heating and/or cooling may be controlled in two levels.

Type of control	• Single level heating • Dual-level heating • Single-level cooling • Dual-level cooling • Single-level heating + single-level cooling • Dual-level heating + single-level cooling • Dual-level heating + dual-level cooling

General set point values

You may enter separate set point values for each mode or use the comfort set point as a basic value.

If you are using the controls for both heating *and* cooling, you may also select the setting "separately with switching object". Systems used for cooling in the summer and for heating in the winter can thus be switched from one to the other.

If you are using the basic value, only the deviation from the comfort set point value is listed for the other modes (e. g., 2°C less for standby mode).

Preserve modified set points after mode change	No • <u>Yes</u>
Setting the nominal values	• <u>separate with switching object</u> • separate without switching object • with comfort set point as a basis

The grades for the set point changes is predefined. Modifications may only remain active temporarily (do not save) or remain saved even after voltage recovery (and programming). This also applies to a comfort extension.

Grading for set point changes (in 0.1 °C)	1… 50; <u>10</u>
Saving set point value(s)	not • <u>after voltage recovery</u> • after voltage recovery and programming

The control may be manually reset to comfort mode from eco, or night mode. This allows the user to maintain the daily nominal value for a longer time, e.g. when having guests. The duration of this comfort extension period is set. After the comfort extension period is terminated, the system returns to eco mode.

Comfort extension time in seconds (can only be activated from eco mode)	1…36000; <u>3600</u>

Set point Comfort

Comfort mode is usually used for daytime mode when people are present. A starting value is defined for the comfort set point as well as a temperature range in which the nominal value may be modified.

Initial heating/cooling set point (in 0.1 °C) valid till 1st communication *not upon saving the set point value after* *programming*	-300…800; <u>210</u>

If set point values are entered separately:

Min. object value heating/cooling (in 0.1 °C)	-300…800; <u>160</u>
Max. object value heating/cooling (in 0.1 °C)	-300…800; <u>280</u>

If the comfort setpoint value is used as a basis:

If the comfort setpoint value is used as a basis, the reduction/increment of the value is set.

Starting heating/cooling setpoint (in 0.1 °C) valid until 1st communication	-300…800; <u>210</u>
Minimum base setpoint (in 0.1°C)	-300…800; <u>160</u>
Maximum base setpoint (in 0.1°C)	-300…800; <u>280</u>
Reduction by up to (in 0.1°C)	1…100; <u>50</u>
Increase by up to (in 0.1°C)	1…100; <u>50</u>

If the comfort setpoint is used as the basis without a switching object, a dead zone is specified for the control mode "heating *and* cooling" to avoid direct switching from heating to cooling.

Dead zone between heating and cooling in 0,1°C *(only if both heating AND cooling are used)*	1…100; <u>50</u>

Standby setpoint

Standby mode is usually used for daytime mode when people are absent.

If setpoint values are entered separately:

A starting setpoint value is defined as well as a temperature range in which the setpoint value may be changed.

Starting heating setpoint (in 0.1 °C) valid until 1st communication	-300…800; <u>180</u>
Starting heating setpoint (in 0.1 °C) valid until 1st communication	-300…800; <u>240</u>
Min. object value heating/cooling (in 0.1 °C)	-300…800; <u>160</u>
Max. object value heating/cooling (in 0.1 °C)	-300…800; <u>280</u>

If the comfort setpoint value is used as a basis:

If the comfort setpoint value is used as a basis, the reduction/increment of the value is set.

Reduce heating setpoint (in 0.1°C) *(for heating)*	0…200; <u>30</u>
Increase cooling setpoint (in 0.1°C) *(for cooling)*	0…200; <u>30</u>

Eco setpoint

Eco mode is usually used for night mode.

If setpoint values are entered separately:

A starting setpoint value is defined as well as a temperature range in which the setpoint value may be changed.

Starting heating setpoint (in 0.1 °C) valid until 1st communication	-300…800; <u>160</u>
Starting cooling setpoint (in 0.1 °C) valid until 1st communication	-300…800; <u>280</u>
Min. object value heating/cooling (in 0.1 °C)	-300…800; <u>160</u>
Max. object value heating/cooling (in 0.1 °C)	-300…800; <u>280</u>

If the comfort setpoint value is used as a basis:

If the comfort setpoint value is used as a basis, the reduction/increment of the value is set.

Reduce heating setpoint (in 0.1°C) *(for heating)*	0…200; <u>50</u>
Increase cooling setpoint (in 0.1°C) *(for cooling)*	0…200; <u>60</u>

Setpoint values for frost/heat protection (building protection)

The building protection mode is for example used as long as windows are opened for ventilation. Setpoints for frost protection (heating) and heat protection (cooling) are determined which may not be modified from outside (no access via operating devices etc.). The building protection mode may be activated with delay, which allows you to leave the building before the controls switch to frost/heat protection mode.

Setpoint frost protection (in 0.1°C)	-300…800; <u>70</u>
Activation delay	less than • 5 s • … • <u>5 min</u> • … • 2 h
Setpoint heat protection (in 0.1°C)	-300…800; <u>350</u>
Activation delay	none • 5 s • … • <u>5 min</u> • … • 2 h

General control variables

This setting appears for the control types "Heating *and* Cooling" only. Here, you can decide whether to use a common control variable for heating and cooling. If the 2nd level has a common control variable, you also determine the control mode of the 2nd level here.

For heating and cooling	• <u>separate control variables are used</u> • common control variables are used for Level 1 • common control variables are used for Level 2 • common control variable are used for Level 1+2

Use control variable for 4/6-way valve *(only for common control variables in level 1)*	No • Yes
Control type *(for level 2 only)*	• 2-point-control • PI control
Control variable of the 2nd Level is on *(only for level 2 with 2 point controlling)*	• 1 bit object • 8 bit object

When using the control variable for a 4/6 way valve, the following applies:
0%...100% heating = 66%...100% control variable
OFF = 50% control variable
0%...100% cooling = 33%...0% control variable

5.5.1. Heating control level 1/2

If a heating control mode is configured, one or two setting sections for the heating levels are displayed.

In the 1st level, heating is controlled by a PI control, which allows to either enter control parameters or select predetermined applications.

In the 2nd level (therefore only in case of 2-level heating), heating is controlled via a PI or a 2-point-control.
In level 2, the setpoint difference between the two levels must also be specified, i.e. below which setpoint deviation the second level is added.

Setpoint difference between 1st and 2nd level (in 0.1°C) *(for level 2)*	0...100; 40
Control type *(for level 2, no common control variables)*	• 2-point-control • PI control
Control variable is a *(for level 2 with 2-point controlling, no common control variables)*	• 1 bit object • 8 bit object

PI control with control parameters:

This setting allows individual input of the parameters for PI control.

Control type	**• PI control**
Setting of the controller by	**• Controller parameter** • specified applications

Specify the deviation from the setpoint value at which the maximum control variable value is reached, i.e. the point at which maximum heating power is activated.
The reset time shows how quickly the controller responds to deviations from the setpoint value. In case of a short reset time, the control responds with a fast increase of the control variable. In case of a long reset time, the control responds somewhat less

urgently and needs longer until the necessary control variable for the setpoint value deviation is reached.

You should set the time appropriate to the heating system at this point (observe manufacturer's instructions).

Maximum control variable is reached at setpoint/actual difference of (in °C)	1...<u>5</u>
Reset time (in min.)	1...255; <u>30</u>

Now specify what should be sent when the control is blocked. Set a value greater 0 (=OFF) to receive a basic heating level, e.g. for floor heating.

On release, the control variable follows the rule again.

When blocked, the control variable shall	• <u>not be sent</u> • send a specific value
Value (in %) *(if a value is sent)*	<u>0</u>...100

In case of a common control variable for heating and cooling, 0 is always transmitted as a fixed value.

PI control with predetermined application:

This setting provides fixed parameters for frequent applications.

Control type	• **PI control**
Setting of the controller by	• Controller parameter • **specified applications**
Application	• Warm water heating • Floor heating • Convection unit • Electric heating
Maximum control variable is reached at setpoint/actual difference of (in °C)	Warm water heating: 5 Floor heating: 5 Convection unit: 4 Electric heating: 4
Reset time (in min.)	Warm water heating: 150 Floor heating: 240 Convection unit: 90 Electric heating: 100

Now specify what should be sent when the control is blocked. Set a value greater 0 (=OFF) to receive a basic heating level, e.g. for floor heating.

On release, the control variable follows the rule again.

When blocked, the control variable shall	• not be sent • send a specific value
Value (in %) *(if a value is sent)*	<u>0</u>...100

In case of a common control variable for heating and cooling, 0 is always transmitted as a fixed value.

2-point-control (only level 2):

2-point-control is used for systems which are only set to ON or OFF.

Control type *(is determined at a higher level for com-mon control variables)*	• **2-point-control**

Enter the hysteresis that prevents frequent on/off switching of temperatures in the threshold range.

Hysteresis (in 0.1°C)	0...100; <u>20</u>

If separate control variables are used, select whether the control variable of the 2nd level is a 1 bit object (on/off) or an 8 bit object (on with percentage/off).

Control variable is a	• <u>1 bit object</u> • 8 bit object
Value (in %) *(for 8 bit object)*	0...<u>100</u>

Now specify what should be sent when the control is blocked. Set a value greater 0 (=OFF) to receive a basic heating level, e.g. for floor heating. On release, the control variable follows the rule again.

When blocked, the control variable shall	• not be sent • send a specific value
Value (in %) *only if a value is sent*	<u>0</u>...100

5.5.2. Cooling control level 1/2

If a cooling control mode is configured, one or two setting sections for the cooling levels are displayed.

In the 1st level, cooling is controlled by a PI control in which either control parameters can be entered or predetermined applications can be selected.

In the 2nd level (therefore only for 2-level cooling), cooling is controlled via a PI or a 2-point-control.
In level 2, the setpoint deviation between the two levels must also be specified, i.e. above which setpoint value deviation the second level is added.

Setpoint difference between 1st and 2nd level (in 0.1°C) *(for level 2)*	0...100; <u>40</u>
Control type *(for level 2, no common control variables)*	• 2-point-control • PI control
Control variable is a *(for level 2 with 2-point controlling, no common control variables)*	• <u>1 bit object</u> • 8 bit object

PI control with control parameters:

This setting allows individual input of the parameters for PI control.

Control type	• **PI control**
Setting of the controller by	• **Controller parameter** • specified applications

Specify the deviation from the setpoint value which reaches maximum variable value, i.e. the point at which maximum cooling power is activated.

The reset time shows how quickly the controller responds to deviations from the setpoint value. In case of a short reset time, the control responds with a fast increase of the control variable. In case of a long reset time, the control responds somewhat less urgently and needs longer until the necessary control variable for the setpoint value deviation is reached. You should set the time appropriate to the cooling system at this point (observe manufacturer's instructions).

Maximum control variable is reached at setpoint/actual difference of (in °C)	1...<u>5</u>
Reset time (in min.)	1...255; <u>30</u>

Now specify what should be sent when the control is blocked.
On release, the control variable follows the rule again.

When blocked, the control variable shall	• <u>not be sent</u> • send a specific value
Value (in %) *(if a value is sent)*	<u>0</u>...100

In case of a common control variable for heating and cooling, 0 is always transmitted as a fixed value.

PI control with predetermined application:

This setting provides fixed parameters for a cooling ceiling

Control type	• **PI control**
Setting of the controller by	• Controller parameter • **specified applications**
Application	• Cooling ceiling
Maximum control variable is reached at setpoint/actual difference of (in °C)	Cooling ceiling: 5
Reset time (in min.)	Cooling ceiling: 30

Now specify what should be sent when the control is blocked.
On release, the control variable follows the rule again.

When blocked, the control variable shall	• not be sent • send a specific value
Value (in %) *(if a value is sent)*	<u>0</u>...100

2-point-control (only level 2):

2-point-control is used for systems which are only set to ON or OFF.

Control type *is determined at a higher level for common variables*	• **2-point-control**

Enter the hysteresis that prevents frequent on/off switching of temperatures in the threshold range.

Hysteresis (in 0.1°C)	0...100; <u>20</u>

If separate control variables are used, select whether the control variable of the 2nd level is a 1 bit object (on/off) or an 8 bit object (on with percentage/off).

Control variable is a	• <u>1 bit object</u> • 8 bit object
Value (in %) *(for 8 bit object)*	0...<u>100</u>

Now specify what should be sent when the control is blocked.
On release, the control variable follows the rule again.

When blocked, the control variable shall	• <u>not be sent</u> • send a specific value
Value (in %) *(if a value is sent)*	0...100

In case of a common control variable for heating and cooling, 0 is always transmitted as a fixed value.

5.6. Variable comparator

The two integrated control variable comparators can output maximum, minimum and median values.

Use comparator 1/2	<u>No</u> • Yes

5.6.1. Control variable comparator 1/2

Determine what the control variable comparator should output, and activate the input objects to be used. Send behaviour and blocks can also be set.

Output delivered	• Maximum value • Minimum value • <u>Average value</u>
Use input 1/2/3/4/5	<u>No</u> • Yes
Output sends	• <u>on change of output</u> • on change of output and periodically • when receiving an input object • when receiving an input object and periodically
From change of *(is only sent if "on change" is selected)*	<u>1%</u> • 2% • 5% • 10% • 20% • 25%

Send cycle *(is only sent if "periodically" is selected)*	5 s • 10 s • 30 s • ... • <u>5 min</u> • ... • 2 h
Analysis of the blocking object	• <u>at value 1: block | at value 0: release</u> • at value 0: block | at value 1: release
Blocking object value before 1st communication	<u>0</u> • 1
Behaviour of the switching output	
With blocking	• <u>do not send message</u> • Send value
Sent value in %	0 ... 100

5.7. Logic

The device has 16 logic inputs, four AND- and four OR-logic gates.

Activate the logic inputs and assign object values up to 1st communication. Then, activate the required logic outputs.

Use logic inputs	Yes • <u>No</u>
Object value before 1st communication for	
- Logic input 1	<u>0</u> • 1
- Logic input ...	<u>0</u> • 1
- Logic input 16	<u>0</u> • 1

Activate the required logic outputs.

AND logic

AND logic 1	<u>not active</u> • active
AND logic ...	<u>not active</u> • active
AND logic 4	<u>not active</u> • active

OR logic

OR logic 1	<u>not active</u> • active
OR logic ...	<u>not active</u> • active
OR logic 4	<u>not active</u> • active

5.7.1. AND logic 1-4 and OR logic outputs 1-4

The same setting options are available for AND and OR logic.

Each logic output may transmit one 1 bit or two 8 bit objects. Determine what the output should send if logic = 1 and = 0.

1. / 2. / 3. / 4. Input	• <u>do not use</u>
	- Logic inputs 1...16
	- Logic inputs 1...16 inverted
	• all switching events that the device
	  provides (see *Connection inputs of the
	  AND/OR logic*)

Output type	• <u>a 1-Bit-object</u> • two 8-bit objects

If the **output type is a 1-bit object**, set the output values for the various conditions.

Output value if logic = 1	<u>1</u> • 0
Output value if logic = 0	1 • <u>0</u>

If the **output type is two 8-bit objects**, set the type of object and the output values for the various conditions.

Object type	• <u>Value (0…255)</u> • Percent (0…100%) • Angle (0…360°) • Scene call-up (0…127)
Output value object A if logic = 1	0 … 255 / 100% / 360° / 127; <u>1</u>
Output value object B if logic = 1	0 … 255 / 100% / 360° / 127; <u>1</u>
Output value object A if logic = 0	0 … 255 / 100% / 360° / 127; <u>0</u>
Output value object B if logic = 0	0 … 255 / 100% / 360° / 127; <u>0</u>

Set the output send pattern.

Send pattern	• <u>on change of logic</u> • on change of logic to 1 • on change of logic to 0 • on change of logic and periodically • on change of logic to 1 and periodically • on change of logic to 0 and periodically • on change of logic+object receipt • on change of logic+object receipt and periodically
Send cycle *(if sent periodically)*	5 s • <u>10 s</u> • ... • 2 h

Block

If necessary, activate the block for the logic output and set what a 1 or 0 at the block input means and what happens in the event of a block.

Analysis of the blocking object	• At value 1: block | At value 0: release • At value 0: block | At value 1: release
Blocking object value before first call	0 • 1
Behaviour of switching output	
On block	• Do not send message • Transmit block value [see above, Output value if blocking active]
On release (with 2 seconds release delay)	[send value for current logic status]

5.7.2. Connection inputs of the AND logic

do not use
Logic input 1
Logic input 1 inverted
Logic input 2
Logic input 2 inverted
Logic input 3
Logic input 3 inverted
Logic input 4
Logic input 4 inverted
Logic input 5
Logic input 5 inverted
Logic input 6
Logic input 6 inverted
Logic input 7
Logic input 7 inverted
Logic input 8
Logic input 8 inverted
Logic input 9
Logic input 9 inverted
Logic input 10
Logic input 10 inverted
Logic input 11
Logic input 11 inverted
Logic input 12
Logic input 12 inverted
Logic input 13
Logic input 13 inverted
Logic input 14
Logic input 14 inverted
Logic input 15
Logic input 15 inverted

Logic input 16
Logic input 16 inverted

Temperature sensor malfunction = ON
Temperature sensor malfunction = OFF

Switching output temperature 1
Switching output temperature 1 inverted
Switching output temperature 2
Switching output temperature 2 inverted
Switching output temperature 3
Switching output temperature 3 inverted
Comfort temperature controller active
Comfort temperature controller inactive
Eco temperature controller active
Eco temperature controller inactive
Standby temperature controller active
Standby temperature controller inactive
Temperatur controller frost/heat active
Temperatur controller frost/heat inactive
Temp. control status heating 1
Temp. control status heating 1 inverted
Temp. control status heating 2
Temp. control status heating 2 inverted
Temp. control status cooling 1
Temp. control status cooling 1 inverted
Temp. control status cooling 2
Temp. control status cooling 2 inverted
Switching output coolant temperature
Switching output coolant temperature inverted

5.7.3. Connection inputs of the OR logic

The OR logic connection inputs correspond to those of the AND logic. In addition the following inputs are available for the OR logic:

AND logic 1
AND logic output 1 inverted
AND logic output 2
AND logic output 2 inverted
AND logic output 3
AND logic output 3 inverted
AND logic output 4
AND logic output 4 inverted

5.8. Display

Adjust the display settings here.

Use display lighting	No • **Yes**
Brightness in % up to 1. Communication	0 ... 255; <u>100</u>
Lighting	<u>always on</u> • only when operating
Switch off delay after operation until 1st communication (in seconds)	1 ... 600; <u>10</u>
Saving brightness and switch off delay	• <u>never</u> • after power restoration • after power restoration and programming

Set contrast and number of lines, as well as the type of temperature target value display.

Use object "display contrast"	<u>No</u> • Yes
Display mode	• two lines (with optional thermostat display) • <u>three lines</u> (with optional thermostat display) • Permanent thermostat
Temperature controller display when using pushbutton	No • **Yes**
only possible if the pushbuttons are also set to "For temperature control")	
Type of temperature target value display *(only for active thermostat display)*	• <u>Current target value</u> • Basic setpoint • Basic setpoint as bar chart • Basic setpoint as bar chart with count • Basic setpoint as bar chart with range Basic setpoint as bar chart with range and count
Display duration in seconds for Temperature controller display	2...240; <u>5</u>

Choose if you would like to use the return release.

Use object "Return approval"	No • **Yes**
Object evaluation	• <u>1= Allow return | 0=Return not allowed</u> • 1= Allow return | 0=Return not allowed
Object value prior to initial communication	0 • <u>1</u>

Choose if input objects should be used.

Use input objects	<u>No</u> • Yes

Set what should appear on the display.

Content line 1 (small font size)	• <u>display nothing</u> • internal temperature • other selection options

Content line 2 (large font size)	• <u>internal temperature</u> • other selection options

Content line 3 (small font size)	• <u>display nothing</u> • other selection options

The following table contains a list of other selection options.

External temperature Total temperature Current thermostat target value Time	
8-bit object value 1 8-bit object value 2 8-bit object value 3	• <u>without [0 ... 255]</u> • percentage [0% ... 100%] • degree [0° ... 360°]
16-bit object value 1 16-bit object value 2 (Not for line 2!)	• <u>without</u> • °C (degree Celsius) • lux • m/s (metres per second) • Pa (Pascal) • bar • mbar (millibar) • % R.H. (% relative humidity) • ppm (parts per million) • s (second) • ms (millisecond) • v (volt) • mV (millivolt) • A (ampere) • mA (milliampere) • W (watt) • mW (milliwatt) • W/m^2 (watt per square meter) • W/h (watt per hour) • ltr (litre) • ltr/h (litre per hour) • m (meter) • mm (millimetre)
Text message 1 Text message 2 (Not for line 2!)	Display duration of the message: • <u>until new notification available</u> • max. 1 minute • ... • max. 60 minutes

5.9.   Pushbutton

Adjust the pushbutton settings here.

5.9.1.   Pushbutton for temperature control

Use pushbutton	• as button interface • <u>for temperature control</u>
Pushbutton functions	Left button (short) --> target temperature down Right button (short) --> target temperature up Left button (longer than 2 sec) --> mode switch Right button (longer than 2 sec) --> mode switch If both buttons are pressed in eco mode for more than 2 seconds, comfort mode is activated for the set duration.
The following modes can be selected by pushbutton:	
Comfort	No • <u>Yes</u>
Standby	No • <u>Yes</u>
Eco	No • <u>Yes</u>
Building protection	<u>No</u> • Yes

5.9.2.   Pushbutton interface

Choose if you would like to use the button as a button interface, and set the function.

Use pushbutton interface	<u>No</u> • Yes
Function	• <u>Switch</u> • Changeover switch • Shutter • Roller blind • Awning • Window • Dimmer • 8-bit encoder • 16-bit encoder • Scenario recall

Define which values are sent when the button is pressed/released, and when these are sent.

Command when pressing the pushbutton	• send 0 • send 1 • <u>do not send message</u>
Command when releasing the pushbutton	• send 0 • send 1 • <u>do not send message</u>

Send value	• on change • on change to 1 • on change to 0 • on change and periodically • on change to 1 and periodically • on change to 0 and periodically
Cycle (*if sent periodically*)	5 s • ... • 1 min • ... • 2 h

Changeover switching

Command when pressing the pushbutton	• Changeover switching • do not send message
Command when releasing the pushbutton	• Changeover switching • do not send message

Blind

Pushbutton function	• Up • Down
Control mode	• Standard • Standard inverted • Comfort mode • Dead man's switch

Standard:

Behaviour for button actuation (up): short = Stop/Step | long = Up Behaviour for button actuation (down): short = Stop/Step | long = Down	
Time between short and long in 0.1 seconds	0 ... 50; 10

Standard inverted:

Behaviour for button actuation (up): long = Stop/Step | short = Up Behaviour for button actuation (down): short = Stop/Step | long = Down	
Time between short and long in 0.1 seconds	0 ... 50; 10
Repeat the step command for a long button press	every 0.1 s • every 2 sec; every 0.5 sec

Comfort mode:

Button is pushed and	
released before time 1 expired held longer than time 1 released between time 1 and 1-2 released after time 1 +2	stop/step Up or Down Stop no more stop
Time 1 (in 0,1 s)	0 ... 50; 4
Time 2 (in 0,1 s)	0 ... 50; 20

Dead man's switch:

Push button	down command
Release button	up command

Shutter

Pushbutton function	• <u>Up</u> • Down • Up/Down
Control mode	• <u>Standard</u> • Standard inverted • Comfort mode • Dead man's switch

Standard:

Behaviour for button actuation (up): short = Stop | long = Up Behaviour for button actuation (down): short = Stop | long = Down Behaviour in case of button actuation (up/down): short = Stop | long = Up/Down	
Time between short and long in 0.1 seconds	0 ... 50; <u>10</u>

Standard inverted:

Behaviour for button actuation (up): long = Stop | short = Up Behaviour for button actuation (down): short = Stop | long = Down Behaviour in case of button actuation (up/down): short = Stop | long = Up/Down	
Time between short and long in 0.1 seconds	0 ... 50; <u>10</u>
Repeat the step command for a long button press (only Up)	no • every 0,1 s • ... • <u>every 0,5 s</u> • ... • every 2 s

Comfort mode:

Button is pushed and	
released before time 1 expired held longer than time 1 released between time 1 and 1-2 released after time 1 +2	Stopp Up | Down | Up/Down Stop no more stop
Time 1 (in 0,1 s)	0 ... 50; <u>4</u>
Time 2 (in 0,1 s)	0 ... 50; <u>20</u>

Dead man's switch:

Push button	Up- | Down- | Up/Down command
Release button	Stop command

Awning

Pushbutton function	• <u>On</u> • Off • On/Off
Control mode	• <u>Standard</u> • Standard inverted • Comfort mode • Dead man's switch

Standard:

Behaviour in case of button actuation (retract): short = Stop | long = Retract Behaviour in case of button actuation (extend): short = Stop | long = Extend Behaviour in case of button actuation (retract/extend): short = Stop | long = Retract/Extend	
Time between short and long in 0.1 seconds	0 ... 50; <u>10</u>

Standard inverted:

Behaviour in case of button actuation (retract): long = Stop | short = Retract Behaviour in case of button actuation (extend): long = Stop | short = Extend Behaviour in case of button actuation (retract/extend): long = Stop | short = Retract/Extend	
Time between short and long in 0.1 seconds	0 ... 50; <u>10</u>
Repeat the step command for a long button press (only Up)	no • every 0,1 s • ... • <u>every 0,5 s</u> • ... • every 2 s

Comfort mode:

Button is pushed and	
released before time 1 expired held longer than time 1 released between time 1 and 1-2 released after time 1 +2	Stop On | Off | On/Off Stop no more stop
Time 1 (in 0,1 s)	0 ... 50; <u>4</u>
Time 2 (in 0,1 s)	0 ... 50; <u>20</u>

Dead man's switch:

Push button	On- | Off- | On/Off command
Release button	Stop command

Window

Pushbutton function	• <u>Close</u> • Open • Open/Close
Control mode	• <u>Standard</u> • Standard inverted • Comfort mode • Dead man's switch

Standard:

Behaviour in case of button actuation (close): short = Stop | long = Close Behaviour for button actuation (up): short = Stop | long = Up Behaviour in case of button actuation (open/close): short = Stop | long = Open/Close	
Time between short and long in 0.1 seconds	0 ... 50; <u>10</u>

Standard inverted:

Behaviour in case of button actuation (close): long = Stop | short = Close Behaviour for button actuation (up): long = Stop | short = Up Behaviour in case of button actuation (open/close) long = Stop | short = Open/Close	
Time between short and long in 0.1 seconds	0 ... 50; <u>10</u>
Repeat the step command for a long button press (only Up)	no • every 0,1 s • ... • <u>every 0,5 s</u> • ... • every 2 s

Comfort mode:

Button is pushed and	
released before time 1 expired held longer than time 1 released between time 1 and 1-2 released after time 1 +2	stop/step Up or Down Stop no more stop
Time 1 (in 0,1 s)	0 ... 50; <u>4</u>
Time 2 (in 0,1 s)	0 ... 50; <u>20</u>

Dead man's switch:

Push button	Close- | Up- | Open/Close command
Release button	Stop command

Dimmer

Pushbutton function	• <u>Brighter</u> • darker • Brighter/darker
Time between switching and dimming in 0.1 seconds	0 ... 50; 5
Repetition of the dimming command	<u>No</u> • **Yes**
Repetition of the dimming command upon extended button actuation	every 0,1 s • ... • <u>every 0,5 s</u> • ... • every 2 s
Dimming by	100% • ... • <u>6%</u> • ... • 1,5%

8 bit encoder:

Value range	• <u>0 ... 255</u> • 0% ... 100% • 0° ... 360°
Value	• <u>0</u>... 255 • <u>0</u> ... 100 • <u>0°</u>... 360°

16 bit encoder:

Value in 0.1	-6707600 ... 6707600; 0

Scenario control:

Scenario no.	0 ... 127